1991

1991-1993 Southern Illinois University Bulletin Carbondale Campus (Graduate Catalog)

Southern Illinois University Carbondale

ıthern Illinois University
Carbondale

Bulletin

1991–1993 Graduate Catalog

SIU

Quick Index

Graduate School Phone 618-536-7791

SIUC complies fully with applicable federal and state nondiscrimination and equal opportunity laws, orders, and regulations in admission, employment, and access to University programs and activities. Complaints or requests for further information should be directed to the University Affirmative Action Office, Anthony Hall 104, 536-6618.

SIUC is committed to creating and maintaining a university community free from all forms of sexual harassment. Copies of the "Sexual Harassment Policy and Grievance Procedures" are available in the University Affirmative Action Office. Problems should be reported promptly to the University Ombudsman, Woody Hall C302 or to the University Affirmative Action Office, Anthony Hall 104.

This publication provides information about Southern Illinois University at Carbondale. Primary attention is given to its academic programs, rules and regulations, and procedures. Students will be subject to the published requirements in effect when they are admitted to the Graduate School. Students beginning graduate work during the period of time from the start of summer session 1991 through spring semester 1993 are subject to the academic requirements of the Graduate School as specified in this publication. These requirements may be superseded by future publications of the Graduate Catalog. If the requirements are subsequently changed, students may elect either to meet the requirements in force in their particular degree programs immediately prior to the change, or to meet the new requirements. If they elect the former option they shall be guaranteed a minimum period of time from the date that the program requirements were changed within which minimum period they will be permitted to complete the old degree requirements.

This minimum period shall be determined by the department or other degree-program unit, subject to the following two constraints. First, the minimum period prescribed by the department may not exceed the standard Graduate School limitation that credit applied toward fulfillment of requirements for the master's degree must have been earned within a six-year period preceding the completion of the degree, and that doctoral students must complete degree requirements within five years after admission to candidacy. Second, the minimum period shall encompass no less than two years for master's degree students and three years for doctoral students, with the exception that students in the last stage of their degree work when requirements change (a master's student who has completed all requirements except the thesis or research report and the final examination or a doctoral student who has been admitted to Ph.D. candidacy) shall not be subject to the new requirements but may complete their degrees within the standard Graduate School limitations stated above. Students who elect to follow old requirements, but do not complete their work within the minimum period prescribed by the department, shall, unless they were in the last stage of their degree work when requirements changed, be subject to requirements in force at the time they complete their degrees, and shall be subject to the standard Graduate School limitations described above. The University reserves the right to change information contained herein on matters other than curricular requirements without notice when circumstances warrant such action.

Southern Illinois University at Carbondale

Bulletin

1991–1993 Graduate Catalog

Southern Illinois University at Carbondale Bulletin (USPS 506-080)

Volume 33 Number 1 June 1991

Second-class postage paid at Carbondale, Illinois 62901. Published by Southern Illinois University at Carbondale, Carbondale, Illinois 62901, four times per year, in June, July, August, and September.
POSTMASTER: Send address changes to Southern Illinois University at Carbondale Bulletin,
University Electronic Communications, Southern Illinois University at Carbondale, Carbondale, IL 62901.

This Catalog

The Graduate Catalog covers in detail questions concerning the graduate program of Southern Illinois University at Carbondale for the period from summer, 1991, through spring, 1993. It supersedes Volume 31, Number 1, of the *Southern Illinois University at Carbondale Bulletin*.

The following publications may be obtained free from University Electronic Communications, Southern Illinois University at Carbondale, Carbondale, Illinois 62901.

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University Calendar

All breaks officially begin at 10:00 o'clock the night before, and end at 7:30 the morning after, the respective beginning and ending dates listed unless otherwise designated.

Summer Session 1991

Eight-Week Session Begins	Monday, June 10, 7:30 A.M.
Deadline to Apply for Graduation	Friday, June 14
Deadline to Drop an Eight-Week Class and Receive a Refund	Friday, June 21
Independence Day Holiday	Thursday, July 4
Deadline to Drop a Class	Monday, July 8
Final Examinations	Thursday and Friday, August 1–2
Commencement	Saturday, August 3

Fall Semester 1991

Semester Classes Begin	Monday, August 19, 8:00 A.M.
Deadline to Apply for Graduation	Friday, August 23
Labor Day Holiday	Monday, September 2
Deadline to Drop a Class and Receive a Refund	Friday, September 6
Deadline to Drop a Class	Monday, October 14
Fall Vacation	Friday–Tuesday, November 1–5
Thanksgiving Vacation	Thursday–Sunday, November 28 –December 1
Final Examinations	Monday–Friday, December 9–13

Spring Semester 1992

Martin Luther King, Jr.'s Birthday Holiday	Monday, January 20
Semester Classes Begin	Tuesday, January 21, 8:00 A.M.
Deadline to Apply for Graduation	Friday, January 24
Deadline to Drop a Class and Receive a Refund	Friday, February 7
Deadline to Drop a Class	Friday, March 13
Spring Vacation	Saturday, 12:00 noon –Sunday, March 14–22
Final Examinations	Monday–Friday, May 11–15
Commencement	Saturday and Sunday, May 16–17

Summer Session 1992

Eight-Week Session Begins	Monday, June 15, 7:30 A.M.
Deadline to Apply for Graduation	Friday, June 19
Deadline to Drop an Eight-Week Class and Receive a Refund	Friday, June 26
Independence Day Holiday	Friday, July 3
Deadline to Drop a Class	Monday, July 13
Final Examinations	Thursday and Friday, August 6–7
Commencement	Saturday, August 8

Fall Semester 1992

Semester Classes Begin	Monday, August 24, 8:00 A.M.
Labor Day Holiday	Monday, September 7
Deadline to Apply for Graduation	Friday, August 24
Deadline to Drop a Class and Receive a Refund	Friday, September 11
Deadline to Drop a Class	Monday, October 19
Fall Vacation	Saturday, 12:00 noon –Tuesday, October 17–20
Thanksgiving Vacation	Wednesday–Sunday, November 25–29
Final Examinations	Monday–Friday, December 14–18

Spring Semester 1993

Martin Luther King, Jr.'s Birthday Holiday	Monday, January 18
Semester Classes Begin	Tuesday, January 19, 8:00 A.M.
Deadline to Apply for Graduation	Friday, January 22
Deadline to Drop a Class and Receive a Refund	Friday, February 5
Deadline to Drop a Class	Monday, March 15
Spring Vacation	Saturday, 12:00 noon –Sunday, March 13–21
Final Examinations	Monday–Friday, May 10–14
Commencement	Friday, Saturday, Sunday, May 14–16

Summer Session 1993 (tentative)

Eight-Week Session Begins	Monday, June 14, 7:30 A.M.
Independence Day Holiday	Monday, July 5
Final Examinations	Thursday and Friday, August 5–6
Commencement	Saturday, August 7

Fall Semester 1993 (tentative)

Semester Classes Begin	Monday, August 23, 8:00 A.M.
Labor Day Holiday	Monday, September 6
Fall Vacation	Saturday, 12:00 noon –Tuesday, October 16–19
Thanksgiving Vacation	Wednesday–Sunday, November 24–28
Final Examinations	Monday–Friday, December 13–17

Excused Absences for Religious Holidays. Students absent from classes because of required observances of major religious holidays will be excused. It is the student's responsibility to notify the instructor of each class that will be missed in advance of the absence. Students must also take the responsibility for making up work missed.

Deans of Colleges and Schools

James A. Tweedy, College of Agriculture, Agriculture Building
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Russell R. Dutcher, College of Science, Neckers Building
Elaine M. Vitello, College of Technical Careers, School of Technical Careers Building

1 The Graduate School

Southern Illinois University

Southern Illinois University has entered its second hundred years of teaching, research, and service. At the outset of the 1970's, Southern Illinois University became a single state system with two universities: Southern Illinois University at Carbondale and Southern Illinois University at Edwardsville. Southern Illinois University at Carbondale also has a medical school campus at Springfield.

Southern Illinois University at Carbondale (SIUC) first operated as a two-year normal school but in 1907 became a four-year, degree-granting institution. In 1943 SIUC was transformed from a teacher-training institution into a university, thus giving official recognition to the area's demand for diversified training and service. Graduate work was instituted in 1943, with the first doctoral degrees granted in 1959. There has been diversification and expansion of graduate programs across the University through the Colleges of Agriculture, Communications and Fine Arts, Education, Business and Administration, Liberal Arts, Science, and Engineering and Technology. In addition to expansion of programs within the Graduate School, professional schools were established in medicine and law in 1969.

In keeping with the state's master plan, the University's objective is to provide a comprehensive educational program meeting as many individual student needs as possible. While providing excellent instruction in a broad range of traditional programs, it also helps individual students design special programs when their interests are directed toward more individualized curricula. The University comprises a faculty and the facilities to offer general and professional training ranging from two-year associate degrees to doctoral programs, as well as certificate and nondegree programs meeting the needs of persons not interested in degree education.

Enrollment

In fall semester 1990, out of a total enrollment of 24,083, SIUC had 3,610 and 585 registered graduate and professional students respectively.

Location

Carbondale is approximately 100 miles southeast of St. Louis, Missouri. Immediately south of Carbondale begins some of the most rugged and picturesque terrain in Illinois. Sixty miles to the south is the historic confluence of the Ohio and Mississippi rivers, the two forming the border of the southern tip of Little Egypt, the fourteen southernmost counties in Illinois. Within ten miles of the campus are located two state parks and four recreational lakes and much of the area is a part of the 240,000 acre Shawnee National Forest.

Campus

The Carbondale campus, comprising more than 3,290 acres, has developed a 981 acre portion with woods and a lake as a site for its academic buildings and residence halls. The buildings are located in wooded tracts along two circular shaped campus drives, named for Lincoln and Douglas.

The Graduate School

The primary concerns of the Graduate School are graduate instruction and research. The Graduate School therefore plays an essential role in development of instructional and research programs, in acquisition of funds, and in procurement of facilities necessary to encourage and support research by members of its scholarly community. Through faculty, staff, and students the Graduate School makes its contribution to the public welfare of the region, state, nation, and international community.

The Graduate School offers master's degrees through sixty-two programs, the specialist degree in three areas, and the doctoral degree through twenty-five programs. Graduate students pursue advanced study and research under the leadership of a graduate faculty of over 1000 members. In addition, the Schools of Law and Medicine provide graduate students with additional opportunities in instruction and research. The Graduate School administers programs in the Colleges of Agriculture, Business and Administration, Communications and Fine Arts, Education, Engineering and Technology, Liberal Arts, Science, Technical Careers, and the Schools of Law and Medicine.

Within these colleges and schools are departments whose distinguished faculty offer inspired teaching, conduct innovative research, and facilitate student services from admission to placement. In addition to the excellent research conducted in the colleges and schools, SIUC operates a number of research centers, most of which have been established with the aid of outside funding. These centers are described below.

The Center of Archaeological Investigations: closely associated with the Department of Anthropology, the Center for Archaeological Investigations has research activities in the American Midwest and Southwest, Mexico, and the western Pacific. Funding is provided by state and federal agencies, and private institutions. The center also conducts archaeological research for firms and government agencies which are required to comply with environmental and antiquities laws. The center conducts an annual field school, provides thesis and dissertation data, and research opportunities for numerous students of archaeology. The center also curates a large collection, representing over 30 years of research.

Coal Extraction and Utilization Research Center (CEURC): the CEURC was established by the state of Illinois at SIUC in 1974 to stimulate and coordinate activities addressing the coal research needs of the state and nation. Over 100 SIUC faculty and 250 graduate students are now involved in this multidisciplinary effort involving both basic and applied research. The CEURC assists faculty in developing research in the following broad areas: coal science, coal conversion, coal preparation, coal utilization, mining, and reclamation. In addition, CEURC is involved with the management of several research and service-oriented activities. Prominent among these is the SIUC Coal Technology Laboratory, which focuses on developing technologies for desulfurizing bituminous coal. CEURC also administers the Illinois Mining and Mineral Resources Research Institute, a research and scholarship program, and the National Mine Land Reclamation Center, Midwest Region, a research and technology transfer program that addresses regional reclamation issues. In addition, the CEURC plays an important role in the Illinois Coal Development Board/Center for Research on

Sulfur in Coal program at SIUC. These activities exceed three million dollars in annual awards and make a significant contribution to SIUC's coal research, education, and service mission.

Cooperative Wildlife Research Laboratory: since its founding in 1951, the laboratory has achieved a distinguished record training graduate students in basic and applied principles of vertebrate ecology and wildlife biology. It is the only such comprehensive program in Illinois, and it is recognized as among the premier programs in the nation. Independent, cooperative, and collaborative research supported by industry, foundations, and state and federal agencies lead to better understanding and management of natural resources. The laboratory has pioneered in the reclamation and enhancement of mined lands for the benefit of various resources; and, the current efforts provide unique research and training opportunities. Other areas of acknowledged laboratory expertise include the biology and ecology of game, endangered, and nongame wildlife; aspects of land use and the impact on wildlife resources; avian physiological ecology, environmental toxicology, and the epizootiology of zoonotic and other diseases in wildlife. More than 20 projects directed by laboratory staff currently afford graduate fellows and research assistants broad and varied research opportunities. These activities exceed $500,000 each year in contracts and grants, resulting in significant contribution to academic needs of students and staff and requests for service by state, federal, and private agencies.

Cooperative Fisheries Research Laboratory: graduate research in fisheries is conducted through the Fisheries Research Laboratory. Graduate study in fisheries, culminating in the Master of Science, Master of Arts, or Doctor of Philosophy degree, is offered in the Department of Zoology. In addition to a wide variety of support courses, ten fisheries courses are taught. Research activities include studies in both fish management and aquaculture. Emphases include warmwater, coolwater, and coldwater fishes native to Illinois. There are also opportunities to work with exotic species of fishes and shellfishes, both freshwater and marine, particularly through the international fisheries program. Some of the areas of research stressed are trophic ecology, water quality, pond culture, tank culture, polyculture, culture system development, nutrition, fish physiology, fish genetics, utilization of nursery areas, introduction of forage fishes as a management tool, introduction of non-native sport fishes, ecology of larval fishes, age and growth studies, introduction of hybrid fish species, utilization of power plant cooling lakes, and population dynamics. Facilities in the Fisheries Research Laboratory include offices, well equipped laboratories, aquarium rooms, culture ponds, a greenhouse for hydroponic and recirculating water system studies and an 8,300 square-foot wet-laboratory building. A 100-pond research/demonstration facility is under construction.

Materials Technology Center: the Materials Technology Center was established as a part of a high-technology thrust by the state of Illinois for the purpose of promoting economic growth in the state by (1) stimulating traditional industries to develop and utilize new materials and advanced materials technology, and (2) attracting to Illinois high-technology industries that wish to develop and manufacture new materials and to create new techniques for using materials.

The Materials Technology Center was established in 1983 on the campus of SIUC as the direct result of a 1983 recommendation of the Governor's Commission on Science and Technology of the State of Illinois. It's function is to stimulate and coordinate research in the materials sciences carried out by the faculty of SIUC. A major goal is to use the results of the research to support industrial spin-offs and hence strengthen the economic posture of Southern Illinois and the region.

The major ongoing thrust involves composite materials research: carbon fiber investigations which involve pitch fiber spinning, modeling, microstructural

studies and precursor research; composites fabrication which includes process modeling, interfacial studies and characterization; property testing which includes investigations into creep, fracture, delamination and tribology; oxidation studies and the development of protective coatings for carbon-carbon composites. Smaller thrust areas involve the development of amorphous coatings for corrosion resistant metal structures, and investigations into high performance magnetic materials. The total program of the center provides an opportunity for the students and staff of SIUC to participate in a research experience of vital importance to the local region, the state, and the nation.

The Graduate School, as a part of SIUC, is fully accredited by the North Central Association of Colleges and Secondary Schools. Other accreditations and affiliations include:

Accreditation Board for Engineering and Technology, Inc.
Accredition Council of the American Assembly of Collegiate Schools of Business (undergraduate and master's level programs)
American Association for Accreditation of Laboratory Animal Care
American Association of Museums (University Museum)
American Bar Association
American Chemical Society
American Council on Education in Journalism and Mass Communication
American Dietetic Association
American Institute of Professional Geologists
American Psychological Association (Counseling and Clinical Psychology)
American Speech and Hearing Association by American Board of Examiners in Speech Pathology and Audiology
Association of American Law Schools
Association of Research Libraries
Commission on Accreditation of Rehabilitation Institutes (Evaluation Development Center)
Community Development Society
Council on Rehabilitation Education (Rehabilitation Counseling Program)
Council on Social Work Education
Federal Aviation Administration (Aviation Maintenance Technology, Aviation Flight, Avionics Technology, and the Airway Science Curriculum)
Illinois Office of Education
  Superintendent of Education
  State Board of Education
  State Teacher Certification Board
Liasion Committee on Medical Education of the American Medical Association and Association of American Medical Colleges
National Athletic Trainers Association
National Association of Schools of Art and Design
National Association of Schools of Music
National Association of Schools of Public Affairs and Administration
National Council for Accreditation of Teacher Education
National Recreation and Parks Association (National Accrediation Council)
Society of American Foresters
University Council for Vocational Education
Western Association of Schools and Colleges

Office of Research Development and Administration

The Office of Research Development and Administration (ORDA) is the University administrative unit primarily responsible for research administration and development. The functions of the office divide into two major categories. One is concerned with activities that are funded by federal, state, and local governments as well as by foundations, private industry, and other external funding

sources. The second major category is the internal research program which is supported with state funds.

The ORDA staff provides a number of services for faculty and students who desire to submit proposal applications to funding agencies. Included are a resource library which contains guidelines for the various funding sources, application forms, plus consultation and assistance in proposal and budget preparation. ORDA is also responsible for award negotiations, budget revisions, program adjustments, patents, licensing, and time extensions. ORDA has been designated to affix the final University signature on grants and contracts.

RESEARCH SHOPS AND SERVICES

To further assist faculty researchers, ORDA operates nine support service units for their use. The *Central Research Shop* is a facility which designs, repairs, and constructs special equipment. The *Research Photography and Illustrations Unit* offers consultation and technical assistance to those in need of scientific photography as an integral part of their research. The central animal facility or *Vivarium* is maintained under the direction of a veterinarian to insure proper and humane care and management of animals. The *Center for Electron Microscopy* houses two scanning and two transmission scopes, as well as other related equipment. The *Fine Instruments Research Shop* has two components: *electrical* and *mechanical*. This shop provides consultation, design, and fabrication of electronic and mechanical instruments. The *Glassblowing Research Shop* provides design and fabrication of glass apparatus. The *Research Machine Shop* provides design and fabrication of materials demanding medium and large machining capabilities. The *Amino Acid Analyzer* provides amino-acid analyses of samples of both physiological and hydrolysate nature. The *Fourier Transform-Nuclear Magnetic Resonance* (FT-NMR) facility provides NMR spectra from Varian VXR-500 and VXR-300 systems. The *Research Electronic Shop* provides consultation, design, fabrication, and repair of electronic equipment.

Associations

OAK RIDGE ASSOCIATED UNIVERSITIES

The University is a member of the Council of Sponsoring Institutions of Oak Ridge Associated Universities (ORAU), a not-for-profit consortium of 49 colleges and universities and a management and operating contractor for the U.S. Department of Energy with principal offices located in Oak Ridge, Tennessee. Founded in 1946, ORAU identifies and helps solve problems in science, engineering, technology, medicine, and human resources. ORAU conducts research and educational programs in energy, health, and the environment for DOE, ORAU's member institutions, other colleges and universities, and other private and governmental organizations.

ORAU manages competitive programs to bring students at all levels, precollege through postgraduate, as well as university and other faculty members, into federal and private research laboratories. Recipients of fellowships and research grants are selected by ORAU and the facilities in which appointments are served, which may include Oak Ridge National Laboratory; the Atmospheric Turbulence and Diffusion Division in Oak Ridge; Savannah River Laboratory and Savannah River Ecology Laboratory in Aiken, South Carolina; the Center for Energy and Environment Research in Rio Piedras and Mayaguez, Puerto Rico; the Morgantown, West Virginia, and Pittsburgh, Pennsylvania, Energy Technology Centers; the U.S. Bureau of Mines Pittsburgh Research Center; and the National Center for Toxicological Research at Jefferson, Arkansas.

Many programs in ORAU's Institute for Energy Analysis; Medical and Health Sciences Division; Manpower Education, Research, and Training Division; Special Projects Division; and University Isotope Separator at Oak Ridge (UNISOR) are also open to participation by qualified students and faculty members.

Of particular interest are short, specialized courses for scientists, engineers, educators, and students in nuclear-related fields developed and conducted by ORAU's professional training programs. For additional information, contact the Graduate School.

INTERNATIONAL BUSINESS INSTITUTE

The primary objective of the International Business Institute in the College of Business and Administration is to enhance the international dimension of the college's research and teaching missions.

In the research area, the institute focuses on encouraging research on current problems in all areas of international business. Further, links with foreign institutions are used to foster collaboration in research and data collection, and to offer seminars and workshops on topics related to international business research.

In teaching, the focus is on internationalizing the business curriculum and using links with foreign institutions to foster executive development programs in international business.

Facilities and Services

Morris Library

Morris Library contains over 2,000,000 volumes and subscribes to more than 12,000 current serials. In addition the library has an extensive collection of maps, manuscripts, rare books, government documents, phonograph records, and about 2,500,000 units of microform materials. The collection is arranged into four subject divisions (education/psychology, humanities, science, and social studies) as well as a separate Undergraduate Library. Special Collections consists of rare books, historical archives, and University archives. Among the many materials are important research collections in American and British expatriate literature, twentieth century philosophy, proletariat theatre, the Irish literary renaissance, and press freedom. Morris Library serves as a depository of federal, state, and U.N. documents. A major source for research in the behavioral and social sciences is the Human Relations Area files, consisting of copies of documents, books, articles, and manuscripts covering many world cultures. Supplementing the resources of Morris Library is the Center for Research Libraries (Chicago), in which the University holds membership. Morris Library is a member of ILLINET Online (IO), the state-wide library automated catalog, circulation, and interlibrary loan system. A computer-based interlibrary loan system serves to identify material in other libraries and to transmit requests for items. On-line computer-based bibliographic search capabilities using hundreds of data bases are available as are CD-ROM stations. Students and faculty may use and borrow library materials from the other state-supported universities in Illinois. A wide range of instructional development, research, and evaluation services, video, photographic and graphic production films and video materials, and related equipment is provided by Learning Resources Service. A separately housed law library may be used by the University community as well.

Computing Affairs

Computing Affairs operates a general purpose computing facility which provides related computer services and support to the University academic, research, and administrative communities. The academic and research needs of faculty and students are supported through a wide variety of systems, programming languages, and software packages; through on-line information and staff support pertinent to access procedures, operating guidelines, technical assistance, and

documentation; and through a program of periodic noncredit instruction in computing topics.

Facilities available include an IBM 3081-GX running VM/CMS and an IBM 3090-150E with vector processor running MVS. These systems have access to 48 and 64 megs of memory, 70 billion bytes on on-line disk, four tape reel units, six tape cartridge units, 4,000 line per minute print capacity, three 20 page per minute laser printers, and SNA 3270 communications network with over 2100 interactive devices, BITNET and NSFNet connections, and a campus area network based upon fiber optics in Phase I status. Special features of the computer learning centers are instructional laboratories equipped with 240 microcomputers and associated peripherals.

Placement Services of the University Placement Center

The University Placement Center provides services to students and alumni seeking job search assistance. Professional placement counselors are available to answer career related questions and to discuss placement procedures, job opportunities, resume writing, and interviewing techniques. The University Placement Center also works closely with employers in order to provide direct assistance in filling their job requirements. Inquiries concerning these services should be made to the University Placement Center office in Woody Hall B208, or by calling 453-2391.

Housing

Residence Halls. Double occupancy housing is available in residence halls for single graduate students. All contracts are for room and board and are offered on a first come, first served basis.

Inquiries regarding on-campus residence halls should be sent to the Supervisor of Contracts, University Housing, Southern Illinois University at Carbondale, Carbondale, IL 62901-6716.

Family Housing. SIUC operates two apartment complexes for graduate students, married couples, and students with families. Southern Hills, on the southeast edge of campus, has efficiency, one-bedroom, and two-bedroom furnished apartments. Evergreen Terrace, on the southwest edge of campus, has two- and three-bedroom unfurnished apartments. Priority for two- and three-bedroom apartments are given to families with children.

Sixteen, furnished efficiency apartments are available for single graduate students at Elizabeth Apartments, 800 South Elizabeth Street, on the west edge of campus.

Contracts are offered to eligible applicants based on the date of application. Inquiries regarding family housing apartments should be sent to Family Housing, Southern Illinois University at Carbondale, Carbondale, IL 62901-6716.

Off-Campus Housing. Many types of rental units are available in Carbondale, including apartments, rooming houses, and mobile homes. Many of the off-campus complexes are within walking distance of the campus. A personal visit prior to contracting with a facility is recommended.

A listing of apartment complexes and mobile home parks in the Carbondale area is available by contacting Off-Campus Housing, Southern Illinois University at Carbondale, Carbondale, IL 62901-6715.

Parking On Campus

Students wishing to operate or park a motor vehicle on campus must apply for a parking decal at the Parking Division located at Washington Square, Building D.

International Programs and Services

International Programs and Services is an administrative unit within the President's Office and reports to the Executive Assistant to the President for International and Economic Development. The unit is composed of three divisions: International Students and Scholars, International Development, and Study Abroad Programs. Community Programs, which represents the local, regional, and state outreach effort of the University in international affairs, is an important subdivision of the International Students and Scholars division.

International Students and Scholars

The International Students and Scholars division provides comprehensive programs and services for international students and scholars from pre-arrival correspondence to post-graduate concerns. These programs and services include processing of financial clearance for admission, serving as liaison with foreign governments and sponsoring agencies, providing certification for foreign currency exchange, and other needs. This office has been designated by the U.S. Immigration and Naturalization Service (INS) as having the official responsibility for interpretation and adherence to INS laws and regulations as they apply to non-immigrant students and faculty. Also designated responsible officers administer proper compliance with the USIA Exchange Visitor Program for the University. Assistance with INS regulations, forms, and procedures is provided to all non-immigrants related to University and broader community affairs.

Integral educative services include orientation programs, arrival and housing assistance, personal counseling and referral, a *Handbook for International Students and Faculty*, a newsletter (The International Dateline), advisement of international student associations, and a preparation for going home seminar.

Special programs which promote an international dimension of cross-cultural exchange to the broader community are provided. An annual International Festival and various national day celebrations are held. The Community Programs subdivision in cooperation with the International Friends Club coordinates a Host Family Program, International Speakers' Bureau, English in Action, Language Exchange, American and International Cooking Exchange, an International Spouses Group, and a Loan Closet.

The International Students and Scholars division is located at 910 S. Forest (618-453-5774).

International Development

The International Development division provides University-wide leadership, coordination, and support for a wide variety of developmental activities. These activities include research and dissemination of information, an international resource library, grants and projects, inter-institutional linkages, international visitors and protocol, and public relations. Assistance is provided in the exploration of ideas, identification of funding sources, proposal development, contract negotiations, campus coordination and follow-up activities.

The International Development division is located at 803 S. Oakland (618-453-7670).

Study Abroad Programs

The Study Abroad division coordinates services for American students and faculty, including international grant programs, exchanges, and study abroad programs. It is the central referral point for information on the student and faculty Fulbright programs and on the British Marshall, International Research and Exchanges Board (IREX), Belgian-American Educational Association, and Rhodes scholarships. Graduate students may also participate in inter-university

international exchange programs and in travel/study programs offered during the summer and intercession periods under the auspices of this division.

The Study Abroad Programs division is located at 803 S. Oakland (618-453-7670).

Student Health Program

The Student Medical Benefit (SMB) fees provide funding for an extensive health program. On-campus services include wellness programs, out-patient care, laboratory services, x-rays, pharmacy services, emergency dental services, and a sports medicine program. Off-campus benefits include emergency services, hospitalization, specialty care, and out-of-area benefits.

The Student Health Program is located in Beimfohr and Kesnar Halls and is open 8:00 A.M. to 4:30 P.M. Monday through Friday. Students in need of medical care when the Health Service is closed, may call the Dial-A-Nurse program, 536-5585 for health care advice. If an ambulance is required, students should call the Jackson County Ambulance Service at 618-684-5678.

Students who carry their own medical insurance or are covered under their parents' policy may be eligible for a refund of portions of the student medical benefit fee. Refunds of the fee are made on the basis of comparable or duplicate coverage for each area of service. Students who think they may qualify for a refund may apply no later than the end of the third week of each semester by contacting the Student Health Program's insurance department. When applying, students should provide a copy of their insurance policy.

Dependent coverage is also available. Details and prices for these policies are available and policies must be purchased in the first three weeks of the semester. Optional coverage for summer is available and must be purchased by Friday of the fourth week after spring semester graduation. Information is available from the Student Health Program's insurance department, Room 118 of Kesnar Hall, Small Group Housing (618-453-4413).

Effective July 1, 1989, the Illinois Department of Public Health (Public ACT 85-1315) requires all new students born after January 1, 1957, to present proof of immunizations to the University for diptheria, tetanus, measles, mumps, and rubella. Students who enroll on-campus shall present to the Student Health Program proof of immunity evidencing the following immunizations, UNLESS they are exempt from doing so as hereinafter provided:

IMMUNIZATION REQUIREMENTS

1. Diptheria, Tetanus
   a. Any combination of three or more doses of DPT, DT, or Td vaccine, with the most recent dose having been received within ten years prior to enrollment.
   b. The minimum time interval between the first and second dose must have been at least four weeks, with the third dose having been received at least six months after the second or last dose of the basic series.
   c. Receipt of Tetanus Toxoid (T.T.) vaccine is not acceptable in fulfilling this requirement.
2. Measles
   a. Immunization with live measles virus vaccine on or after the first birthday. If vaccine was received prior to 1968, proof must be provided that a live virus vaccine, without gamma globulin, was administered; or
   b. Laboratory (serologic) evidence of measles immunity; or
   c. A physician's signed confirmation of disease history and date of conclusive diagnosis.
3. Rubella
   a. Immunization with rubella vaccine on or after the first birthday; or
   b. Laboratory (serologic evidence of rubella immunity.

c. History of disease is not acceptable as proof of immunity.

4. Mumps
   a. Immunization with live mumps vaccine on or after the first birthday; or
   b. A physician's signed confirmation of disease history and date of conclusive diagnosis.
   c. Laboratory (serologic) evidence of mumps is not acceptable as proof of immunity.

PROOF OF IMMUNITY

1. Proof of immunity may be provided by a certificate of immunity containing the following information:
   a. The month, day, and year of vaccine receipt for measles, mumps, and rubella. Whole year dates (e.g. 1980) are acceptable only when it is clear that the student was at least twelve months of age when the vaccine was received.
   b. The month, day, and year of vaccine receipt for diptheria and tetanus.
2. Proof of immunity may also be provided by a copy of the student's Illinois high school health record which complies with the immunization requirements.

EXEMPTIONS

1. This policy does not apply to:
   a. Persons enrolled at the University on or before fall semester 1989;
   b. Persons born before January 1, 1957;
   c. Persons whose instruction solely involves research, field work, or study outside of a classroom environment.
2. Medical Exemption:
   a. No proof of immunization shall be required if a physician licensed to practice medicine in all of its branches, certifies that any immunization required herein is medically contraindicated.
3. Religious Exemption:
   a. No proof of immunization shall be required if the person or his or her parent(s) or guardian state, in writing, an objection to immunization on religious grounds.

A student to whom this requirement applies who enrolls without providing the required proof of immunity shall be precluded from enrolling in a subsequent term until such time as appropriate documentation is presented to the Student Health Program or until a medical or religious exemption is granted by the University.

These requirements are drafted in accordance with the College of Immunization Code promulgated by the State Department of Public Health. In the event that said code is changed and conflicts with these requirements, the code shall be controlling. If students have any questions concerning these requirements, they should contact the Student Health Program's immunization department at 618-453-4454.

Disabled Student Services

In order to be in compliance with Section 504, the University must ensure full and equal access for qualified students with disabilities. The office of Disabled Student Services offers a variety of services to assist faculty and students alike in making various accomodations to meet these federal mandates of accessibility.

Services and programs include, but are not necessarily limited to, pre-admission planning, orientation, adapted van transportation, wheelchair repair, adapted recreational opportunites, sign language interpreters, specialized materials and equipment, tutor/notetaker/reader/personal care assistant recruitment and referral, proctoring of academic examinations, accessible housing re-

ferral, parking, and liaison with agencies such as Illinois Department of Rehabilitation Services.

Prospective or newly admitted students should contact Disabled Student Services at 618-453-5738 for further information.

Women's Services

Women's Services, a component of the Counseling Center, is designed to meet the special needs of women from the University and the surrounding community. Staff members are available to provide information and support for women making educational, vocational, and personal decisions. Some of the services provided by Women's Services include resource and referral information, outreach workshops, seminars by request, and support and therapy groups for women. A newsletter is published several times throughout the semester which focuses on specific issues of interest to women living in today's changing world. In addition, a library is available which contains books, journals, and periodicals on topics that may assist individuals in their research and/or personal growth. Short term counseling is also available to the individual in need of support and assistance.

The Re-Entry program provides special supportive services to women returning to the University or beginning college for the first time after a period in the work force or at home. Women's Services aids in her transition to the University environment by offering information on child care, housing, financial aid, and other issues of concern to the returning student. Support groups and social activities are also made available to facilitate the student's success and growth in school.

Women's Services also houses the office of the Campus Safety Representative, who provides individual and group counseling to individuals who have experienced rape, sexual assault, sexual harassment. The office contains information about the University's Campus Safety Program, including women's self-defense classes, the Night Safety Vans, the Women's Transit Service, and the Brightway Path. Women's Services is an active component of the Program for Rape Education and Prevention (PREP), which provides prevention and awareness education to individuals, residence halls, classes, and groups upon request.

Women's Services is located in B-244 Woody Hall (618-453-3655). Walk-ins are always welcome.

The University Ombudsman

The University Ombudsman is an independent, impartial office reporting directly to the president. The office receives and acts on complaints and suggestions from aggrieved or concerned faculty, staff, and students. The office's role is to ensure that members of the University community receive fair and equitable treatment within the University system. This includes ensuring that decisions affecting individuals are made with reasonable promptness and that individuals receive due process, not only with respect to the adequacy of the procedures adopted to reach decisions but also with respect to the appropriateness of the criteria and rules on the basis of which decisions are reached.

The office helps individuals resolve their problems expeditiously. Assistance could include advising individuals on steps they may take to make their claims heard or have their questions answered; referring them to appropriate persons in the University; investigating claims of unfair treatment or erroneous procedures; engaging in mediation to obtain a fair settlement; and assisting in accessing University grievance mechanisms as a last resort. The Ombudsman will intervene in the bureaucratic process on behalf of individuals when such process unnecessarily or unfairly impinges upon them. The Ombudsman Office also brings to the attention of those in authority any gaps and inadequacies in exist-

ing University procedures that might jeopordize the human rights and civil liberties of members of the University community.

The Ombudsman has the right of access to official files as may be required to fulfill the functions of the office. The name of a person requesting help cannot be used in the investigation of a case without permission. The office's records, contacts, and communications are also confidential (618-453-2411).

Graduate Degrees Offered

The Graduate School offers the master's, Master of Fine Arts, specialist, Doctor of Philosophy, Doctor of Rehabilitation, and Doctor of Business Administration degrees. In several of the programs listed below, one or more concentrations are available.

Master's Degrees

Master's degrees are available in the approved programs listed below:

Abbreviations: Master of Accountancy, M.Acc.; Master of Arts, M.A.; Master of Business Administration, M.B.A.; Master of Music, M.M.; Master of Public Affairs, M.P.A.; Master of Science, M.S.; Master of Science in Education, M.S.; Master of Social Work, M.S.W.

- Accountancy ..... M.Acc.
  - Information Systems
  - Taxation
- Administration of Justice ..... M.S.
- Agribusiness Economics ..... M.S.
  - Agribusiness Economics
  - Agricultural Services
- Agricultural Education and Mechanization ..... M.S.
  - Agricultural Education
  - Agricultural Information
  - Agricultural Mechanization
- Animal Science ..... M.S.
- Anthropology ..... M.A.
  - Conservation Archaeology
- Applied Linguistics ..... M.A.
- Behavior Analysis and Therapy .. M.A., M.S.
- Biological Sciences ..... M.S.
- Business Administration ..... M.B.A.
  - Information Systems
  - International Business
- Chemistry ..... M.S.
- Civil Engineering ..... M.S.
- Communication Disorders and Sciences ..... M.S.
- Community Development ..... M.S.
- Computer Science ..... M.S.
- Curriculum and Instruction ..... M.S.Ed.
- Economics ..... M.A., M.S.
- Educational Administration ..... M.S.Ed.
  - Adult Education
  - Educational Administration
  - Instructional Supervision
- Educational Psychology ..... M.S.Ed.
  - Counselor Education
  - Educational Psychology
- Electrical Engineering ..... M.S.
- English ..... M.A.
  - Composition
- English as a Foreign Language ..... M.A.
- Foreign Languages and Literatures..... M.A.
  - French
  - German
  - Spanish
- Forestry ..... M.S.
  - Forest Resource Management
  - Outdoor Recreation Resource Management
  - Wood Science and Technology
- Geography ..... M.A., M.S.
  - Physical Environmental Systems
  - Resource Management Systems
  - Urban and Regional Planning
- Geology ..... M.S.
- Health Education ..... M.S.Ed.
  - Community Health Education
  - Industrial Health
  - Safety Education
  - School Health Education
- Higher Education ..... M.S.Ed.
  - Academic Administration
  - College Student Personnel
  - Community and Junior College Teaching
  - Fiscal Affairs Administration
- History..... M.A.
  - American
  - European
  - Latin American
- Journalism ..... M.A., M.S.
- Manufacturing Systems ..... M.S.
- Mathematics ..... M.A., M.S.
- Mechanical Engineering ..... M.S.
- Microbiology..... M.A.
- Mining Engineering ..... M.S.

Music ..... M.M.
- Music Education
- Music History and Literature
- Music Theory and Composition
- Opera-Music Theater
- Performance
- Piano Pedagogy

Pharmacology ..... M.S.
Philosophy ..... M.A.
Physical Education ..... M.S.Ed.
- Applied Physical Education
- Experimental Physical Education
- Professional Physical Education

Physics ..... M.S.
Physiology ..... M.S.
Plant Biology ..... M.A., M.S.
Plant and Soil Science ..... M.S.
- Crop Science
- Horticultural Science
- Soil Science

Political Science ..... M.A.
Psychology ..... M.A., M.S.
- Clinical
- Counseling
- Experimental

Public Affairs ..... M.P.A.
Recreation ..... M.S.Ed.
- Administration of Recreation and Park Systems
- Recreation Resources Administration
- Therapeutic Recreation

Rehabilitation Administration and Services ..... M.A., M.S.
- Adjustment Services
- Job Development and Placement
- Rehabilitation Administration
- Vocational Evaluation

Rehabilitation Counseling ..... M.A., M.S.
- Alcohol Specialist

Social Work ..... M.S.W.
Sociology ..... M.A.
Special Education ..... M.S.Ed.
Speech Communication ..... M.A., M.S.
Statistics ..... M.S.
Telecommunications ..... M.A.
Vocational Education Studies ..... M.S.Ed.
Zoology ..... M.A., M.S.

Master of Fine Arts Degree

Master of Fine Arts (M.F.A.) degree programs are available in the fields below.

Art
Cinema and Photography
Theater

Specialist Degree

Specialist degree programs are available in the fields listed below.

Curriculum and Instruction
Educational Administration
Educational Psychology

Doctoral Degrees

Doctor of Philosophy degree programs are available in the fields listed below along with the approved concentrations.

Anthropology
Chemistry
Communication Disorders and Sciences
Economics
Education
- Curriculum and Instruction
- Educational Administration
- Educational Psychology
- Health Education
- Higher Education
- Physical Education
- Special Education
- Vocational Education Studies

Engineering Science
English
Geography
- Physical Environmental Systems
- Resource Management Systems

Geology
Historical Studies
Journalism
Mathematics
Microbiology
Molecular Science
Pharmacology
Philosophy
Physiology
Plant Biology
Political Science
Psychology
- Clinical
- Counseling
- Experimental

Sociology
Speech Communication
Zoology

The Doctor of Rehabilitation degree is offered in rehabilitation.

The Doctor of Business Administration degree is offered in the area of business administration.

Student Responsibility

Students are responsible for knowing degree requirements and enrolling in courses that will enable them to complete their degree programs. It is also their responsibility to know the University regulations for the standard of work required to continue in the Graduate School. For information, consult both the general and specific degree requirements enclosed in this publication. Additional details about requirements and procedures are available from your graduate adviser or the Graduate School.

Degree Requirements

The following section describes Graduate School regulations unique to the master's, the specialist, and the doctoral degrees. For Graduate School procedures and regulations applicable to all graduate students, regardless of degree program, the student should consult the section titled General Regulations and Procedures. For information about specific degree programs, the student should consult the departmental degree program description.

MASTER'S DEGREE PROGRAM

Requirements and admission policies for applicants to a master's degree program are elaborated in the following paragraphs.

Admission

In order to be admitted to a degree program, an applicant must meet Graduate School admission requirements and be approved by the department or degree program concerned.

The Graduate School requires that the applicant hold a bachelor's degree from an accredited institution or have completed all undergraduate degree requirements prior to the beginning of the classes for the term for which admission is sought. The applicant must have earned a grade point average (GPA) of 2.70 or better ($A = 4.00$) on all undergraduate work completed prior to receipt of the bachelor's degree. Applicants to master's degree level study may begin the admissions process when they need no more than 32 semester hours beyond the credit shown on their transcript at the time of application to complete all requirements for the bachelor's degree.

An applicant who is a U.S. citizen or permanent resident and whose GPA is below 2.70 may be admitted as an unclassified student and may later apply to a degree program when 12 or more semester hours of graduate work at SIUC have been completed. A minimum GPA of 3.00 is required in courses for which grades of *A*, *B*, *C*, *D*, *F* have been assigned.

Any applicant who has completed 12 or more semester hours of graduate work at an accredited U.S. education institution, and who has a GPA of 3.00 or better on all graduate work, may be exempted from the 2.7 undergraduate grade point average requirement.

Any student with fewer than 12 hours of graduate work may be admitted to the Graduate School on the basis of undergraduate GPA only.

General Requirements

Graduate credit earned in graduate courses for which the student has received grades of *A*, *B*, *C*, or *S*, and only such credit, is acceptable for master's degree programs. At least 21 semester hours of graduate credit with grades of *A*, *B*, or *C*

must be earned in courses graded *A* through *F*. An overall grade point average of at least 3.00 in all graduate work included in the master's degree program is required before that degree can be awarded.

The Graduate School requires a minimum of 30 semester hours of acceptable graduate credit for the master's degree. Since certain degree programs require more than 30 hours, the student should consult the description of the appropriate program for specific requirements. No more than half of the credit applied toward fulfillment of the master's degree requirements may be earned at other universities and transferred to SIUC.

At least nine hours of course work must be earned in courses taught on the Carbondale campus or in an approved residency center. After admission to the degree program recommending the awarding of the degree at least nine hours of credit must be earned.

In addition, a minimum of fifteen hours in courses numbered 500 or above must be earned at SIUC.

Candidates for a master's degree are required to pass a comprehensive examination covering all of their graduate work, including the thesis. This examination may be written or oral, or both, as determined by the student's advisory committee.

Time Limits

Only credit earned within a six-year period preceding completion of requirements for the degree, whether at SIUC or elsewhere, will be counted toward the degree. All students must remain registered until completion of their degree. See section Continuing Enrollment Requirement.

Thesis

Each candidate for a master's degree shall write a thesis except where a graduate program has been approved to provide some other arrangement, such as a research paper. The thesis shall be supervised by a committee of at least three members of the graduate faculty and may be counted for not more than six nor less than three semester hours of credit.

Students who have completed all course work and have registered for the minimum number of thesis or research hours required for the degree are subject to the continuing registration requirement described in the section titled General Regulations and Procedures.

Two copies of the approved thesis must be presented to the Graduate School at least three weeks prior to the date of graduation, to be bound and shelved in the library. For nonthesis programs, a research paper should show evidence of the student's knowledge of research techniques and should be based on a special project or specific courses as may be recommended by the advisory committee. One copy of the research paper must be filed in the Graduate School at least three weeks prior to the date of graduation.

Double Major for a Master's Degree

A student may earn a double major for a master's degree if such a program of graduate study is commensurate with the student's vocational and professional goals.

A student interested in pursuing a double major for a master's degree must submit to the graduate dean a written statement of justification for the proposed program and a program of study endorsed by the chairman of both of the cooperating units. The forms for submitting a double major program of study are available in the Graduate School office.

Requirements.

1. The student must have been admitted to one master's degree program.

2. Each unit in which the student wishes to earn a major must have an approved master's degree program.
3. The chairman of each unit must endorse the proposed program.
4. The proposed program must specify the title of the degree which is to be awarded.
5. The proposed program must be approved by the graduate dean.
6. At least 18 semester hours must be earned for each major, and one-half of the required course work for each major must be in courses numbered 500 or above.
7. The minimum number of hours required for the double major must total 60 per cent of the sum of the total required for the two majors individually.
8. The thesis may be counted for not more than a combined total of 6 nor less than 3 semester hours of credit.

Second Master's Degree

A student may earn a second master's degree if the second degree is offered by an academic unit different from that of the first master's degree. None of the hours used towards any previous degree will be allowed to count as a part of the total number of hours toward a second master's, and all regulations shall apply to the second master's degree exactly as they would if this were a first master's degree.

Summary of Master's Degree Requirements

At least 30 hours of graduate credit, or the minimum number of hours required by the specific degree program.
- Grade point average of at least 3.00.
- At least 15 hours in courses numbered 500 or above, which must be completed at SIUC.
- At least 9 hours after admission to the degree program.
- At least 21 hours of graduate course work graded *A*, *B*, or *C*.
- At least one-half of the required number of hours earned at SIUC.
- Courses to be applied to the degree taken within six years of conferring the degree.
- Transfer credit taken at another institution or as an unclassified student approved by the dean of the Graduate School.
- Two copies of an approved thesis or one copy of an approved research paper turned in to the Graduate School (not applicable for M.B.A. program).
- Comprehensive or oral examination.
- Submission of departmental clearance form.
- Register for 601 Continuing Enrollment.

SIXTH-YEAR SPECIALIST DEGREE PROGRAM

The sixth-year specialist degree program is for qualified students who wish to pursue a specialization in an educational field. The student must hold a master's degree or its equivalent as determined by the specific department. Sixth-year courses of study are offered in the professional education areas of curriculum and instruction, educational administration, and educational psychology.

Admission

Students seeking admission to the sixth-year specialist degree program follow the same procedures that apply for admission to other graduate programs. Admission to the sixth-year specialist degree program requires a grade point average of 3.25 (*A* = 4.00) for all previous graduate work. Faculty of a degree program-unit may add its own grade point average requirements (above the Graduate School minima) for admission to that particular program. The student's

previous work shall have provided a proper base of general and special preparation for the sixth-year studies; if this is lacking, additional work must be taken to establish this base. Two years of experience relevant to the specialized field are required.

General Requirements

A minimum of 30 semester hours of work beyond the master's degree or its equivalent must be completed with a minimum grade point average of 3.25. An advisory committee of three members for each candidate shall be appointed by the dean of the Graduate School upon the recommendation of the chairman of the respective department. The student's work must be planned early by the student with the advisory committee and must clearly lead toward the specialization sought. No more than 15 hours earned for work done on campus at another university (for this purpose Southern Illinois University at Edwardsville is considered to be another university) or in extension from SIUC, or any combination of the two, may be counted toward the degree.

A field study is required of each candidate for the specialist degree. A written report of the field study is to be submitted to the student's advisory committee before a final oral examination. After the advisory committee approves the field study report, one copy will be forwarded to the Graduate School to be placed in Morris Library.

All credit must have been earned within seven years prior to completion of the program. All students must remain registered until completion of their degree. See section Continuing Enrollment Requirement.

The residency requirement is fulfilled by enrollment for at least eight semester hours in a single semester or at least six semester hours in each of two terms (semesters or summer session of at least eight weeks duration). Credit earned in an educational specialist's degree program may, upon the approval of the student's doctoral committee and college, count toward a Ph.D. degree in education but it can not be considered as part of the residency requirement.

It should be noted that the admissions process is slightly different for unclassified (nondegree) and international students and such students should note the paragraphs at the end of this section.

DOCTORAL DEGREE PROGRAM

All Graduate School requirements for the Doctor of Philosophy degree also apply to other doctoral degree programs under the jurisdiction of the Graduate School.

Admission

Admission to a doctoral program in the Graduate School normally requires a master's degree or its equivalent, a grade point average in graduate work of at least 3.25, and acceptance by the academic unit offering the doctoral program. Faculty of a degree program-unit may add its own grade point average requirements (above the Graduate School minima) for admission to that particular program. Direct post-baccalaureate degree entry is possible upon recommendation of the department and acceptance by the Graduate School. An applicant to doctoral level study may begin the admission process when the applicant needs no more than 16 additional semester hours (24 quarter hours) beyond the credits shown on the transcript at the time of application to complete all requirements for the master's degree. The graduate dean informs each student of any conditions for admission imposed by the Graduate School or by the academic unit.

Accelerated Entry into a Doctoral Program

Applicants with exceptional research potential or outstanding academic preparation may have the option to enter a doctoral program after one semester as a

master's level student. Not all departments participate in the accelerated entry option; therefore, the interested applicant should contact the appropriate department.

The student initially must be admitted into a master's level program. After at least one semester and evidence that the applicant is prepared to begin research at the doctoral level and meets other departmental criteria for accelerated entry, the department may recommend admission directly into the doctoral program. The student must also meet the doctoral admission requirements including the minimum 3.25 grade point average for all graduate work.

It should be noted that course work to be applied toward residency does not begin until after admission into the doctoral program.

General Requirements

The doctoral degree is awarded for high accomplishment in a particular discipline or a recognized interdisciplinary area, as measured by the student's ability to pass the preliminary examination for admission to candidacy, meet the research tool requirement of the program, perform a piece of original research, present the results in proper form in a dissertation, and defend the dissertation before a faculty committee. Except for the hours required to meet residency, there is no Graduate School requirement that a certain number of semester hours be taken for the doctorate although some degree programs do require a certain number of semester hours. Graduate work completed at another institution may be eligible for transfer to the student's doctoral program, subject to Graduate School regulations regarding transfer of credit and acceptance by the student's major department.

No doctoral level residence-credit program may be established off campus, although course work involved in a doctoral program may be taken at an off-campus residence center provided that the full, normal requirement of residence on campus at SIUC is met under the usual Graduate School standards for doctoral programs.

Preliminary Examination

The student will generally prepare for this examination through independent study and course work, as advised by the faculty of the doctoral program. The examination is given to determine the breadth and depth of the student's knowledge within the discipline. The particular form and content of the examination are determined by the faculty of each of the doctoral programs. The student will be permitted to take the preliminary examination at the discretion of the department, after having completed two years of full-time study or its equivalent beyond the baccalaureate.

Research Tool Requirement

The doctorate at SIUC is a research-oriented degree. The research tool requirement is intended to be an integral part of the student's program. Since research materials, problems, and techniques vary from discipline to discipline, the details of the research tool requirement are determined by the faculty of each of the doctoral programs.

Residency

The residency requirement for the doctorate must be fulfilled after admission to the doctoral program and before formal admission to doctoral candidacy. The residency requirement is satisfied by completion of 24 semester hours of graduate credit on campus as a doctoral student within a period not to exceed four calendar years. No more than six hours of deferred dissertation credit may be applied toward fulfillment of the 24 semester hours residency requirement. No doctoral student will be permitted to sign up for more than six hours of dissertation

until candidacy has been achieved. Any dissertation hours registered for above the six permitted prior to candidacy will not be counted toward completion of the doctoral degree. Credit earned in concentrated courses or workshops may apply toward fulfillment of the residency requirements if the student is concurrently registered for a course spanning the full term. No more than six semester hours of short course or workshop credit may be applied to the 24 semester hours residency requirement.

Admission to Candidacy

Admission to candidacy is granted by the dean of the Graduate School upon recommendation of the faculty responsible for the student's program, after the student has fulfilled the residency requirement for the doctoral degree, passed the preliminary examination, and met the research tool requirement of the program. The doctoral degree may not be conferred less than six months after admission to candidacy, except upon approval of the dean of the Graduate School. The candidate must fulfill all requirements for the degree within a five-year period after admission to candidacy. If completion of requirements is delayed beyond five years, a student may be required to take another preliminary examination and be admitted to candidacy a second time. All candidates must remain registered until completion of their degree. See section Continuing Enrollment Requirement.

Dissertation

After being admitted to candidacy, the student must complete a dissertation showing that the student is capable of independent research or other creative effort. A successful dissertation usually represents the most extensive and intensive scholarly work the student has performed to date. Completing the dissertation will lead the student up to the cutting edge of research (however defined by the discipline) conducted at that time in his or her field of research. A dissertation must address a significant question and demonstrate that its author can interpret findings and formulate conclusions that are the result of independent thinking and sustained evaluation of source materials. These findings must be expressed in clear and grammatical language that is well organized into cogent and coherent argument. The dissertation shall be supervised by a faculty committee which has been approved by the dean of the Graduate School. Unless the graduate dean has approved an exception requested by the student's academic unit this committee shall consist of five graduate faculty members, at least one of whom shall be from a graduate program outside the student's academic unit. The student's academic unit shall be understood to mean the department (or equivalent units) and any member outside the department is eligible to serve as the outside member providing that the department and the graduate dean agree.

While working on the dissertation, the student must register for the course numbered 600. The student is to devote at least one academic year of full-time work to complete the dissertation and will register for 24 semester hours of dissertation credit, for example, 12 hours for each of two terms.

Students who have registered for 24 semester hours of dissertation credit and have not completed the doctoral dissertation are subject to the continuing enrollment requirement described in the section titled General Regulations and Procedures.

Publication of the doctoral dissertation to insure its availability to the scholarly community is considered an integral part of the process of doctoral education. Students are encouraged to have their dissertations microfilmed by University Microfilms. Alternate methods of publication may be approved by the graduate dean if the dissertation is to be published within a reasonable period of time. Such publication must be in a relatively permanent form, without substantial alterations, and be available to the scholarly community. In either case, an

abstract of the dissertation will be published in *Dissertation Abstracts International*.

The student must submit two copies of the dissertation acceptable to the Graduate School, along with an abstract of 350 words or less. Unless prior approval is granted for another form of publication, all dissertations will be microfilmed. There is a fee of $55.00 to cover the cost of publication of the abstract and microfilming of the dissertation. If an alternate form of publication has been approved the fee is $45.00 to cover the cost of publication of the abstract. If copyright is desired, an additional fee of $25.00 will be required. The microfilming agreement form and the survey form of earned doctorates are completed in the office of the Graduate School at the time the dissertation is submitted.

The abstract will be published in the current *Dissertation Abstracts International* and the dissertation will be cited in *American Doctoral Dissertations* and *Comprehensive Dissertation Index*. A copy of the microfilmed dissertation will be placed in the Library of Congress archives. This service assures the student that the dissertation will be available to other researchers at no further personal expense to the student.

If the student elects to use the copyright service, copyright will be obtained in the student's name. Publication rights, other than for reproduction in microform or from microform, are the student's to assign to any publisher at any time. In addition, arrangements can sometimes be made for University Microfilms to publish a small edition of the dissertation.

Final Examination

There will be a final oral examination administered by the student's doctoral dissertation committee. The examination will cover the subject of the dissertation and other matters related to the discipline. Any member of the graduate faculty may attend the final oral examination and may participate in questioning and discussion, subject to reasonable limitations imposed by the chairperson of the committee, but only members of the committee may vote or make recommendations concerning acceptance of the dissertation and final examination. A student will be recommended for the degree only if the members of the committee, with at most one exception, judge both the dissertation and the performance at the final oral examination to be satisfactory. In cases where a committee of more than five members has been approved, the requirement of not more than one negative vote will still apply.

Interdisciplinary Doctor of Philosophy Programs

These guidelines provide for interdisciplinary doctoral programs for a limited number of students whose educational requirements can be met by existing resources, but not exclusively by any one of the University's constituent units. Interdisciplinary doctoral programs will be instituted in response to the particular academic interest of individual students, not as programs of a permanent nature. The procedures and criteria given below govern the authorization and control of interdisciplinary doctoral programs.

1. After admission to an established doctoral program at SIUC and upon the recommendation of the chairperson or adviser of that program, a student may apply for an interdisciplinary doctoral program to the dean of the Graduate School.
2. The dean of the Graduate School will apply the following criteria in deciding whether a program committee should be established to consider the proposed interdisciplinary doctoral program.
   a. The requisite staff must be available.
   b. The library holdings must be adequate without unreasonable additions.

   c. The program must lie within the recognized disciplines or fields of study, at least one of which offers the doctoral program.
3. If the dean of the Graduate School is satisfied that the proposed program satisfies these criteria, the dean shall form a special program committee of five members, at least three of whom shall be from units offering the doctorate.
4. If the committee approves the proposed program, a plan of study shall be developed that includes the following elements:
   a. Fields or areas of study
   b. Required courses
   c. Languages or other research tool requirements
   d. Dissertation subject
   e. Preliminary examination
5. The program as approved by the committee and accepted for principal sponsorship by a unit with an approved doctoral program shall be submitted to the dean of the Graduate School. Upon final approval the student's program shall have the same binding effect upon the Graduate School as programs printed in the graduate catalog. The degree earned shall carry the title of the doctoral unit that has assumed principal sponsorship. The commencement program shall give specific indication that the degree is interdisciplinary and include a listing of those units that are substantively involved in addition to the principal sponsoring unit, as determined by the graduate dean.
6. When the committee has certified all the required performances, including the results of examinations, the committee shall be dissolved.

Summary of Doctoral Degree Requirements

- Achievement of a grade point average of at least 3.00.
- Completion of any specific courses required by the doctoral program.
- Fulfillment of the residency requirement.
- Completion of the research tool required by the doctoral program.
- Passing of the preliminary examination.
- Admission to candidacy.
- Completion of an approved dissertation with 24 hours of dissertation credit.
- Oral defense of dissertation.
- Submission of two approved copies of the dissertation to the Graduate School.
- Payment of $55.00 microfilming fee.
- Completion of microfilm agreement and survey of earned doctorates at the Graduate School office.
- Degree conferred not less than six months nor more than five years after admission to candidacy.
- Submission of departmental clearance form.
- Register for 601 Continuing Enrollment.

General Regulations and Procedures

This section includes Graduate School procedures and regulations applicable to all graduate students regardless of degree classification. Requirements unique to the master's, specialist, and doctoral degrees, are stated in the section titled Degree Requirements. For information about specific degree programs the student should consult the appropriate degree program description. Requirements unique to the nondegree classifications are stated in the section in this chapter titled Unclassified Students—Non-Degree.

APPLICATION FOR GRADUATE STUDY

Students interested in admission to degree programs should contact appropriate departments directly to obtain official Graduate School application forms and other departmental materials. Students interested in unclassified (non-degree program affiliated) status, should contact the Graduate School directly to obtain application materials. In addition, students should carefully read directions obtained from departments on where to send official transcripts. Regardless of where the official transcripts are eventually sent, such transcripts must be forwarded directly from the registrar of previously attended schools (other than SIUC).

Transcripts

Students must have the registrar of each college previously attended (except SIUC) send an official transcript of the student record to either the Graduate School or the degree program director (check departmental procedures). Students applying for unclassified (non-degree status) must have the registrar of the degree-granting institution send one official transcript indicating the receipt of the bachelor's (or higher) degree to the Graduate School. Transcripts from institutions where the student received neither a degree nor enrolled for more than 12 semester hours of undergraduate credit are not required, provided that the grades obtained at such institutions are recorded upon the transcript of the college which granted the student's degree. Transcripts submitted directly by students are not acceptable. Transcripts and other admission credentials will not be returned nor forwarded to other institutions.

In accord with the Family Education Rights and Privacy Act of 1974, no non-Southern Illinois University at Carbondale person, firm, or agency may have access to an applicant's or a student's credentials without written consent of the individual concerned. Graduate students shall be permitted to examine their own records upon request. Such requests should be made by the student to the dean of the Graduate School.

Test Scores

The Graduate School does not require the Graduate Record Exam (GRE); however, various departments may require, at their discretion, the GMAT, GRE, MAT, or other appropriate standardized tests for admission. Refer to the departmental program description or contact the department for specific information.

Deadlines

In order to be fully admitted to a degree program at the beginning of the academic term, an applicant should see to it that all required admissions materials are submitted no later than 90 days prior to the beginning of the term for which the applicant is seeking admission.

Admission is for the term indicated and a student who does not enroll in courses for that term will be required to update the application by notifying the Graduate School before being allowed to enroll in courses.

If the term for which the applicant is applying is more than two years after the term of original admission, a student applying to a degree program must have the registrar of all institutions previously attended furnish official transcripts. An unclassified, nondegree student must have the registrar of the bachelor's degree-granting institution furnish one official transcript. If a student is applying to a degree program and has taken any course work at another institution between the first admission and the first registration, the applicant must

have the registrar of the appropriate institutions furnish official transcripts of this work regardless of the amount of time elapsed.

Requirements

The admission requirements of the Graduate School and the department must both be met before the student is admitted to a degree program, and both the Graduate School and the department may specify conditions. Most departments require additional materials such as letters of recommendation and these should be forwarded directly to the applicant's major department. The student will be informed by the Graduate School of the resultant admission status after this process has been completed.

Admission of Faculty Members

No one who holds a faculty appointment at any of the academic ranks—lecturer, instructor, assistant professor, associate professor, and professor—shall be admitted to a graduate degree program at any level, or be eligible to register for courses to be taken for graduate credit, in the graduate degree program in which the faculty member holds the appointment. If a faculty member has been admitted to a graduate degree program in some unit other than the one in which such appointment exists, no member of the faculty of the unit in which the appointment is held may be a member of that colleague's thesis committee, graduate program committee, dissertation committee, or any other examining committee. (See also faculty appointments in the section titled Financial Assistance.)

Admission of International Students

This school is authorized under federal law to enroll non-immigrant alien students. A student from abroad is subject to all requirements for admission established by the Graduate School. In addition, the applicant must complete special forms pertaining to the admission of international students. For these admission forms and for other information concerning international students, inquiries should be sent to the Graduate School.

To allow ample time for visa and other departure procedures, the applicant should have an application and all supporting documents on file with the University no less than four months prior to the proposed entry date.

International students must be enrolled in a program leading to a graduate degree. They cannot be admitted as unclassified students.

If the above requirements are satisfactorily met and the student is admitted to a degree program, the applicant will be required to certify that personally adequate financial resources will be available to undertake and continue in a program of study.

Test of English as a Foreign Language (TOEFL). All applicants whose native or first language is not English must take the TOEFL test no more than 24 months prior to the term for which the applicant is seeking admission. A minimum TOEFL score of 550 is required for Graduate School admission; higher scores may be required for admission into specific degree programs.

Exemptions to the TOEFL requirement are: (1) an applicant who has completed a bachelor's degree (four years attendance and completion of at least 100 semester hours of course work) at an accredited institution in the United States; (2) an applicant who has completed a master's degree at an accredited institution in the United States, who obtained a TOEFL score of at least 550 prior to beginning graduate studies and who has been in residence in the United States continuously prior to application to SIUC. Verification of the earlier TOEFL score by the degree granting institution is mandatory.

Academic Requirements. If a foreign-born applicant has completed a four-year bachelor's degree program at an accredited institution in the United States of America, the applicant may be given the same consideration for admission to a graduate degree program as a United States citizen, in regard to both academic requirements and the use of English as a foreign language.

Applicants who have completed the equivalent of a four-year bachelor's degree at a recognized institution in any other country must have an academic record equivalent to a 2.70 grade point average ($A = 4.00$) for admission to a master's degree program.

The determination of the applicant's grade point average shall be the responsibility of the Graduate School.

Applicants for doctoral programs must meet the regular academic requirements for admission to a doctoral program.

Qualification for Assistantship with Teaching Duties. Every non-native English speaker assigned a graduate assistantship with teaching duties must pass an examination of oral English skill before undertaking classroom duties. A representative of the appointing department and of the Graduate School must participate in the examination.

REGISTRATION

Only those students who have been officially admitted by the Graduate School will be permitted to register.

Each student admitted to a degree program must consult a graduate adviser in the designated major department before going to the graduate desk of the Office of Admissions and Records for registration.

Unclassified nondegree students begin registration immediately at the graduate desk in the Office of Admissions and Records.

The schedule of classes for a particular semester or for the summer session is available from the Registration Center in the Office of Admissions and Records.

Students are strongly encouraged to complete their registration before the beginning of classes. After the beginning of the term, the student must have the approval of the Graduate School to register late and may be required to pay a late registration fee. Program changes after registration must be approved by the student's adviser and the dean of the Graduate School and may involve payment of a program change fee. In addition, after the first week of classes, registration or program changes involving adding a course must have the approval of the instructor of each course.

Information concerning registration dates and deadlines for the first time the student attends the University will be sent when the student is admitted to the Graduate School. Continuing students should consult the Schedule of Classes for each semester to find deadlines and dates for registration.

Graduate Mail Registration

During the advance registration period for a term (see registration calendar for dates in the Schedule of Classes) graduate students admitted to a degree program, and admitted unclassified graduate students have the opportunity to register by mail. Graduate students admitted into a degree program should contact their graduate adviser to have the adviser sign their Course Request Form as a prerequisite to the process. Unclassified graduate students need not obtain an adviser's signature.

Late Registration

A late registration fee of $15 shall be assessed to all students taking on-campus classes who register after the designated registration period. This fee shall be nonrefundable and nonwaiverable, except when it is clearly shown that the late registration was caused by faculty or administrative action. Off-campus classes and registration in 599, 600, and 601 shall be exempt from such fee.

Withdrawal from Courses and from the University

WITHDRAWAL FROM COURSES

Students officially registered for courses must withdraw formally. They must process an official withdrawal form. Outlined below are the procedures to be followed by graduate students when withdrawing from courses.

DEADLINES FOR WITHDRAWING FROM THE UNIVERSITY OR FROM A COURSE

If Classes Meet for	Deadline for Withdrawal to Receive Refund	Deadline to Withdraw
13–16 weeks	3rd week	8th week
9–12 weeks	2nd week	6th week
7 or 8 weeks	2nd week	4th week
4–6 weeks	1st week	3rd week
2 or 3 weeks	1st week	1st week
less than 2 weeks	2nd day	2nd day

Students officially withdraw from courses through the program change process. This process starts with the academic adviser and is completed at the Registration Center. Graduate Students may withdraw from a course through the 8th week of the fall and spring semesters. Withdrawal deadlines for shorter sessions are correspondingly earlier (see schedule above). Official withdrawals during the first three weeks of the semester result in no entry being made on the student's record. Official withdrawals after the third week but prior to the 8th week of classes will result in the course listed on the student's record with the symbol *W* and the week of withdrawal. No withdrawals from a course will be authorized after the 8th week of classes. It is the student's responsibility to insure that the withdrawal process is officially completed.

WITHDRAWAL FROM THE UNIVERSITY

A complete withdrawal from the University may be authorized by the graduate dean at any time during the semester prior to the assignment of grades. Students who withdraw from all classes will have a statement of withdrawal from the University and the week of withdrawal entered on their records. Students who find it necessary to withdraw from the University after school has started and who are on campus should contact the Graduate School in person to initiate the withdrawal process. If they are unable to come to campus, they may write the Graduate School asking that it process a withdrawal.

Students who advance register, including the paying of tuition and fees, and then find they cannot attend school must process an official withdrawal the same as do those who withdraw after school starts. In this case the process is the same as outlined in the paragraph above. Students who advance register but do not clear tuition and fees by the announced deadline date have their registrations cancelled by the University. Students who have deferred payment of tuition and fees must officially withdraw if they stop attending classes; the failure to pay deferred fees by the deadline date does not cancel one's registration nor remove the obligation to pay the deferred fees.

Refer to the section titled Payment and Refunding of Tuition and Fees in this chapter for information about the refunding of tuition and fees when withdrawing from the University. Refer to that section, also, relative to special considera-

tions extended to students withdrawing from school for extended military service.

Student Course Loads

For federal financial aid purposes *only*, the following number of semester hours will be as full-and half-time:

	16-week semester	8-week session
Full-time	12	6
Half-time	6	3

Maximum course work for graduate students is 16 hours each semester; 12 hours is considered a normal load.

The maximum and minimum loads for graduate students under various types of financial support are summarized in the following table:

	16-Week Semester		8-Week Session	
Type of Financial Support	Max.	Min.	Max.	Min.
No financial support	16		8	
Graduate Assistantships				
1/2 time appointment	12	6	6	3
1/4 time appointment	14	6	7	3
More than 1/2 time appointment	8	3	4	2
Full-time University employees*	8		4	
Graduate Fellowships	16	12	8	6
Full Veteran's Benefits	16	10	8	5
SIUC Scholarships	16	8	8	4

A graduate student must enroll in 400- and 500-level credit work to meet the above minima. Audit work will not qualify to meet the minimum load. However, audit work is calculated in determining a student's maximum course load.

Exceptions to these maxima and minima are possible only with the written permission of the graduate dean.

Continuing Enrollment Requirement

Students who have not completed all degree requirements but who have previously enrolled for the minimum number of research, thesis, or dissertation credit hours required of the degree, must enroll every semester for at least one hour until all degree requirements have been completed. Summer sessions are exempted from the continuous enrollment requirement. Any graduate student who is not enrolled continuously as described above and who subsequently completes degree requirements, must have the permission of the graduate dean to graduate. Such permission will be contingent upon payment of the tuition and fees that would have been paid if the student had enrolled continuously each semester.

Continuing Enrollment—601. This course is offered by each graduate degree program for students who have previously registered for the minimum number of research, thesis, or dissertation credit required of the degree. Registration in 601 (1 hour per semester) is required of all graduate students, whether in residence or not, who are not otherwise enrolled. Concurrent registration in any other course is not permitted.

Students registering for 601 are assessed only tuition and the Student Center Fee for the credit hours associated with the registration. Since none of the other student fees are assessed for 601, the student is not eligible for the benefits of any other programs such as Recreation Center use, Health Service and Student Medical Benefits, Students' Attorney Program assistance, etc. Students needing

* Civil Service staff must have approval from the Personnel office to register for courses.

the above benefits that require fees may instead register for additional research, thesis, or dissertation hours.

School of Law Courses

A graduate student may enroll for graduate credit in law courses designated by the symbol *G* (e.g., Law 501G) if the student has permission of the dean of the School of Law and the dean of the Graduate School. Registration must be processed through the Graduate School and the grades will be reported on the Graduate School letter-grade system (*A*, *B*, *C*, etc.).

A graduate student may enroll in law courses for law credit only if the student has been duly admitted to the School of Law.

A law student may register for law credit in graduate courses with approval of the dean of the School of Law and the graduate dean. Registration must be processed on School of Law forms and the grades will be reported on the Graduate School letter-grade system.

A law student may not register for graduate courses for graduate credit unless the student has been admitted to the Graduate School.

Financial Assistance

Financial assistance is available to qualified students in all fields of study in the form of (1) graduate assistantships where one serves as a classroom teacher or assistant, as a research assistant, or as an administrative assistant, (2) fellowships or traineeships, (3) scholarships, (4) college work-study programs, and (5) loans. There are basic regulations that relate to these awards. Students should make application for the graduate assistantships, fellowships, or traineeships through the department to which they have been admitted. Information and application forms for the tuition scholarship program may be obtained from the Graduate School office. Information regarding the student work program and loans may be obtained by contacting the Financial Aid Office.

Students should be sure that their applications for admission are complete including the submission of required transcripts to the Graduate School to assure consideration for an award.

Graduate assistant appointments, graduate fellowships, and most traineeships include a tuition scholarship, but fees must be paid by the student. A student may receive no more than two calendar years of graduate-student support while a master's level student. A student may receive no more than four calendar years of graduate-student support while a doctoral-level student. These time limits apply to assistantships, fellowships, traineeships, and other similar awards and appointments administered by the University, regardless of source of funds. Students who are awarded graduate assistantships, fellowships, or traineeships, but who have not furnished official proof of their most recent degree to the Graduate School shall be considered to be on term appointment for one semester only. No one will be appointed to a second term until an official transcript indicating receipt of the degree is received in the Graduate School.

Acceptance of an offer of financial aid (such as graduate scholarship, fellowship, traineeship, or assistantship) for the next academic year by an actual or prospective graduate student completes an agreement which both student and graduate school expect to honor. In those instances in which the student accepts the offer before April 15 and subsequently desires to withdraw, the student may submit in writing a resignation of the appointment at any time through April 15. However, an acceptance given or left in force after April 15 commits the student not to accept another offer from another institution without first obtaining a written release from the institution to which a commitment has been made.

Similarly, an offer by an institution after April 15 is conditional on presentation by the student of the written release from any previously accepted offer.

Graduate Assistants

Graduate assistantships (GA) are available in a variety of places across campus, from academic departments and research centers to administrative and service units. This type of appointment comprises the largest number of awards offered by the University. For these appointments, students apply directly to the chair of the department to which they have been admitted, who may in turn refer the students to a research center or administrative or service unit. A graduate assistant must be a registered student in a degree program. Unclassified students are not eligible for graduate assistantships.

The average GA appointment is 50% appointment (20 hours per week) and lasts for one academic year (9 months). There are also some 25% appointments requiring 10 hours per week. A student may hold two simultaneous quarter time (25%) appointments on campus without special approval. GA appointments may be either on a semester-pay basis or a fiscal-pay basis.

Appointments of at least 25% time for the full length of an academic term qualify for a tuition scholarship. The appointment papers, however, must have a starting date on or before the fifteenth day of classes for the tuition scholarship to apply. If a student is appointed for less than a full academic term on a fiscal pay basis, the appointment will not carry a tuition scholarship. A GA who holds an appointment for the full academic term but resigns before the end of the term still is granted the tuition scholarship for that term. A GA holding an appointment for the full length of two consecutive semesters will be eligible for a tuition scholarship the summer session immediately following the two consecutive semesters.

Salary schedules for graduate assistantships vary from unit to unit. Currently, monthly stipends range from $646 to $882 (50% appointments). Generally doctoral students are paid higher rates than master's students. Information about the specific conditions of the appointment should be directed to the department or unit making the appointment.

In the best interests of both the University and students, academic departments should monitor outside employment and intervene in those cases where outside employment results in problems. Toward this end, it is within the rights and responsibilities of a department: 1) to require that graduate assistants holding outside employment notify their department, so that their performance can be monitored; 2) to make the relinquishing of outside employment a precondition for the continued enrollment of, and/or availability of assistantships to, students whose academic or assistantship performance has been rated Unsatisfactory; and 3) to cancel or not renew the assistantship contracts of those students whose assistantship performance is rated Unsatisfactory and who also hold and do not discontinue outside employment. Graduate students can appeal departmental decisions regarding outside employment and academic/assistantship status through the University's standard routes of appeal.

College Work-Study Graduate Assistantships

The Graduate School and the Financial Aid Office jointly administer the College Work-Study Assistantship program. This program supports approximately fifty graduate assistants each year. The program provides for up to 70% of each graduate assistantship from federal funds, with the remainder coming from departmental or collegiate funds. Students qualify for this program on the basis of financial need. Students must be citizens or permanent residents of the United States. Further information on application procedures and eligibility criteria is available from the Graduate School.

Graduate Fellowships

The Graduate School and some departments offer a number of graduate fellowships. The number varies depending upon the funds available for these awards each year. All awards of this type are highly competitive based upon scholarship and potential for success in graduate study. Application for these awards should be made by February 1 preceding the academic year for which the award is desired. Application forms and information about the award may be obtained by contacting the department to which one has been admitted or is seeking admission.

The stipend for a fellowship is $650 per month, or $7,150 for eleven months for master's degree students; for doctoral degree students the stipend is $700 per month, or $7,700 for eleven months. Graduate School fellowships include a tuition scholarship. While on fellowships, students shall not hold other appointments in the University, nor shall they hold jobs outside the University, since the purpose of the fellowship is to provide students with a source of income which will enable them to work full time at graduate studies rather than work part time at a job and part time at studies. There may be a training assignment if this has been outlined at the time of the appointment. Fellowship awardees must remain on campus as fulfillment of their award except with permission by the graduate dean.

Traineeships

Individual departments often are able to provide traineeships. Information about these awards should be directed to the department to which one has been admitted or is seeking admission.

Dissertation Research Awards

Dissertation research awards are designed for superior students who are in the dissertation preparation stage of their graduate education. Selection is based upon a competition primarily considering the students academic research and quality of the dissertation prospectus. Students who will have started their dissertations by the end of the fall semester (advanced to candidacy, completed preliminary examinations, and completed most of their course work and research tools) may apply for the award during the preceding spring semester. A recipient of a dissertation research award must be officially admitted to candidacy by the end of the semester in which the award begins. The application should be submitted by February 1. The award is for a maximum of 11 months at a monthly rate of $822 or $9,042, plus tuition scholarship.

Students holding a dissertation research award are expected to devote full-time to the approved research project as determined by their department. The student should be enrolled for graduate credit hours or dissertation hours. The student holding such an award is expected to resign the award at the time the dissertation is submitted to the Graduate School if this comes prior to three weeks before the end of the time period for the award.

Graduate Dean's Fellowships

Several special graduate dean's fellowships are offered annually to students who, although not selected for a regular fellowship, in the judgment of the graduate dean show unusual promise for success in graduate studies. Students will be considered for these awards who have overcome social, cultural, or economic disadvantages in attaining their educational objectives. Application should be made through the chair of the department in which the student is enrolled.

Stipend rates and related regulations are the same as for the regular graduate fellowships. There is no service requirement other than those activities which

are required by departments of all students regardless of the source of their support.

Delyte and Dorothy Morris Doctoral Fellowship Program

The Delyte and Dorothy Morris doctoral fellowships have been established by Southern Illinois University at Carbondale to honor a distinguished former president and his wife. During Dr. Morris's tenure as president (1949–71) the University grew to be a comprehensive research institution and established doctoral programs in twenty-two fields, now twenty-five fields.

Eligible applicants must be at the beginning of their doctoral work. Therefore, applications prior to entrance into a doctoral program is required. Only applicants who have received no prior degree from SIUC and who have done no graduate work at SIUC are eligible. Applicants must possess the credentials of very promising scholars as indicated by high scholastic standing, excellent scores on standardized tests, outstanding recommendations, and evidence of high potential for research and publication.

Morris fellows will receive $12,000 and a tuition scholarship for up to three years of full-time doctoral study at SIUC. Fellows are not eligible to hold another appointment either within or outside the University. Application deadline is February 1. Contact the Graduate School for application information.

State Fellowship Programs for Minority Students

The state of Illinois is currently supporting two fellowship programs for minority graduate students, the Illinois Minority Graduate Incentive Program (IMGIP) and the Illinois Consortium for Educational Opportunity Program (ICEOP). Both programs are designed to develop minority faculty and staff for Illinois institutions of postsecondary education; graduates of each program must agree to seek and accept appropriate employment in Illinois higher education. There are differences between the two programs in terms of eligible minority groups, residency requirements, eligible programs of study, etc. For further information and application materials, contact the IMGIP/ICEOP administrator in the Graduate School. While on IMGIP or full ICEOP awards, students may not hold other appointments either inside or outside the University, since the purpose of the fellowships is to provide students with a source of income which will enable them to study full time. All other rules and regulations governing University fellowships apply to these programs. Deadlines for applications are early in February for the following fall semester.

Patricia Roberts Harris Fellowship Program

This is an interrelated fellowship program that complements an overall Graduate School commitment to attract and retain increased numbers of highly qualified doctoral students from previously underrepresented groups. The present focus of the Patricia Roberts Harris program at SIUC is to recruit qualified minority students to doctoral programs in psychology, rehabilitation, and communication disorders and sciences and further provide a mechanism for their psychological, social, and educational support. Stipends for Patricia Roberts Harris fellows are $10,000 plus a tuition scholarship and waiver of fees. While holding a Patricia Harris fellowship, students may not hold other appointments either inside or outside the University, since the purpose of the fellowship is to provide students with a source of income which will enable them to study full time. All other rules and regulations governing University fellowships apply to this program. Contact the Graduate School for information.

The National Consortium for Educational Access, Inc.

The National Consortium for Educational Access, Inc. (NCEA) offers a funding alternative for those who wish to pursue study towards the doctoral degree.

Through NCEA a fellowship award is given, contingent upon and supplemental to the financial assistance provided by a participating doctoral degree granting institution. Black Americans choosing to study in an academic area of underrepresentation or faculty members who want to continue to teach at the college or university level are encouraged to apply. An NCEA fellowship supplement averages between $3,000 to $7,000 per year, making combined assistance from NCEA and the doctoral degree granting institution between $9,000 to $15,000 per year. Annual fellowship renewals are dependent upon satisfactory performance and normal progress toward the doctoral degree.

NCEA structurally is a partnership agreement among 42 historically black colleges and universities, and over 25 doctoral granting institutions (including SIUC) supported by corporations, foundations, and the university system of Georgia, merged to provide a financial base for those who can help NCEA meet the following goals: (1) increase the pool of black Americans holding the Ph.D. degree in disciplines underrepresented by black Americans and (2) simultaneously increase the number of black Americans with a Ph.D. degree who want to teach in our nation's colleges and universities. Therefore, two distinct kinds of applicants are sought: faculty members working at a historically black college or university who want to continue to teach and the black American who wants to pursue the terminal degree with the intention of teaching in higher education. For further information contact the Graduate School at SIUC or the executive director of NCEA, 296 Interstate North Parkway, Suite 100, Atlanta, GA 30339 (404-421-3255).

Tuition Scholarships

A limited number of tuition scholarships are awarded to graduate students on the basis of scholarship. The award is for remission of tuition; fees must be paid.

To be eligible the student must be admitted to the Graduate School and to a department, and the student may not hold another University appointment which provides a tuition scholarship. Tuition scholarship recipients must enroll for a minimum of 8 hours each semester (4 hours in summer). There is no service requirement other than the duties required by a department of all students regardless of their source of support.

Application forms are available in the Graduate School office. Students should submit application forms at least one full semester preceding the semester for which the tuition scholarship is requested.

Financial Aid Office

Other forms of financial assistance available through the Financial Aid office include part-time employment on and off campus, cooperative work-study programs, summer employment, and student loan funds.

External Support for Graduate Study

Fellowships, grants-in-aid, scholarships, and other similar awards for the support of graduate students are available from many sources outside the University. Students are encouraged to apply for such awards. Information concerning appropriate external sources of support may be obtained from the Office of Research Development and Administration or from department chairs or directors of graduate studies of the student's major department.

Faculty Appointments

No student in a graduate degree program shall be appointed to any full-time faculty position in the department (or equivalent unit) while enrolled in the unit as a student, with the sole exception that a student who has already been admitted to candidacy for the doctoral degree may be granted a term appointment as an

instructor in the unit while so enrolled. Such a term appointment shall not be renewable beyond a period of one year.

Satisfactory Progress Policy for Graduate Students

PURPOSE

The Federal Government, the States, and Southern Illinois University at Carbondale have invested large sums of money in order to provide financially needy students the opportunity to attain a post-secondary education. Financial aid recipients are responsible for using the funds in an acceptable manner. Therefore, a classified graduate student who wishes to benefit from the receipt of financial aid must maintain satisfactory progress as defined in this policy.

AUTHORITY

The Higher Education Act of 1965, as amended, and the final regulations set forth by the Department of Education in 34 CFR 668 require that institutions of higher education establish reasonable standards of satisfactory progress. A classified graduate student who does not meet these standards is not eligible to receive applicable federally funded and/or state funded financial aid. Southern Illinois University at Carbondale shall make these standards applicable to the following federal aid programs: Perkins Loan, College Work- Study, Stafford Loan Program, and the Supplemental Loans for Students. Applicable state programs are identified by the state agencies. Unclassified graduate students are only eligible to be considered for a Stafford Loan or a Supplemental Loan for Students during one twelve-month period while preparing for a classified program of study.

SATISFACTORY PROGRESS STANDARDS

SIUC requires that a classified graduate student be making satisfactory progress toward a degree if that student wishes to receive financial aid funds. A classified graduate student is making satisfactory progress toward a degree if successfully meeting two basic academic standards. First, a classified graduate student must complete a reasonable number of credit hours attempted each academic year in attendance. Second, a classified graduate student must maintain a scholastic standing, derived from grades, that allows for continued enrollment at the University under current academic guidelines. The following parameters will be used to define these two basic academic standards.

1. Maximum Time to Graduate: A student's eligibility is terminated after the academic year in which a cumulative total of 120 master's hours — 140 hours for the Master of Fine Arts degree — or 140 doctoral hours is attempted. A graduate student must complete at least 50% of the credit hours attempted during any year. The student's progress will be measured annually after spring semester to determine the progress made for the last academic year of attendance.

2. Grades: A student must be in compliance with the University's policy concerning academic standing, grades, and grade point average, as defined under the topic "Retention" and all other provisions in the current Graduate Catalog. A graduate student who is academically suspended from the Graduate School is not making satisfactory progress.

A classified graduate student who does not meet both of the standards set forth above and has been provided a probationary period or who cannot show mitigating circumstances is not maintaining satisfactory progress toward a degree and is no longer eligible to receive federal financial aid funds. (See Appeal for Mitigating Circumstances.)

Nothing in this policy shall be construed as a reduction of external requirements by other federal, state, public, or private agencies when they award or

control financial aid. Examples of such agencies are: Veterans Administration, Vocational Rehabilitation, and the NCAA.

Definitions

Credit Hours Attempted shall be defined as those credit hours for which a student is registered and will receive a grade from SIUC.

Credit Hours Completed for the purpose of the policy shall be defined as the total number of academic credit hours for which a graduate student receives any grade from SIUC other than failing, withdrawal, unsatisfactory, or audit. Incomplete and deferred grades count as credit hours completed.

Eligible Students shall be defined as those classified graduate students who are admitted to the Graduate School and to a specific degree program.

Grade Point Average (GPA) is defined in the Graduate Catalog under the topic "Retention".

Notification of Ineligible Status

It shall be the responsibility of the Graduate School to publish this policy and to notify by letter any graduate student who is no longer eligible to receive financial aid funds. Said notices shall be addressed to the graduate student's most current permanent address on file with the University. IT SHALL BE THE RESPONSIBILITY OF THE STUDENT TO INFORM THE UNIVERSITY OF A CORRECT PERMANENT ADDRESS AT ALL TIMES. The Financial Aid office will provide the Graduate School with a list of graduate students who are no longer eligible to receive federal or applicable state financial aid.

Reinstatement

Graduate students will have their eligibility to receive financial aid reinstated when they have reached the level of satisfactory progress required of them by this policy. They may achieve this status by the correction of incorrect grades, or by completing the required number of attempted hours during the next academic year of enrollment without the benefit of applicable financial aid.

Satisfactory Progress Probationary Period

A graduate student who has not met the satisfactory progress requirements specified above will be granted an extension for the following calendar year and will remain eligible for financial aid during this period. At the end of the probationary period, the student must have rectified the deficiency and be in compliance with all other established criteria in order to be considered eligible for federal financial aid. Only one such probationary period will be granted a student during graduate studies.

Appeal for Mitigating Circumstances

A graduate student shall have the opportunity to appeal in writing to explain mitigating circumstances. The appeal should be sent to the Graduate School within 15 days of receipt of the notice of ineligible status. The Graduate School will review the mitigating circumstances documented in the appeal and provide a written decision within 20 days after the receipt of the appeal.

The Graduate School will provide written notification to the Financial Aid Office concerning all graduate students who have been granted an exception for mitigating circumstances.

Tuition and Fees

Tuition and fees charged students are established by the Board of Trustees and are subject to change whenever conditions necessitate. All assessments are on a

per-hour basis, with 12 hours considered full time. Students will be assessed the following tuition and fees each term:

Graduate Student Tuition and Fee Schedule

Semester Hours Enrolled	Illinois Residents Tuition	Student Fees	Total	Non-Illinois Residents Tuition	Student Fees	Total
1	$ 65.00	$192.39	$257.39	$195.00	$192.39	$307.50
2	130.00	209.78	339.78	390.00	209.78	599.78
3	195.00	227.17	422.17	585.00	227.17	812.17
4	260.00	244.56	504.56	780.00	244.56	1024.56
5	325.00	261.95	586.95	975.00	261.95	1236.95
6	390.00	279.34	669.34	1170.00	279.34	1449.34
7	455.00	296.73	751.73	1365.00	296.73	1661.73
8	520.00	314.12	834.12	1560.00	314.12	1874.12
9	585.00	331.51	916.51	1755.00	331.51	2086.51
10	650.00	348.90	998.90	1950.00	348.90	2298.90
11	715.00	366.29	1081.29	2145.00	366.29	2511.29
12 or more	780.00	383.90	1163.90	2340.00	383.90	2723.90

The fees which have been established by the Board of Trustees are payable by all students unless they are specifically exempted by the Board of Trustees. All fees are considered to be institutional in nature and require payment regardless of whether or not the student receives direct benefits or is in a location which permits access to such benefits.

Student fees include: Student Center fee, student activity fee, athletic fee, revenue bond fee, and student medical benefit fee. A microfilming fee of $55 is required of all doctoral students at the time the dissertation is submitted for approval. If copyright is desired, an additional fee of $25 is required. (Additional fee information is available in the schedule of classes.) Student fees include the following.

Student Center Fee. Provides funds for the operation of the Student Center.

Student Activity Fee. Provides funding for student organizations and activities on campus.

Athletic Fee. Provides partial funding for the university intercollegiate athletic program.

Revenue Bond Fee. Replaces funds which were previously obtained from tuition payments and used to under-write the funded debt operations of the Student Center and university housing.

Student Medical Benefit Fee. Provides funding for a comprehensive student health program including emergency service; hospitalization; specialty, primary, intermediate, or infirmary care; and prevention program. A student who pays this $45.00 fee is entitled to full medical benefits at the Health Service. One who has comparable coverage may seek a refund within the first three weeks of each semester by contacting the administrative director of the Health Service. Similarly, a refund is authorized for those students precluded from use of the student health program by unusual or extreme geographic considerations.

Additional Fee Information

1. Students should refer to the Schedule of Classes for specific fee information.

2. Permanent full-time or permanent part-time employees may be eligible for waiver of tuition and waiver of a portion of the student fees. (Graduate assistants are not eligible for a waiver of student fees.) Approval by the department head and the director of the Personnel office must be given prior to enrolling for courses. Employees who are approved pay only the Students Center fee and the Students' Attorney Program fee.
3. Students taking courses in extension or at approved residence centers are required to pay tuition as listed in the table above but do not pay student fees.
4. Graduate students who have registered for the minimum number of credit hours required for their degree are required to remain registered in continuing enrollment. Refer to the section titled Continuing Enrollment Requirement previously in this chapter for the regulations governing this fee.
5. In addition to the above fees, there is a graduation fee. For further information contact the Office of Admissions and Records. When submitting their dissertations, doctoral students are required to pay a $36.00 fee to cover the cost of publication of the dissertation abstract and microfilming the dissertation. If copyright is desired, an additional fee of $20.00 is required.
6. Students holding valid state scholarships are exempt from the above tuition and fees to the extent provided by the terms of the specific scholarship held. Honorary scholarships, which have no monetary value, may be awarded. An Illinois State Teacher Education Scholarship, an Illinois Military Scholarship, or an Illinois General Assembly Scholarship exempts the student from paying tuition, the student activity fee, and the graduation fee. The Illinois Scholarship for Dependents of Prisoners of War and the Illinois Bilingual Scholarship exempt the student from paying tuition and all mandatory nonrefundable fees.
7. Adult education course fees are computed on the basis of approximately sixty cents per contact hour.
8. Other charges which students may incur are those for departmental field trips, library fines, and excess breakage. Also, students taking a course involving use of materials, as distinct from equipment, will ordinarily pay for such materials.
9. Students registering for courses on an audit basis pay the same tuition and fees as though they were registering for the courses for credit.
10. Out-of-state students will find the official University regulations governing determination of residency status for assessment of tuition later in this chapter.
11. Students enrolled in public service courses only pay tuition and a $3.00 per semester hour fee divided equally between the Student Center and the Student Medical Benefit fund.

Payment and Refunding of Tuition and Fees

Tuition and fees are payable each semester during the academic year. Students who register in advance receive a Statement of Account in the mail and may pay either by mail or in person at the Bursar's office, by the deadline date, in accordance with instructions accompanying the statement. Otherwise their advance registration is cancelled and they must register again later. Students who register at the start of a semester must pay tuition and fees according to the schedule which is in effect at that time. Students should read the *Schedule of Classes* for specific information on payment of tuition and fees.

Students who process a program change which places them in a different tuition and fee category than the one for which they originally registered will be billed additional tuition and fees when appropriate. If the change places them in a smaller tuition and fee category and if they have processed the program

change within the first three weeks of the semester, they will receive an automatic credit to their account.

A credit for tuition and fees will be made to student accounts for students who officially withdraw from school by the withdrawal deadlines listed later in this chapter. They will receive a refund check in approximately four weeks after the withdrawal has been received by the Office of Admissions and Records. No credit for tuition and fees is made for withdrawal occurring after the deadlines, except as described in the next paragraph.

Special consideration is extended to individuals who leave school for extended military service (6 months or longer). Students will be refunded full tuition and fees paid if they enter military service during the first five weeks of school. If students withdraw during the sixth through tenth weeks of school, they will be refunded half of the paid tuition and fees, and they will receive one-half credit without letter grades for the courses in which they were receiving a passing grade at the time of withdrawal. When the withdrawal occurs after the tenth week, students will receive no refund, but will receive both grades and credit hours for the courses in which they are passing. In all instances, a copy of the military orders or a letter from the commanding officer is required for verification of impending military service. To be eligible for these benefits students must remain in school to within ten days of their military reporting date.

Deferment of Tuition and Fees

Students who are experiencing a delay in the receipt of verified financial assistance through the Financial Aid office may be eligible for a cancellation waiver. If granted, a cancellation waiver prevents a student's registration from being cancelled even though tuition and fees have not been paid by the publicized cancellation date.

Information concerning cancellation waiver procedures is available from the Financial Aid office and the office of the Graduate School. This information is also published in the *Daily Egyptian* each term. Guidelines may vary from term to term and year to year so students are advised to seek out accurate information rather than assume they qualify.

Determination of Residency Status

For the purpose of these regulations an *adult* is considered to be a student eighteen years of age or over; a *minor* student is a student under eighteen years of age. The term "the State" means the State of Illinois except in the following instances: (1) for the purposes of assessing graduate tuition, the president may take the term "the State" to include the Kentucky counties of Ballard, Caldwell, Calloway, Carlisle, Crittenden, Fulton, Graves, Hickman, Livingston, Lyon, McCracken, Marshall, Trigg, and Union. (2) For the purposes of assessing graduate tuition for not more than six hours the president may take the term "the State" to include the State of Missouri. Graduate students who take more than six hours per term will be charged out-of-state tuition for all semester hours taken during the term. Except for those exceptions clearly indicated in these regulations, in all cases where records establish that the person does not meet the requirements for Resident status as defined in these regulations the nonresident status shall be assigned.

Evidence for determination of residence status of each applicant for admission to the University shall be submitted to the Director of Admissions at the time of application for admission. A student may be reclassified at any time by the University upon the basis of additional or changed information. However, if the University has erroneously classified the student as a Resident, the change in tuition shall be applicable beginning with the term following the reclassification; if the University has erroneously classified the student as a nonresident, the change in tuition shall be applicable to the term in which the reclassification oc-

curs, provided the student has filed a written request for review in accordance with these regulations. If the University has classified a student as a Resident based on false or falsified documents, the reclassification to nonresident status shall be retroactive to the first term during which residency status was based on the false or falsified documents.

Adult Student. An adult, to be considered a Resident, must have been a bona fide resident of the State for a period of at least three consecutive months immediately preceding the beginning of any term for which the individual registers at the University, and must continue to maintain a bona fide residency in the State, except that an adult student whose parents (or one of them if only one parent is living or the parents are separated or divorced) have established and are maintaining a bona fide residence in the State and who resides with them (or the one residing in the State) or elsewhere in the State will be regarded as a Resident student.

Minor Student. The residence of a minor shall be considered to be, and to change with and follow:

a. That of the parents, if they are living together, or the living parent, if one is dead; or
b. If the parents are separated or divorced, that of the parent to whom the custody of the person has been awarded by court decree or order, or, in the absence of court decree or order, that of the parent with which the person has continuously resided for a period of at least three consecutive months immediately preceding registration at the University; or
c. That of the adoptive parents, if the person has been legally adopted and, in the event the adoptive parents become divorced or separated, that of the adoptive parent whose residence would govern under the foregoing rules if that parent had been a natural parent; or
d. That of the legally appointed guardian of the person; or
e. That of the *natural* guardian, such as a grandparent, adult brother or adult sister, adult uncle or aunt, or other adult relative with whom the person has resided and by whom the student has been supported for a period of at least three consecutive months immediately preceding registration at the Univérsity for any term, if the person's parents are dead or have abandoned him and if no legal guardian of the person has been appointed and qualified.

Parent or Guardian. No parent or legal or natural guardian will be considered a resident of the State unless said person (a) maintains a bona fide and permanent place of abode within the State, and (b) lives, except when temporarily absent from the State with no intention of changing the legal residence to some other State or country, within the State.

Emancipated Minor. If a minor has been emancipated, is completely self-supporting, and actually resides in the State, the minor shall be considered to be a Resident even though the parents or guardian may reside outside the State. An emancipated minor who is completely self-supporting shall be considered *to actually reside in the State of Illinois* if a dwelling place has been maintained within the State uninterruptedly for a period of at least three consecutive months immediately preceding term registration at the University. Marriage or active military service shall be regarded as effecting the emancipation of minors, whether male or female, for the purposes of this regulation. An emancipated minor whose parents (or one of them if only one parent is living or the parents are separated or divorced) have established and are maintaining a bona fide residence in the

State and who resides with them (or the one residing in the State) or elsewhere in the State will be regarded as a Resident student.

Married Student. A nonresident student, whether male or female, or a minor or adult, or a citizen or noncitizen of the United States, who is married to a resident of the State, may be classified as a Resident so long as the individual continues to reside in the State; however, a spouse through which a student claims residency must demonstrate residency in compliance with the requirements applicable to students seeking Resident status.

Persons without United States Citizenship. A person who is not a citizen of the United States of America, to be considered a Resident, must have permanent resident status with the United States Immigration and Naturalization Service and must also meet and comply with all of the other applicable requirements of these regulations to establish Resident status.

Armed Forces Personnel. A person who is actively serving in one of the Armed Forces of the United States and who is stationed and present in the State in connection with that service and submits evidence of such service and station, shall be treated as a Resident as long as the person remains stationed and present in Illinois. If the spouse or dependent children of such member of the Armed Forces also live in the State, similar treatment shall be granted to them.

A person who is actively serving in one of the Armed Forces of the United States and who is stationed outside the State may be considered a Resident only if the individual was a resident of the State at the time of entry into military service.

A person who is separated from active military service will be considered a Resident of Illinois immediately upon separation providing the person: (a) was a resident of the State at the time of enlistment in the military service, (b) became treated as a Resident while in the military by attending school at Southern Illinois University while stationed within the State, or (c) has resided within the State for a period of three months after separation.

State and Federal Penitentiary. A person who is incarcerated in a State or Federal place of detention within the State of Illinois will be treated as a Resident for tuition assessment purposes as long as said person remains in that place of detention. If bona fide residence is established in Illinois upon release from detention, the duration of residence shall be deemed to include the prior period of detention.

Minor Children of Parents Transferred Outside the United States. The minor children of persons who have resided in the State for at least three consecutive months immediately prior to a transfer by their employers to some location outside the United States shall be considered Residents. However, this shall apply only when the minor children of such parents enroll in the University within five years from the time their parents are transferred by their employer to some location outside the United States.

Dependents of University Employees. For the purposes of tuition assessment, all faculty, staff (including civil service employees), and graduate assistants, as well as their spouses and dependent children, shall be considered as resident students.

Definition of Terminology. To the extent that the terms *bona fide residence*, *independent*, *dependent*, and *emancipation* are not defined in these regulations, definitions shall be determined by according due consideration to all of the facts

pertinent and material to the question and to the applicable laws and court decisions of the State of Illinois.

A bona fide residence is a domicile of an individual which is the true, fixed, and permanent home and place of habitation. It is the place to which, whenever absent, the individual has the intention of returning. Criteria to determine this intention include but are not limited to year around residence, voter registration, place of filing tax returns (home state indicated on federal tax return for purposes of revenue sharing), property ownership, driver's license, car registration, vacations, and employment.

Procedure for Review of Residency Status or Tuition Assessment. A student who takes exception to the residency status assigned or tuition assessed shall pay the tuition assessed but may file a claim in writing to the appropriate official for a reconsideration of residency status and an adjustment of the tuition assessed. The written claim must be filed within 30 school days from the date of assessment of tuition or the date designated in the official University calendar as that upon which instruction begins for the academic period for which the tuition is payable, whichever is later, or the student loses all rights to a change of status and adjustment of the tuition assessed for the term in question. If dissatisfied with the ruling in response to the written claim made within said period, the student may appeal the ruling to the president or his/her designee by filing with the appropriate official within twenty days of the notice of the ruling a written request.

UNIVERSITY EMPLOYEES

All full-time University employees who wish to use the employee tuition and fee waiver (civil service and faculty) who are classified as graduate students must seek approval of the Graduate School to enroll in more than six semester hours of courses.

Faculty and Staff

Members of the faculty who are seeking this waiver of tuition and some fees, must apply each term for the waiver by completing an Application for Waiver of Tuition/Fees for Faculty form. Waiver application forms may be obtained from the Personnel office or from the graduate registration area, Admissions and Records, Woody Hall, A14. The form should be filled out promptly each term and may be turned in at the graduate registration area or may be mailed to the Personnel office. The amount of the waiver will be automatically credited to the student's account after the faculty status is verified and the application form is processed.

Note that the waiver does not cover the Student Center fee, which must be paid by the student prior to the payment deadline in order to avoid cancellation of the registration.

Employees in faculty-administrative positions will receive a tuition credit and credit applied toward some fees whenever they are employed at any time during a semester for which they are registered. If the appointment is at least a nine-month appointment, students may receive the tuition-fee credit for an additional semester which must follow immediately the last semester of appointment. Students may option summer or fall in this instance.

Civil Service

Employees in permanent civil service positions will receive a tuition credit and credit applied toward some fees only when authorized by the Personnel office after compliance with personnel regulations. However, civil service employees expecting a waiver of tuition and fees must process a Civil Service Tuition and

Fee Waiver form through the Personnel office before registering. If the Personnel office approves the request, the student's account will then be credited with the amount of the waiver.

Note that the waiver does not cover the Student Center fee, which must be paid by the student prior to the payment deadline in order to avoid cancellation of the registration.

OTHER TYPES OF REGISTRATION IN GRADUATE COURSES

The following discussion concerns students who are either unclassified for various reasons or are undergraduates wanting to take graduate-level courses.

Unclassified Students—Non-Degree

A person may apply for admission to the Graduate School as an unclassified student when the applicant does not seek a graduate degree or has applied too late to be admitted to a degree program for the term for which admission is sought.

If an unclassified student is admitted to a degree program at a later time, the director of that program may petition the graduate dean that graduate courses completed while the student was unclassified be applied toward fulfillment of degree requirements. The student will be subject to the rules and regulations of the Graduate School and the department concerned including the completion of at least 9 hours after being admitted to a master's degree program from unclassified status.

Unclassified students are not eligible for fellowships, assistantships, or tuition scholarships.

Regular Unclassified

A person who seeks admission as a regular unclassified graduate student must have been awarded a bachelor's or higher degree. A student admitted as a regular unclassified student may enroll in graduate courses as long as the student meets retention standards of the Graduate School.

Late-Entry Unclassified

An applicant to a degree program who meets Graduate School admission standards but whose materials are received too late for processing may be granted late-entry, unclassified status for the term for which admission was originally sought. The application papers will continue to be processed for admission to a degree program for the term following the one originally applied for. Whether or not work taken by a student who is unclassified because of late application will later count toward a degree will be decided by the Graduate School and the department concerned.

Temporary Unclassified (On-Campus)

An applicant who wishes to enroll for one term only or who has applied for admission too late to furnish official transcripts required by the Graduate School may be admitted as a temporary unclassified student. The applicant must sign a special registration form affirming possession of a bachelor's degree. No transcript is required.

A student may register as a temporary unclassified student for one semester only. If the student wishes to enroll in graduate courses after this time period, the student must apply for and be admitted, either to a degree program or to regular unclassified status.

Temporary Unclassified (Off-Campus)

For off-campus students (courses with sections in the 800s) more than one semester's registration will be allowed in the temporary unclassified status.

These registrations should not accumulate to more than 12 hours total before a student is required to apply for admission to a program or for regular unclassified status.

Undergraduate Student Registration in Graduate Courses

GRADUATE CREDIT

An undergraduate student who wishes to register for a graduate course (400- or 500-level course) for graduate credit must file the standard application for admission to the Graduate School and submit to the graduate dean a request for graduate credit. Forms are available in the Graduate School. If the student is academically eligible for admission to a degree program, the student will be allowed to register as an undergraduate for graduate courses for graduate credit when within 12 semester hours of completing requirements for the bachelor's degree.

An undergraduate student who meets these qualifications will be allowed to take graduate courses for graduate credit for one semester or one summer term. If, at the end of the term, the student has not received the bachelor's degree, permission to enroll in graduate courses for graduate credit will be withdrawn until after the bachelor's degree has been conferred.

UNDERGRADUATE CREDIT

The Graduate School has the responsibility of approving the registration of undergraduate students in 500-level courses for undergraduate credit. Undergraduate students should only be encouraged to take 500-level courses if they are properly qualified. In dealing with these requests the following procedures must be followed.

The chair of the department offering the course, in collaboration with the instructor who is teaching the particular course, should forward a letter to the graduate dean indicating their approval for this student to enroll in the 500-level course for undergraduate credit. Since such a request should only be made for superior students, the letters should include such information as: (1) undergraduate GPA; (2) general description of the student's academic work; and (3) why this course would be beneficial. The student must stop by the Graduate School to obtain permission to enroll upon receipt of the letter by the graduate dean. If permission to enroll has been granted by the graduate dean, this will be indicated to the registration center. Accordingly, the student should bring the request form or add/drop slip to the Graduate School.

Additional Information

Residence-Center Credit

Credit earned at approved graduate residence centers and credit earned in off-campus courses for which graduate credit has been approved will be entered on a student's record as on-campus credit earned at SIUC.

Students enrolled for credit in approved residence-center master's degree programs or in specific residence-credit courses must have been officially admitted (either in a degree program or unclassified) to the Graduate School at SIUC.

For information about specific programs and courses, the student should consult the appropriate department.

Transfer Credit

All graduate credits earned by a student in good standing at an accredited university, which have not been applied toward fulfillment of requirements for another degree, are eligible for transfer to that student's degree program, subject to

general limitations of Graduate School regulations, to residency requirements for doctoral degree programs, and to acceptance by the student's major department. All transfer credits are subject to final review by the graduate dean. No transfer credit will be given for work bearing a grade below *B* without express permission of the graduate dean in response to written petition from the student's department. No credit toward a degree may be earned by correspondence nor in extension courses at another university. In the case of a master's degree, the student must earn at least half of the credit applied toward fulfillment of degree requirements in courses offered by SIUC.

The department recommending the graduate degree shall administer all required general and final examinations, and a member of the graduate faculty at SIUC shall direct the student's master's thesis, required research paper, or doctoral dissertation.

Graduate Grading System

A Excellent. 4 grade points.
B Good. 3 grade points.
C Conditional, not fully satisfactory. 2 grade points.
D Poor, not satisfactory. 1 grade point.
F Failure. 0 grade points.
S Satisfactory. Used for thesis and dissertation credit and certain designated and approved 500-level research, internship, and practicum courses. Is not counted in calculating grade-point average.
U Unsatisfactory. Used for thesis and dissertation credit and certain designated and approved 500-level research, internship, and practicum courses. Is not counted in calculating grade-point average.
W Authorized withdrawal made through a program change. Work may not be completed. Refer to grade explanation below.
INC Incomplete. Has permission of the instructor to be completed within a period of time designated by the instructor. Refer to grade explanation below.
DEF Deferred. Used only for certain designated and approved 500-level courses of an individual continuing nature such as research, thesis, or dissertation. Refer to grade explanation below.
AU Audit. No grade or credit earned. Refer to grade explanation below.

Grading System Explanation

Only courses for which the grades of *A*, *B*, *C*, or *S* have been received are acceptable in fulfillment of graduate degree requirements. The letter grades *A*, *B*, *C*, *D*, and *F* are included in computing the grade-point averages for academic retention. If a graduate student repeats a course with the permission of the graduate dean, both grades will be counted in the grade-point average. Graduate students will not receive graduate credit for Pass/Fail grades. They may not receive a grade of Pass/Fail in a 400-level course graded Pass/Fail on an elective basis.

400-level courses. Most 400-level courses may be taken for graduate credit. The Graduate Catalog will indicate those 400-level courses which may not be taken for graduate credit. No grades of Pass/Fail may be given for a 400-level course for graduate credit. The instructor in a 400-level course which can be taken for graduate credit has the discretion to decide whether to require additional work for graduate credit.

Withdrawal. A *W* indicates authorized withdrawal from a course prior to the date indicated in the schedule of classes for the term in which the course was taken. The student's record will reflect the courses from which the student had withdrawn with the symbol *W* and the week of withdrawal. Program changes to drop a course during the first three weeks of classes result in no entry being

made on the student's record (consult the section entitled Withdrawal from Courses and from the University for additional information on withdrawal procedures and deadlines).

Incomplete. An *INC* is assigned when, for reasons beyond their control, students engaged in passing work are unable to complete all class assignments. An *INC* must be changed to a completed grade within a time period designated by the instructor. *INC* is not included in grade-point computation.

To complete the work from the original registration, a student should not register for the course again, but should complete the work for the original registration if the original registration is within the normal time limits established for the degree.

Deferred. When the work is completed in a course for which *DEF* has been assigned, the grade is changed to a letter grade by the instructor, except in the case of theses and dissertations. When a thesis or dissertation has been submitted to the Graduate School as approved, the grade is automatically changed to *S*. If a thesis or dissertation is found unacceptable and the student is dismissed from the program, the grade of *U* is automatically assigned upon receipt by the Graduate School of the action dismissing the student.

Audit. A student registering for a course on an audit basis receives no letter grade and no credit hours. The student's registration must indicate audit registration and the same fees are paid as when registering for credit. During the first three weeks of a regular semester a student registered for a course for credit may change to audit status or vice versa through the official program change process. Thereafter, the change may not be made.

Changing of grades. At the completion of a course the final grade assigned to a student is the responsibility of the instructor of the course. Grades given at the end of the course are final and may not be changed by additional work or by submitting additional materials; however, clerical errors in recording grades can be corrected. To correct a clerical error, the assigned instructors should submit a grade change card together with an explanation and justification of the grade change for the approval or disapproval of the department chair, the appropriate college dean, and the dean of the Graduate School. In cases of theses and dissertations, for which *DEF* grades are given, the Graduate School changes the *DEF* grades upon presentation and acceptance of the thesis and dissertation and receipt of the departmental approval papers. In courses for which INC and *DEF* grades have been given, the assigned instructors has the responsibility of determining the final grade to be assigned and notifying the Office of Admissions and Records of the final grade by means of the grade change card.

Student Conduct Code

Refer to the Undergraduate Catalog.

Academic Grievances Policy/Procedures

Graduate students at SIUC shall have the right to appeal for redress of grievance through established channels. Access to these channels is restricted to graduate students who were officially enrolled at the time when the incident that has resulted in the filing of a grievance occurred.

Each academic unit and administrative unit, as described in the Graduate Catalog, should establish a grievance procedure. In general, it is preferable that problems be solved within the University at the level at which they arise. The Graduate School should not be asked to rule on any grievance until prior channels are exhausted.

In general, any question of the character and professional competence of any individual faculty member at SIUC will be considered to be outside the competence of the academic grievance committee* to judge.

Procedure Governing the Academic Grievance Process

Any graduate student may ask for and receive a hearing before an academic grievance committee.** This hearing is available to the student only after appeals procedures which are open to the student at the academic and administrative level at which the conflict arose have been exhausted. An academic grievance committee will be advisory to the dean of the Graduate School and will submit its findings to the dean.

Composition of the Academic Grievance Committee

An academic grievance committee shall consist of five members, and the members of the committee shall be appointed from those colleges/schools having graduate programs. Of those five members, three shall be appointed from the graduate faculty and two shall be appointed from the graduate student body. The dean will seek nominations from the Graduate and Professional Student Council for the graduate student members of a committee and from the Graduate Council for the graduate faculty members of a committee. The dean will designate which colleges/schools will have graduate student members appointed. The committee will be demographically representative of the University insofar as possible. The academic unit from which the grievance arose will not have a member appointed to the grievance committee. An academic grievance committee shall meet and elect its own chair from among its graduate faculty membership.

Filing a Grievance

A graduate student desiring a hearing before an academic grievance committee will submit a written request to the dean of the Graduate School within thirty calendar days after the aggrieved had received the final decision of the person(s) who heard the complaint at the administrative or academic level at which the complaint had arisen. The request must state the following:

1. Name of the aggrieved.
2. Program in which aggrieved is enrolled.
3. Name of the aggrieved's major adviser.
4. Name and title of the person(s) against whom the complaint is lodged.
5. A means of reaching the aggrieved.
6. A statement of the grievance including descriptions of the incident(s) involved and date(s) of occurrence.
7. Summary of grievance proceedings held at the previous administrative or academic level and the decision(s) rendered by the body/administrator before whom that proceeding was held.
8. A statement of why the previous decision was in error.

Graduate Student Grievance Procedures

Upon receiving a written request for a hearing regarding academic grievance, the dean of the Graduate School, in consultation with the Graduate and Professional Student Council and the Graduate Council, shall select an academic grievance committee.

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* Academic grievance committee—An Ad Hoc committee of graduate faculty and graduate students selected by the dean of the Graduate School to review graduate student grievances and advise the graduate dean of appropriate action(s) regarding such complaints.

** Grievances involving sexual harassment will automatically be referred to the Sexual Harassment Policy Board.

The committee shall review the written request to determine whether the record is complete and a decision may be rendered by the committee without additional hearing or whether a hearing should be held. This determination should be sent to the grievant within ten days of receipt of the written request by the committee.

A. If the committee decides that no hearing is required, it shall review the materials submitted by the grievant and render a recommendation of the grievance within twenty working days after notifying the grievant that no hearing will be held. The recommendation of the committee shall be sent to the dean of the Graduate School immediately upon its completion.

B. If the committee determines that a hearing shall be held on the grievance, a hearing should begin within thirty working days after that determination is made. In those cases, the grievant and the parties against whom the grievance is brought shall have equal opportunity to present relevant information relating to the grievance. The hearing shall be conducted by the committee and the following rules and procedures shall be followed:

1. The principal parties to the grievance shall have the right to be accompanied by personal legal counsel or an adviser of their choice. Personal legal counsel/advisers will be permitted to advise their clients in the hearing but may not speak on behalf of their client without prior written approval of the committee.
2. The grievant and the responding parties shall provide to the committee a list of witnesses to be called and copies of any documents which they seek to introduce into evidence at the hearing, copies of which shall be furnished to the opposing party.
3. All hearings shall be open unless either of the parties request that the hearings be closed, in which case it shall be closed. If the hearing is closed, only the parties, their adviser, and the committee shall be present during the talking of evidence. Witnesses for either party shall be present only while giving testimony if the hearing is closed.
4. All hearings shall be tape recorded. The tape recording will be deposited in the office of the dean of the Graduate School at the conclusion of the hearing.
5. The dean of the Graduate School or the dean of the affected college/school will ensure the appearance of those faculty members whose attendance has been requested by the committee.
6. Written statements in lieu of personal testimony may be used only with permission of the committee and only in those cases where the witness is physically unable to attend the hearing. The opposing party shall be given at least three days notice of the fact that an individual will not be physically present to give testimony and may object to the use of written statements. If the committee determines that the actual presence of the witness is required to ensure fairness to all parties, the hearing may be continued until such witness is physically able to attend the hearing.
7. Each party may call witnesses to present evidence. Each party shall have the right to examine any witness called by the opposing party.
8. The committee will decide all matters, procedural and substantive, by simple majority vote.
9. Each party may make an opening statement, no longer than fifteen minutes in length, before the presentation of any evidence. Each party may make a closing argument, no more than thirty minutes, following the conclusion of all evidence.
10. In the absence of compelling circumstance, the committee shall make its recommendation on the grievance to the dean of the Graduate School within fifteen working days after the conclusion of the hearing.

The recommendation of the committee is advisory in nature. The dean of the Graduate School shall decide to accept or reject the committee's recommendations and render a decision on the grievance within ten working days. The decision and the reasons therefore shall be submitted to the parties as well as the committee members within the same time frame. If the dean determines that additional evidence is necessary to decide a grievance, (s)he may remand the grievance to the committee for the taking of further evidence or may make arrangements for additional evidence to be presented within the office of the dean. The dean may limit the issues on which additional information shall be taken. When a grievance is remanded to the committee, the committee shall follow the procedures listed above in paragraph B.

In the event that the grievant does not accept the decision of the dean of the Graduate School, (s)he will be advised as to the next level at which the grievance may be taken.

Graduate School Procedures for Charges of Academic Dishonesty Leading to Possible Rescission of Degree

INTRODUCTION

Charges against a former student relating to acts of academic dishonesty in the submission of graduate degree requirements shall be handled to the extent feasible under the SIUC Student Conduct Code procedures applicable to charges relating to academic dishonesty. The dean of the Graduate School has the responsibility for the formal resolution of charges involving academic dishonesty in Graduate School programs. Since the Student Conduct Code procedures are not in all respects applicable to charges involving an individual no longer enrolled in the University, the following supplemental procedures will be followed for adjudicating such charges.

NOTIFICATION OF CHARGES

Charges against a former student involving allegations of academic dishonesty in the completion of graduate degree requirements shall be initiated by the dean of the Graduate School by letter to the individual, sent certified mail/return receipt requested, stating the specific charges, and the date, time, and place for the hearing, and enclosing a copy of the Student Conduct Code and these procedures. The charge letter shall be mailed no less than 20 business days in advance of the date of the the hearing.

HEARING AGENT

Charges shall be heard by a five-member hearing committee, the members of which shall be appointed from those colleges/schools having graduate programs. Of the five members, three shall be appointed from the graduate faculty and two shall be appointed from the graduate student body. The dean will seek nominations for a committee hearing a case from the Graduate and Professional Student Council for the graduate student members, and from the Graduate Council for the graduate faculty members. The committee will be demographically representative of the University insofar as possible. The academic unit from which the charge arose will not have a member appointed to the hearing committee. Once a hearing committee is constituted it shall meet and elect its own chair from among its graduate faculty membership. The individual charged shall have the right to challenge membership of the hearing committee as provided in the Student Conduct Code.

HEARING PROCEDURES

Hearings shall be conducted in accordance with the formal disciplinary procedures set forth in the Student Conduct Code. In addition, the following procedures shall govern the conduct of the hearing.

1. The individual charged shall have the right to be accompanied by an adviser of his/her choice. An adviser will be permitted to advise the individual in the hearing, and to speak on behalf of the individual and cross-examine witnesses with the consent of the hearing committee.
2. The dean of the Graduate School and the individual charged shall provide to the hearing committee a list of witnesses to be called and copies of any documents which they seek to introduce into evidence at the hearing. The committee chair will furnish copies of these to the other party. Such witness list and documents shall be provided to the hearing committee not less than 10 business days prior to the date scheduled for the hearing, and to the parties not less than 5 business days before the date of the scheduled hearing.
3. All hearings shall be closed unless the individual charged requests that it be open. If the hearing is closed, only the parties, their adviser, and the committee members shall be present during the taking of evidence. Witnesses for either party shall be present only while giving testimony.
4. All hearings shall be tape-recorded. The tape-recording will be submitted along with the entire case record and the committee's findings and recommendations to the dean of the Graduate School following conclusion of the hearing.
5. Each party may make an opening statement before the presentation of any evidence and a closing argument following the conclusion of all evidence.
6. The charges against the individual and witnesses testifying in support thereof shall be presented first. The individual charged shall have the right to respond to the charges and present witnesses and evidence in his/her own behalf.
7. Each party shall have the right to ask questions of any witness called by the other party. Members of the committee may also question witnesses.
8. Written statements in lieu of personal testimony may be used only with permission of the committee and only in the event a witness is physically unable to attend the hearing. The opposing party shall be given notice at least three days prior to the commencement of the hearing of the fact that an individual will not be physically present to give testimony and so that objection may be made to the use of written statements. If the committee determines that the actual presence of the witness is required to insure fairness to all parties, the hearing may be continued until such witness is physically able to attend the hearing.
9. The hearing committee will decide all matters, procedural and substantive, by simple majority vote.
10. In the absence of compelling circumstances, the committee shall make findings and recommendations on the charges to the dean of the Graduate School within 15 business days after the conclusion of the hearing. The dean of the Graduate School shall render a decision, absent compelling circumstances, within ten business days after receipt of the committee's findings and recommendations. The decision and the reasons therefore shall be submitted to the individual charged by certified mail, return receipt requested, and to the committee chair. If the dean determines that additional evidence is necessary to decide the matter(s), the dean may remand the matter to the committee for the taking of further evidence, and in doing so, may limit the issues on which additional evidence may be

taken. When a matter is remanded to the committee, the committee shall follow the procedures set forth above.

SANCTIONS

Sanctions which may be imposed include the completion of any additional academic requirements deemed necessary for continued holding of the degree, or, if it is found that the degree was improperly awarded because of academic dishonesty on the part of the former student in the submission of degree requirements, a recommendation that the degree be rescinded. A recommendation that a degree be rescinded will be made to the president through the vice president for Academic Affairs and Research, and will require final action by the Board of Trustees of Southern Illinois University.

APPEAL

If the individual is not satisfied with the decision of the dean, a written argument stating the reasons for such dissatisfaction may be submitted to the vice president for Academic Affairs and Research within ten business days after the date that delivery of the decision was tendered by the U.S. Postal Service to the individual. Such written argument shall be attached to the dean's decision and remain therewith throughout the remainder of the process.

Retention

Any graduate student whose grade point average falls below 3.00 will be placed on academic probation. Faculty of a degree program-unit may determine its own grade point average requirements (above the grade point minimum for retention in their particular program.) All 400-and 500-level courses taken after a student is admitted to the Graduate School are considered graduate level, unless the course is specifically designated, Not for graduate credit, for all students. Grade point averages for doctoral students are based on graduate credit work completed at SIUC after admission to the doctoral program. Grade point averages for master's degree students and unclassified graduate students are based on all graduate credit work completed at SIUC.

Any graduate student on academic probation whose grade point average remains below 3.0 for two consecutive semesters in which she or he is enrolled, excluding summer sessions, will be permanently suspended from the Graduate School, unless the department and the collegiate dean petition the graduate dean for an exception.

Graduation

Graduation ceremonies are held each year at the end of the spring semester and the summer session. Degree candidates must apply for graduation with the Office of Admissions and Records by no later than the end of the first week of the spring semester or summer session in which the student plans to graduate. Candidates who plan to complete requirements at the end of the fall semester should apply for graduation during the first week of the fall semester. Although there is no ceremony at that time, degree candidates who complete requirements will have the fact that they have completed all requirements for the degree indicated on their academic records. The diploma will be issued at the time of the spring commencement.

Graduation application forms are available in the Office of Admissions and Records and may be obtained by mail by writing that office.

A $15 graduation fee is established for all persons receiving degrees. The fee is payable at the time of application or the fee will be charged to the student's account. The fee does not cover the rental fee for the cap, gown, and hood, or the cost of the invitations. These items are ordered through the University Book Store in the Student Center and questions regarding them should be referred to

the University Book Store. Doctoral students are also required to pay a fee of $55.00 to cover the cost of publication of the abstract and microfilming of the dissertation.

Final, approved copies of research reports, theses, field studies, special project reports, and dissertations are due in the Graduate School office not later than three weeks before graduation. Doctoral students must also submit the microfilming agreement form and the survey form of earned doctorates at the time the dissertation is submitted.

Although attendance at commencement is not compulsory, students who wish to graduate in absentia must notify the Office of Admissions and Records in advance. This information is needed for seating arrangements and for mailing purposes.

Posthumous Degrees

A graduate degree may be awarded posthumously if, before the student's death, work for the degree had substantially been completed. This determination shall be the responsibility of the graduate dean in consultation with the administrative officers and faculty of the degree program in which the student had been enrolled.

Release of Student Information and Issuance of Transcripts

The University follows a policy for release of student information in compliance with federal regulations. More specific information may be obtained from the Office of Admissions and Records or from the Graduate School.

A transcript of the student's official educational record is issued by the Office of Admissions and Records under the following conditions: a transcript is sent, issued, or released only upon a student's request or explicit permission, except that such permission is not required when the University faculty and administrative officials or other educational institutions request transcripts for official purposes.

In addition, requests will be honored from a philanthropic organization financially supporting a student and from a recognized research organization conducting educational research provided the confidentiality of the transcript is protected. One transcript will be issued directly to a student upon request. The transcript will have the statement, *Issued to the Student,* stamped on its face. Transcripts will be sent without charge to recipients other than the student as requested by the student. A transcript will not be sent, issued, or released if a student owes money to the University as verified by the Bursar's office.

University Policy on Sexual Harassment

Southern Illinois University at Carbondale is committed to creating and maintaining a community in which students, faculty, and staff can work together in an atmosphere free of all forms of harassment, exploitation, or intimidation. Sexual harassment, like harassment on the basis of race or religion, is a form of discrimination expressly prohibited by law. It is a violation of Title VII of the federal 1964 Civil Rights Act and Title IX of the Educational Amendments of 1972 and a civil rights violation of the Illinois Human Rights Act.

In addition to being illegal, sexual harassment runs counter to the objectives of the University. When people feel coerced, threatened, intimidated, or otherwise pressured by others into granting sexual favors, or are singled out for derision or abuse because of their gender, their academic and work performance is liable to suffer. Such actions violate the dignity of the individual and the integrity of the University as an institution of learning. Academic freedom can exist only when every person is free to pursue ideas in a non-threatening, non-coercive atmosphere of mutual respect. Sexual harassment is harmful not only to the persons involved but also to the entire University community.

The University will take whatever action is needed to prevent, stop, correct, or discipline behavior that violates this policy. Disciplinary action may include, but is not limited to, oral or written warnings, demotion, transfer, suspension, or dismissal for cause.

Definitions and Examples

Sexual harassment is defined as unwelcome sexual advances, requests for sexual favors, verbal or other expressive behaviors, or physical conduct commonly understood to be of a sexual nature, when:

submission to, or toleration of, such conduct on or off campus is made, either explicitly or implicitly, a term or condition of instruction, employment, or participation in other University activities;

submission to, or rejection of, such conduct is used as a basis for employment or for academic decisions or assessments affecting the individual's status as an employee or student; or such conduct has the purpose or effect of unreasonably interfering with an individual's status as a student or employee or creates an intimidating, hostile, or offensive work or educational environment.

Sexual harassment may involve the behavior of a person of either sex toward a person of the opposite or the same sex. Examples of behavior that would be considered sexual harassment include, but are not limited to, the following:

physical assault;

direct or implied threats that submission to sexual advances will be a condition of employment, work status, promotion, grades, or letters of recommendation;

a pattern of conduct, annoying or humiliating in a sexual way, that includes comments of a sexual nature and/or sexually explicit statements, questions, jokes, or anecdotes;

a pattern of conduct that would annoy or humiliate a reasonable person at whom the conduct was obviously directed. Such conduct includes, but is not limited to gestures, facial expressions, speech, or physical contact understood to be sexual in nature or which is repeated after the individual signifies that the conduct is perceived to be offensively sexual.

Consenting Relationships

Consenting romantic and sexual relationships between a faculty member and a student or between a supervisor and an employee, while not expressly forbidden, are discouraged. Taking note of the respect and trust accorded a professor by a student and of the power exercised by the professor, a relationship between a faculty member and a student should be considered one of professional and client, in which sexual relationships are inappropriate. A similar relationship exists between a supervisor and an employee. The power differential inherent in such relationships compromises the subordinate's free choice. A faculty member or supervisor who enters into a sexual relationship with a student or an employee, where a professional power differential obviously exists, must realize that if a charge of sexual harassment is subsequently lodged, the burden will be on the faculty member or supervisor to prove immunity on grounds of mutual consent.

Relationships between a graduate student and an undergraduate, when the graduate student has some supervisory responsibility for the undergraduate, belong in this category. Among other relationships included are those between a student or employee and an administrator, coach, adviser, program director, counselor, or residential staff member who has supervisory responsibility for that student or employee.

PROTECTION OF THE COMPLAINANT AND OTHERS

No student, faculty member, or staff member may be subjected to any form of reprisal for seeking information on sexual harassment, filing a sexual harassment complaint, or serving as a witness in a proceeding involving a complaint of sexual harassment. Any retaliatory action will be a violation of this policy and will be grounds for disciplinary action. Individuals who believe they have been subjected to reprisal for their participation in a sexual harassment complaint may use the procedures of this policy to seek redress.

PROTECTION OF THE ACCUSED

Accusations of sexual harassment are grievous and can have serious and far-reaching effects on the careers and lives of accused individuals. Allegations of sexual harassment must be made in good faith and not out of malice. Individuals who believe they have been falsely accused of sexual harassment may use the procedures of this policy to seek redress.

RESPONSIBILITY OF SUPERVISORS

Supervisory personnel are charged with maintaining an atmosphere that discourages sexual harassment and ensuring that the University policy is enforced in their areas. Supervisors are directed to discourage all behavior that might be considered sexual harassment and to respond promptly to sexual harassment complaints. University officials who knowingly condone incidents of sexual harassment or instances of reprisal for reporting such complaints will be subject to disciplinary action.

COMPLAINT RESOLUTION OFFICE

The president has assigned responsibility for the administration of this policy to Personnel Services and Labor Relations and has named its executive director as the complaint resolution officer for the University. The complaint resolution officer will disseminate the policy to the University community, devise education and training programs, maintain centralized records of sexual harassment complaints, oversee the grievance process, coordinate the resolution of complaints, and evaluate the effectiveness of the complaint resolution procedures and related educational programs.

For further information about the sexual harassment policy and complaint resolution procedures, you may contact one of the Sexual Harassment Information Centers: Affirmative Action 536-6618; Counseling Center 453-5371; International Programs and Services 453-5774; Ombudsman 453-2411; Personnel Services and Labor Relations 536-3369; Women's Services 453-3655; Women's Studies 453-5141; and Graduate School 453-4540.

2 Academic Programs

The official descriptions of programs leading to graduate degrees are outlined in this chapter. Admission and degree requirements which are listed in Chapter 1 are minimum standards. The student should consult the specific program description for additional criteria imposed by the department.

The titles of degree programs are listed below. The full descriptions, however, are arranged so that in cases where a department offers more than one program the various programs are grouped together under that department. All programs are cross-listed to aid in locating the official description.

Several departments offer one or more concentrations as noted in Chapter 1 within the major, the requirements for these concentrations may be found in the program description.

Accountancy
Administration of Justice
Agribusiness Economics
Agricultural Education and Mechanization
Animal Science
Anthropology
Applied Linguistics
Art
Behavior Analysis and Therapy
Biological Sciences
Business Administration
Chemistry
Cinema and Photography
Civil Engineering and Mechanics
Communication Disorders and Sciences
Community Development
Computer Science
Curriculum and Instruction
Economics
Education (Ph.D.)
Educational Administration
Educational Psychology
Electrical Engineering
Engineering
English
English as a Foreign Language
Foreign Languages and Literatures
  French
  German
  Spanish
Forestry
Geography
Geology
Health Education
Higher Education
History
Historical Studies (Ph.D.)
Journalism
Manufacturing Systems
Mathematics
Mechanical Engineering and Energy Processes
Microbiology
Mining Engineering
Molecular Science
Music
Pharmacology
Philosophy
Physical Education
Physics
Physiology
Plant Biology
Plant and Soil Science
Political Science
Psychology
Public Affairs
Recreation
Rehabilitation Administration
Rehabilitation Counseling
Social Work
Sociology
Special Education
Speech Communication
Statistics
Telecommunications
Theater
Vocational Education Studies
Zoology

Accountancy

The objective of the Master of Accountancy degree program is to provide an opportunity for students to achieve greater breadth and depth in the study of accountancy than is possible in the baccalaureate program. As preparation for a dynamic profession the curriculum fosters clear, logical, and analytical thought processes, effective oral and written communications, and life-long learning skills. Graduates pursue careers as professional accountants in public practice, industry, financial institutions, government, and other not-for-profit organizations.

Admission

Applicants for admission to the program are required to:

1. Complete all requirements for admission to graduate study as specified by the Graduate School.
2. Complete the Graduate Management Admissions Test (GMAT). Information regarding the GMAT is available through: Graduate Management Admission Test, Educational Testing Service, Box 966, Princeton, NJ 08540.

The results of the test must be mailed directly to the associate dean for academic programs, College of Business and Administration.

A non-refundable application fee of $15.00 must be submitted with any application to the accountancy program. Attach your check or money order, payable to Southern Illinois University, to the top of the application form. Do not send cash. Only checks or money orders payable to United States banks will be accepted.

Admission to the program will be based on an undergraduate grade point average of 3.0 preferred; 2.5 minimum (4.0 = *A)* and an acceptable score on the GMAT. The minimum admission total of these two factors will conform to that recommended by the Master of Accountancy degree program advisory committee.

Students whose native language is not English will be required to obtain an acceptable score (presently 550) on the Test of English as a Foreign Language (TOEFL) examination before being admitted to the Master of Accountancy degree program.

Notification of admission to the Master of Accountancy degree program is by letter from the director, Master of Accountancy degree program. This letter must be presented by the student prior to enrollment and registration in the program.

Degree Requirements

The Master of Accountancy degree program consists of at least 30 hours of acceptable course work. At least 15 hours must be in 500 level accounting courses. A student's program will be designed to insure coverage in the 5 areas of accountancy: financial accounting and accounting theory, management and cost accounting, computerized management information systems, financial and operational auditing, and taxation. A specific program will vary depending upon the student's career objectives and interests.

Each student will be required to take the 5 core courses (15 hours) in accountancy, which expand coverage of the professional environment of accounting beyond that required in the baccalaureate program. These courses include such topics as the organization of the profession, its ethics and responsibilities, and the impact of governmental and private sector organizations on current and emerging accounting issues. The 5 core courses in accountancy at the graduate level which must be completed by all students are:

521 Emerging Issues in Accountancy
531 Controllership and Policy
541 Tax Concepts (or Equivalent)
551 Accounting Information System Concepts
561 Professional Dimensions of Accountancy

A student who does not have any undergraduate work in accounting will be required first to make up deficiencies in the following areas: intermediate accounting, cost accounting, tax, accounting information systems, and auditing.

A student must also complete the common body of knowledge requirements specified by the AACSB. A student who has graduated from an undergraduate accredited (AACSB) business school should have met this requirement. A student who has any deficiencies in any areas required by the AACSB will be required to make up these deficiencies before receiving the Master of Accountancy degree.

Graduate accountancy courses from which a student may select to complete the 15 hours beyond the accountancy core requirements are:

522 Financial Accounting Theory
529 Seminar in Financial Accounting
532 Controllership
542 Tax Research and Procedure
543 Corporate Taxation
544 Partnership Taxation
545 Estate Planning
546 Seminar: Selected Tax Topics
552 Accounting Information Systems II
562 Advanced Auditing Topics
571 Not-For-Profit Accounting
590 Seminar In Accounting
591 Independent Study
599 Thesis
601 Continuing Research

After students have completed the accountancy hour requirements, they will select their remaining hours with the advice and consent of their advisers. Such courses will normally be selected from other graduate offerings in the College of Business and Administration. The full-time student who qualifies for the minimum program in terms of course work requirements normally may expect to complete the Master of Accountancy degree in one calendar year (two semesters and one summer session). The professional nature of this program requires that the courses, writing requirements, oral communications, special lectures, case studies, computer applications, colloquia, independent study, and research activities be presented in an integrated manner which stresses the program aspects at all times. This requires serious and extensive personal commitment to the program on the part of all candidates.

In order to meet the graduate requirements the student must obtain a 3.0 grade point average (4.0 = *A)* and obtain a *B* or better in eighty percent of all graduate level courses taken after admission to the M.Acc. program.

Areas of Emphasis

A student who has an undergraduate degree in accounting or one who has satisfied the accounting common body of knowledge may arrange the additional 15 hours of graduate courses beyond the core requirement to form a specific area of emphasis (taxation, information systems, managerial accounting and control, auditing, or not-for-profit accounting). Emphases are developed with the advice and consent of the student's adviser.

3-2 Program

A 3-2 program within the College of Business and Administration and the School of Accountancy is available to qualified students within the college, transfer students, and students majoring in areas other than business. The program permits a student to devote a part of the last 2 years of undergraduate study to fulfilling the foundation course requirements for business and accounting required for the

Master of Accountancy degree. Upon completion of the requirements for the bachelor's degree, the student may apply for admission to the Graduate School and the Master of Accountancy degree program. Students who successfully complete the program would thus have a 5 year program required for certification in some states.

Concurrent J.D. and M.Acc. Program

A student who has been admitted separately to the School of Law and to the M.Acc. program may apply for permission to study concurrently for both the Juris Doctor and Master of Accountancy degrees. This permission must be requested from both the School of Law and the School of Accountancy, ordinarily prior to entry into the second year curriculum of the School of Law.

During the first academic year of concurrent work on the two degrees, the student enrolls only in the first-year law curriculum. In any subsequent academic term, the student may enroll for courses either in the School of Law or in the Master of Accountancy program. A student registered for both law and graduate courses in the same term must enroll for a minimum of 10 hours in law, and 12 semester hours in total, in order to meet A.B.A. residence requirements and the academic requirements of the School of Law.

Completion of the concurrent program requires that the student successfully complete 81 semester hours of law courses and 30 semester hours of courses that meet M.Acc. requirements. Up to 9 semester hours of the 30 may be School of Law courses which are also part of the 81 hours required for the Juris Doctor degree. School of Law courses counting for graduate credit toward the Master of Accountancy degree must be approved by the director of the Master of Accountancy program. Further, no more than 6 of the 30 semester credit hours may be taken in courses at the 400 level for graduate credit.

Other Graduate Degrees Offered by the College

The College of Business and Administration also offers the Master of Business Administration (M.B.A.) degree with specialization in finance, management, and marketing and the Doctor of Business Administration (D.B.A.) degree. Information relative to these degrees may be obtained from the associate dean for graduate programs, College of Business and Administration.

Administration of Justice

The Center for the Study of Crime, Delinquency, and Corrections enjoys both a national and international reputation for quality research and an outstanding educational program. With the many relationships with operating agencies, students are afforded unique opportunities to gain practical experience as an integrated part of their academic work.

A number of opportunities for financial support are offered through the special programs and research projects conducted by individual faculty. In addition there are a number of fellowships offered, for which qualified students are encouraged to apply.

The Center for the Study of Crime, Delinquency, and Corrections offers the Master of Science degree in the administration of justice. This curriculum, a multi- disciplinary study of crime, its causes and settings, and systematic means of reacting to it, prepares students for careers in law enforcement, correctional services and administration, teaching, criminal justice research and planning, and private security management. Augmenting the academic program, research activities provide opportunity for graduate students to work with faculty members conducting research related in the administration of justice and in designing innovative projects in the field. Internship placement is included as a re-

quired component to insure a blending of practical experience with the academic training received by the student.

Admission

Full admission to the graduate program requires at least a 2.7 overall undergraduate average and acceptance by the faculty. Scores on the Graduate Record Examination (aptitude portion only) or the Millers Analogies Test are also required. The Test of Written English will be required as a component of the regular TOEFL exam.

Students who do not have an undergraduate degree in administration of justice should have a minimum of 12 units in sociology, psychology, political science, or other social sciences. In cases where these criteria are lacking, additional selected undergraduate courses may be required for acceptance in this program.

An introductory statistics course which covers at least analysis of variance and least squares estimation is required of all incoming graduate students. This requirement can be satisfied in 2 ways: a) approval by the graduate affairs committee of a course previously taken by the student; or b) successful completion of an approved statistics course during the student's graduate course work.

Requirements

Required Core Courses. All candidates for the Master of Science degree in the administration of justice are required to fulfill 15 hours of core courses. These consist of 2 didactic courses:

AJ 500-3 Foundations of Criminal Justice

AJ 516-3 Scope and Methods of Criminal Justice Inquiry

In addition the student must take one research related course which provides skills that contribute to the generation of knowledge and more thorough utilization of existing information within the student's selected curricular emphasis. Appropriate courses should include quantitative methods such as AJ 517, Seminar in Advanced Quantitative Techniques in Criminal Justice Research; ED PSYC 507 or POLS 503; as well as courses in such areas as accounting, legal research, or computer science. The course to meet this requirement must be approved by the student's graduate adviser. The statistics requirement for incoming graduate students will not satisfy this requirement.

Two of the following 3 courses are also required.

AJ 504-3 Criminological Theory

AJ 562-3 Fundamental Legal Concepts in the Administration of Justice

AJ 584-3 Administration and Management in Criminal Justice

Curricular Emphases

An area of emphasis will be composed of 12 credit hours in addition to the required core courses, of which 6 are required to be selected from among administration of justice offerings (except for the security administration emphasis). Certain Curricular Emphases are required. They include but are not limited to the following:

Juvenile Delinquency. AJ 473-4, 474-3, 578-3; REHB 452-3; SOC 562-4; and other courses approved the student's graduate adviser.

Law Enforcement. AJ 403-3 to 6, 587-3, and other courses approved by the student's graduate adviser.

Security Administration. AJ 450-3; BA 410-3, 440-3, 510-3, 543-3, 450-3; POLS 436-3, 444-3; IT 465-4; and other courses approved by the student's adviser.

Criminal Justice Counseling. AJ 402-3, 472-3, 571-3, 578-3; PSYCH 414-4, 421-3, 431-3, 440-3; REHB 406-3; and other courses approved by the student's graduate adviser.

Correctional Administration. AJ 485-3, 472-3, 588a-3; POLS 436-3, 441-3, 443-3, 542-3, 543-3, 544-3, 545-3; REHB 570-3, 573-2 to 3, 579-3; SOC 475-4, 539-4; and other courses approved by the student's graduate adviser.

Research in Criminal Justice. AJ 517-3, 580-3, 588b-3, and other courses as appropriate to the student's area of research and approved by the student's graduate adviser.

The Master of Science degree is thus broadly conceived so the student can seek an individualized emphasis appropriate either to continued graduate studies or a particular field of work.

Supervised Field Work. Supervised field work (internship) is required for all areas of emphasis. Students may take a total of 12 hours internship; however, only 6 hours may be counted toward the credit hours required for the master's degree.
AJ 595A-3 to 6 Supervised Field Work (internship) graded *S/U*
AJ 595B-3 to 6 Supervised Field Work (internship) letter graded

Students may successfully complete their graduate degree by pursuing either a thesis or non-thesis option.

Thesis Option

Students choosing the thesis option may take a total of 6 thesis credit hours (AJ 599-1 to 6); however, only 3 hours are counted towards the 36 credit hours required for the master's degree in this option. An oral defense of the student's thesis is required in this option.

Non-Thesis Option

Students choosing the non-thesis option may take a total of 6 individual research credit hours (AJ 591-1 to 6); however, only 3 hours are counted towards the degree requirements. Students in this option are also required to take an additional 3 hours in their curriculum emphasis, making a total of 15 hours of electives. Thus, 39 total credit hours are required in this option. Students pursuing this option are required to publicly defend their internship report and complete a written examination in lieu of an oral defense of their thesis.

Application forms for both the Graduate School and the Department of Administration of Justice must be separately submitted. Upon request to the department, application forms from the Graduate School and the department will be sent. Acceptance in the program is contingent on the final approval of the administration of justice graduate affairs committee after admission to the Graduate School.

More detailed descriptions of the graduate program, as well as information on graduate assistantships and fellowships, may be obtained by writing: Graduate Secretary, Center for the Study of Crime, Delinquency, and Corrections, Southern Illinois University at Carbondale, Carbondale, IL 62901.

Agribusiness Economics

The Department of Agribusiness Economics offers graduate work leading to the Master of Science degree with a major in agribusiness economics.

Students interested in agricultural economics at the doctoral level can be admitted to a program of study leading to the Ph.D. degree in economics.

Application forms for admission to the Graduate School may be obtained from the Graduate School. For entering graduate students to be acceptable on an unconditional basis in the agribusiness economics Master of Science degree program, a minimal undergraduate grade point average of 2.7 is required. Students may be accepted on a conditional basis if the GPA is below 2.7.

Inquiries for financial assistance and additional information would be directed to the chair of the Department of Agribusiness Economics, Southern Illinois University at Carbondale, Carbondale, IL 62901.

Agribusiness Economics Concentration

Emphasis may be attained in farm management, agricultural marketing, agricultural prices, agricultural policy, resource economics, and agribusiness management and finance.

Undergraduate competence in economics and agricultural economics must be demonstrated. Students with an insufficient background in economics or agricultural economics may be admitted if remedial courses are taken.

A minimum of 30 hours of graduate credit, including a thesis, is required for the Master of Science degree major in agribusiness economics with a concentration in agribusiness economics. At least 15 hours must be at the 500 level.

Thirteen hours of agribusiness economics courses are required. This includes ABE 500a, 500b, 551, 552, and 581. In addition, the student's program is oriented toward either economics or business. The emphasis in economics is accomplished by completing six hours of graduate level courses in the Department of Economics. The emphasis in business is accomplished by completing six hours of graduate level courses in the College of Business and Administration. Such work completed as part of an undergraduate degree may be accepted in meeting the economics or business program requirements. This enables students with strong backgrounds in economics or business to take additional agribusiness economics courses or courses in their area of interest to meet the 30 hour M.S. degree requirement. Students are required to take 3–6 hours of thesis.

Agricultural Services Concentration

The agricultural services concentration is designed to permit students who are engaged in agriculture as extension workers, as soil conservation employees, in mechanization related industries, agricultural environmental service, etc., to expand their educational experiences in light of current and prospective employment goals and opportunities.

A minimum of 30 hours of graduate credit, including a thesis, is required for the Master of Science degree major in agribusiness economics with a concentration in agricultural services. At least 15 hours must be at the 500 level. Fifteen hours must be agricultural courses. Students are required to take 3–6 hours of thesis.

Agricultural Education and Mechanization

The Department of Agricultural Education and Mechanization offers graduate work leading to the Master of Science degree majoring in agricultural education and mechanization with concentrations in agricultural education, agricultural mechanization, and agricultural information.

Students interested in agricultural education at the doctoral level can be admitted to a program of study leading to the Ph.D. in education.

Application forms for admission to the Graduate School may be obtained from the Graduate School. For entering graduate students to be acceptable on an unconditional basis in the agricultural education and mechanization concentrations for the Master of Science degree program, a minimal undergraduate grade point

average of 2.7 is required. Students may be accepted on a conditional basis if the GPA is below 2.7.

Inquiries for financial assistance and additional information should be directed to the chair of the Department of Agricultural Education and Mechanization, Southern Illinois University at Carbondale, Carbondale, IL 62901.

Agricultural Education Concentration

The concentration in agricultural education is designed for instructors in secondary schools, for students preparing for employment at junior colleges, and for those desiring to continue their education by obtaining a Ph.D. degree.

A minimum of 30 hours of graduate credit, including thesis or research hours is required for the M.S. degree major in agricultural education and mechanization with a concentration in agricultural education. At least 15 hours must be at the 500 level.

A minimum of 15 hours is required in agriculture (including agricultural education), six hours of research methods or statistics, and six hours in education or community development. M.S. students usually take 4–6 hours of research or thesis, and complete the additional hours by taking courses in education or agriculture.

Agricultural Mechanization Concentration

The concentration in agricultural mechanization is designed to permit students interested in agricultural mechanization the opportunity to emphasize one or more of the following areas: (a) power and machinery operation and field testing, (b) product handling, processing, and storage, (c) farm equipment sales, service, and product education, (d) machinery selection and efficient utilization in the farming operation, (e) agricultural structures—sales and construction supervision, (f) agricultural electricity—service and consumer advisement, (g) conservation of soil and water. Each of these areas offers application in agricultural environmental studies.

A minimum of 30 hours of graduate credit, including thesis or research hours is required for the Master of Science degree with a major in agricultural education and mechanization with a concentration in agricultural mechanization. At least 15 hours must be at the 500 level.

Agricultural Information Concentration

The agricultural information concentration is designed to provide graduate training for extension agents, agricultural communication professionals, product-education specialists, and others who are interested in agricultural information processing and transfer to a variety of non-student clientele.

A minimum of 30 hours of graduate credit, including thesis or research hours, is required for an M.S. degree with a major in agricultural education and mechanization with a concentration in agricultural information. At least 15 hours must be at the 500 level. Fifteen hours must be agricultural courses. Students usually take 4–6 hours of research or thesis and complete the additional hours by taking courses in their concentration.

Animal Science

The Department of Animal Science, Food and Nutrition offers programs of study leading to the Master of Science degree with a major in animal science. Programs may be designed in the various disciplines of breeding, nutrition, reproduction, physiology, growth and development or production, with emphasis on beef cattle, dairy cattle, horses, poultry, sheep, or swine. Supporting courses may

be selected in applied science, chemistry, microbiology, physiology, zoology, behavioral science, agriculture, etc.

Admission to programs administered by the Department of Animal Science, Food and Nutrition must be approved by the department. Application and reference forms will be provided upon request from the department. Applicants must have the registrar of each college previously attended send official transcripts directly to the Graduate School.

Requirements

Minimum requirements for the master's degree may be fulfilled by satisfactory completion of 30 semester hours of graduate credit, with a minimum of 15 hours in animal science. A maximum of two animal production related courses (409, 419, 420, 430, 455, 465, 480, 485) may be counted for graduate credit. At least 8 hours of graduate credit must be earned outside the College of Agriculture. Minimal requirements for students entering the master's degree program are: (a) meet animal science undergraduate requirements; (b) minimal GPA of 2.7 (*A* = 4.0); (c) CHEM 344 and 345 or organic chemistry equivalent.

Students who do not meet the undergraduate requirements may correct these deficiencies while an unclassified student or with the consent of the department during graduate study. Students entering the animal science graduate program with a GPA below 2.70 are accepted on a conditional basis and must enroll in 8 hours of structured courses at the 400–500 level during their first semester and make a 3.0 GPA or be dropped from the program.

Each student, whether in the thesis or non-thesis option, will have an advisory committee of at least four members including the departmental chair and at least one other member of the department. Each master's degree candidate must pass a comprehensive oral examination covering all graduate work including the thesis or research paper.

Students interested in animal science at the doctoral level can be admitted to a program of study leading to the Ph.D. degree in physiology. The program, in the Department of Physiology, is adequately flexible to allow students to emphasize such areas as behavioral science, endocrinology, metabolism, microbiology, physiological genetics, or reproductive physiology. For admission requirements and program description the student should consult the physiology section in the *Graduate Catalog.*

Information concerning admission policies, requisites for graduation, and availability of financial assistance for graduate study in animal science may be obtained from the Department of Animal Science, Food and Nutrition, Southern Illinois University at Carbondale, Carbondale, IL 62901.

Anthropology

The Department of Anthropology offers graduate programs leading to the Master of Arts and Doctor of Philosophy degrees. Within the Master of Arts degree program, the department offers a concentration in conservation archaeology. Provided the student has been admitted to the Graduate School and meets its requirements, acceptance and continuation in the graduate program are at the discretion of the Department of Anthropology.

The philosophy of the Department of Anthropology is to produce students with broad backgrounds in the major sub-fields of anthropology and expertise in particular specialty areas. Within this philosophy, and subject to the requirements discussed below, the department offers a flexible program which will serve students with diverse needs and goals.

Admission

The applicant to the anthropology program must send a completed application for admission to graduate study and certified copies of all transcripts directly to the department, and must meet all Graduate School requirements for entry. A TOEFL score of 600 or higher is required of all foreign students, except those from English-speaking countries. In addition, the applicant must send a completed personal data sheet and a statement of academic and professional goals, and arrange for three letters of recommendation to be sent to the director of graduate studies of the Department of Anthropology. Applicants interested in financial aid must also submit an application for graduate assistantships and fellowships. All necessary forms will be provided to applicants by the department. No special program of previous work is required. Applicants with academic degrees in fields other than anthropology are encouraged to apply.

Master's Degree Program

In addition to the master's degree requirements specified in the Graduate Catalog, the following departmental requirements apply to all M.A. degree candidates: (1) Each student must complete the 5 core courses, ANTH 400A, B, C, D, and 409, with an average grade of *B* or higher, no more than one *C,* and no grade lower than *C.* These courses should be taken by new M.A. students within the first 2 terms, and must be completed by the end of the third term. Once the 5 core courses have been satisfactorily completed, performance in them together with an evaluation of the student's overall academic record will serve as a basis for departmental decision on retaining a student in the M.A. degree program. (2) Each student must complete 1 or more regular graduate-level courses or seminars in each of 3 subdisciplines of the student's choice (from among archaeological, linguistic, physical, sociocultural anthropology). (3) A further 6 hours of course work will be assigned by the student's committee after consultation with the student. These 6 hours may include up to 4 hours of graduate credit to meet tool requirements, and may not include more than 3 hours of independent study or thesis. No more than 3 hours of credit in ANTH 501, 590, and 599 (thesis) may be applied toward the Graduate School requirements of 30 hours of graduate course credit and 15 hours of 500-level credit. (4) Each student must demonstrate a reading competence in a relevant language foreign to the student (in the case of conservation archaeology specialists, this requirement is modified; see below).

Students entering the program may petition to have previously taken courses accepted for credit as equivalent to core courses in cases where the equivalence can be documented.

M.A. Degree Committee, Thesis, Research Paper. Each student in the M.A. degree program will consult with the director of graduate studies and relevant faculty members to select a three-person faculty committee, which will assume major responsibility for the student's advisement. At least 2 members of this committee, including the chair, must be from the Department of Anthropology, and the third member may be selected from outside the department. At least the chair should be chosen by the end of the first year, and the entire committee by the end of the third term.

Under the direction of the M.A. degree committee, the student will complete a thesis and register for at least three hours of Anthropology 599 while doing so. A student may submit a published paper, or one accepted for publication in an approved professional journal, instead of a thesis, or may be authorized by the department to substitute a research paper for the thesis. Passing of a comprehensive examination on the student's entire program is a Graduate School require-

ment. One properly bound copy of the thesis, research paper, or article must be deposited with the department before the degree is granted.

CONSERVATION ARCHAEOLOGY

The M.A. degree with a concentration in conservation archaeology is designed to meet the need for anthropologically trained archaeologists in the administration and direction of practical programs in conservation archaeology.

Requirements for this concentration are identical to those for any M.A. degree in anthropology, with the following exceptions. (1) Students need not take the linguistics core course. (2) Statistics may be substituted for the foreign language requirement. However, any student entering the Ph.D. degree program after obtaining an M.A. degree with this concentration must complete the linguistics core requirement and meet the foreign language requirement. (3) In conjunction with the course and distribution requirements for the M.A. degree, conservation archaeology students are responsible for ANTH 406, 430A, 576, and 6 hours of 590.

In addition to regular courses and seminars, the student is expected to engage in field and laboratory work. Archaeologists in the department and the Center for Archaeological Investigations involve conservation archaeology students in their contracts with private corporations and federal, state, and municipal governments.

Additional information on the organization and requirements of the conservation archaeology concentration may be obtained from the coordinator for conservation archaeology, Department of Anthropology.

Doctor of Philosophy Degree Program

Applicants to the Ph.D. degree program must complete the equivalent of the master's degree and apply directly to the Graduate School for admission as a doctoral student. Three letters in support of the application must be forwarded to the director of graduate studies in the Department of Anthropology. Students must also supply a statement of goals for their programs and subsequent professional careers. The department will offer an accelerated entry option to students who have been admitted at M.A. level and who are judged by the faculty of the department to be prepared to begin research at the doctoral level. Such students must complete at least one term in the M.A. degree program before being admitted at Ph.D. level, and must then meet all retention and exit requirements for the regular doctoral option. The student need not submit the application materials required of regular applicants to the Ph.D. degree program as outlined above.

No later than the spring semester of the first year after being admitted to the Ph.D. degree program, students are given a written preliminary examination over their choice of 3 of the 4 major sub-fields of anthropology. Students who fail the examination will be dropped from the program. Students who pass the preliminary examination or who are exempted from it will form a faculty committee in consultation with the director of graduate studies and relevant members of the faculty. The committee must include at least 5 members of the graduate faculty, at least 3 of whom (including the chair) must be from within the department, and at least 1 from outside: the normal case will be 4 from within and 1 additional.

The requirements for the Ph.D. degree include the following. (1) Additional course work in anthropology and other fields within the student's interests. Of the 24 hours of credit required to establish residency, 9 must be in 500-level anthropology courses other than 501, 585, and 597. The Ph.D. committee is expected to help formulate a study program that will usually involve at least one additional academic year of full-time course work beyond the M.A. degree. (2) Research tool requirements. These vary and will be determined between the

student and the committee, subject to approval of the chair of the department. In all cases a certified reading knowledge of at least one foreign language will be required and at least one other tool. Other possible tools could include, for example, computer science, statistics, a second foreign language, or a combination of these or others. (3) Administration by the committee of a three-hour special oral examination covering topical and geographical specialties. The student may not take the examination until 2 years of full-time graduate work have been completed, except by authorization from the Dean of the Graduate School. The student is encouraged to take this examination by the end of three years of full-time Ph.D. level work. In evaluating the examination, the committee may pass the student, fail the student but allow retaking of the examination at a later time (as either an oral or written examination, at the discretion of the committee) or fail the student and recommend dismissal from the program. If a student fails the examination and the committee allows reexamination, it must occur within one year of the first examination and only one retake is allowed. (4) Formal experience in teaching.

Ph.D. Candidacy. After completion of the above requirements, the department will recommend a student to the Graduate School for candidacy. The candidate will design dissertation research in consultation with the committee and will undertake the research necessary to acquire the materials for the dissertation. Candidates must register for 24 hours of credit under ANTH 600.

When a final draft of the dissertation has been accepted by the Ph.D. committee, an oral defense of the dissertation and all supporting work will be held in accordance with Graduate School requirements. After a successful dissertation defense and completion of final revisions of the text, the student must submit two copies of the dissertation to the Graduate School in accordance with its guidelines, and a properly bound copy to the Department of Anthropology.

Art

In all of its graduate studio programs, the School of Art and Design strives to maintain a vital, creative ambience in which emerging artists with strong motivation may develop, through intensive studio practice and appropriate scholarly support, a clear, mature, and professional focus to their creative life. The core of any program is the in-depth studio practice of individual studio disciplines and frequent, sustained contact with working professional faculty and fellow students. This work is supported and extended through formal studio course work, studies in the history of art, and through access to the many resources and opportunities apparent in a large multi-purpose university.

M.F.A. Degree Program Description

The School of Art and Design offers graduate studies leading to the Master of Fine Arts degree with a major in art and offers studies supporting a teaching specialty in art for the Master of Science in Education degree with a major in secondary education. The student is expected to select an area of emphasis (studio or art education), and a program will be planned in consultation with the major professor in that area.

Admission

An undergraduate degree in art or art education, or the equivalent in course work or experience if the undergraduate degree is in another discipline, is required for admission into the Master of Fine Arts degree program. The student must also submit transcripts of all previous undergraduate work, present slides or a portfolio of creative work, and may submit letters of recommendation.

In most cases an undergraduate degree in art education is required for admission into the program constituting a teaching specialty in art for the Master of Science in Education degree majoring in secondary education. Any exception to these requirements must be approved by the faculty in the studio or art education fields and by the director of the School of Art and Design.

M.F.A. Degree

A minimum of 60 semester credit hours is required for the Master of Fine Arts degree with a major in art. All hours that are to count toward graduation must have the approval of the student's major adviser in the studio area of emphasis. Students may emphasize the following areas in studio: drawing, painting, printmaking, sculpture/foundry, ceramics/glass, metalsmithing/blacksmithing, and fibers/weaving. The length of time required to complete a 60-semester-hour program is usually 5–6 semesters or 3 academic years. Most graduate students are in residence for at least 4 semesters. Programs of residency must have the approval of the student's major adviser. Required hours are distributed as follows: 26 hours in the primary studio emphasis, 12 hours in art history or related subjects, 6 hours in thesis or terminal project work, and 16 hours of elective study of which 9 hours must be in studio disciplines. The remaining hours may be elected from any area within the School of Art and Design or in the University at large.

In addition to the completion of course work, all candidates for the M.F.A. degree must, during the last semester of academic work, present a graduate exhibition, present a terminal project or a written thesis, and pass an oral examination. The terminal project is a creative activity presented in lieu of the written thesis, and in practice, the graduate exhibition is considered to satisfy the terminal project requirement.

Graduate education in the studio areas of emphasis is expensive, and because of the individual nature of creative work, it is virtually impossible to predict the exact cost for each student. The School of Art and Design provides the faculty, and the studio and shop facilities that are necessary to the programs offered, but all other costs, especially materials, that are considered necessary to the successful completion of a graduate program are borne by the student.

Art as a Teaching Specialty

The Master of Science in Education degree with a major in secondary education with a teaching emphasis in art requires a minimum of 30 semester hours of graduate credit. Two art education program options are available: (1) the research option for those interested in research, supervision, or eventual doctoral studies, and (2) the teacher-studio option for improving teaching and studio skills.

The research option requires 13 hours in education, 11 hours in art education, 3 hours of thesis (or research paper) with the remaining hours for art electives. The teacher-studio option requires 13 hours in education, 6 hours in art education, 3 hours for thesis (or research paper) with the remaining hours for art electives. All hours that are counted toward graduation and election of either a thesis project or a research paper must have the approval of the art education graduate adviser.

Behavior Analysis and Therapy

(See Rehabilitation Institute for program description.)

Biological Sciences

A student may pursue a program of studies leading to the Master of Science degree majoring in biological sciences.

Requirements for Admission

1. Bachelor's degree with a major in a natural science department.
2. Admission to the Graduate School.
3. Approval of the director, graduate program in biological sciences.

Requirements for the Master of Science Degree Major in Biological Sciences

The student must complete 40 hours of graduate courses in the biological sciences. Special courses required of any student are to be determined by consultation between the student and the program committee, with the following provisions:

1. No more than 24 hours of credit in any one department may be used for the degree.
2. No minor is required.
3. Have at least 15 hours of credit in 500 level courses. These may not include more than 3 hours for special problems, 3 hours for seminars, and 2 hours for readings.
4. Complete at least one 400- or 500-level laboratory course in 3 of the departments of the biological sciences.
5. Submit a research paper.
6. Attend, for credit, at least 1 semester of seminar in 3 of the departments of the biological sciences.

Advisement

Guidance of students shall be by a program committee of 3 members, 1 from each of the biological science programs involved, or other departments at the discretion of the program committee. The program director will serve as an ex-officio member.

Graduate work may be taken in the Departments of Microbiology, Physiology, Plant Biology, and Zoology to obtain a Master of Science degree major in biological sciences in the College of Science.

Additional information may be obtained from: Director of the Graduate Program in Biological Sciences, Life Science II, Room 148, Southern Illinois University at Carbondale, Carbondale, IL 62901.

Business Administration

The graduate faculty, consisting of members of the School of Accountancy and the Departments of Finance, Management, and Marketing, offers graduate work leading to the Master of Business Administration degree, the Master of Accountancy degree, and the Doctor of Business Administration degree.

To support the graduate programs, the College of Business and Administration has a modern computer laboratory equipped with microcomputers and terminals for mainframe access. That laboratory is staffed with graduate assistants and has up-to-date spreadsheet and dBase software. In addition, the Computing Affairs Division on-campus maintains 2 additional laboratories which also contain microcomputers, terminals for mainframe access, and up-to-date-software.

Master of Business Administration

The basic objectives of the Master of Business and Administration (M.B.A.) degree program are first, the development of professional managers and executives to serve the needs of business, government, and other organizations and second, the preparation of students interested in doctoral study. The program is designed to develop the individual's ability to comprehend internal and external social, legal, political, and economic forces as they affect the decision-making process within the organization.

The curriculum enhances the student's professional and academic growth by:

1. Developing critical thinking skills through in-depth analysis of business problems.
2. Strengthening communication skills through class discussions, written assignments, and oral presentations.
3. Increasing organizational and leadership skills through team projects.
4. Broadening comprehension of the dynamics of the business environment through emphasis on the role of environmental variables affecting organizational performance.
5. Emphasizing the global nature of today's business environment and its impact on decision making.
6. Enhancing decision making skills in complex environments through the use of quantitative techniques, computer simulations, database management, and business games.
7. Bridging the gap between the theoretical and practical aspects of business through case analysis and projects with local businesses.
8. Providing professional development and networking opportunities through business-to-student seminars and speaker programs sponsored by the Graduate Business Association.

The program has been structured with flexibility so as to serve both holders of baccalaureate degrees in business administration and those who hold degrees in other disciplines. The M.B.A. program is accredited by the American Assembly of Collegiate Schools of Business (AACSB).

Admission Requirements

Prospective degree candidates are expected to demonstrate a readiness for graduate study and an aptitude for successful performance in graduate level work in business administration. Admission to the program is based on the applicant's undergraduate record, a satisfactory score on the Graduate Management Admission Test, and other evidence pertaining to ability to perform well in graduate work in business administration. Special circumstances and work experience may be considered if presented. More specifically, the applicant must:

1. Meet all admission requirements set forth by the Graduate School. These requirements are outlined elsewhere in the catalog.
2. Complete the Graduate Management Admission Test and have the results of the test mailed directly to graduate programs, College of Business and Administration.

Information regarding this test is available by writing to: Graduate Management Admission Test, Educational Testing Service, PO Box 6103, Princeton, NJ 08541-6103 USA.

To apply, one needs to complete and submit a Graduate School application and an M.B.A. Program application. Application materials may be obtained from: Graduate Programs, College of Business and Administration, Southern Illinois University at Carbondale, Carbondale, IL 62901, (618) 453-3030.

A non-refundable application fee of $15.00 must be submitted with any application to the M.B.A. or D.B.A. program. Attach your check or money order, payable to Southern Illinois University, to the top of the application form. Do not

send cash. Only checks or money orders payable in U.S. funds cleared through a United States bank will be accepted.

Application Deadlines

	Fall	*Spring*	*Summer*
Assistant Applicants	March 15	September 15	February 15
Fellowship Applicants	Nov. 15 of previous year (fall awards only)		
Other U.S. Applicants	June 15	November 15	April 15
Other International Applicants	April 15	September 15	February 15

Degree Requirements

A minimum of 36 semester hours of course work is required. Students must earn a 3.0 grade point average (4.0 = *A)* and a *B* or better in eighty percent of all graduate level course work beyond the foundation. Candidates who receive permission to write a thesis must complete a minimum of 27 semester hours of course work plus an acceptable thesis, for which 6 semester hours of credit are assigned.

Students who enter the M.B.A. degree program without the necessary foundation courses in the common body of knowledge of business and administration as specified by the American Assembly of Collegiate Schools of Business must complete them in a satisfactory manner. These students may be required to complete up to 29 semester hours of acceptable course work to satisfy this requirement. In addition, students must satisfy a computer ability requirement for spreadsheet programs.

For courses previously taken to be evaluated as possible equivalents to M.B.A. foundation courses at SIUC, one needs to have earned a grade of *C* or higher in each and supply the M.B.A. academic adviser with the course syllabus for each course to be evaluated. Where syllabi are not available, a course catalog, or catalogs as appropriate, for the years the courses were completed may be presented. Transcripts may not be substituted for syllabi/catalog descriptions. This supporting documentation needs to be provided to the M.B.A. academic adviser at least two weeks in advance of one's first M.B.A. advisement appointment and subsequent registration.

The M.B.A. degree program course work to be taken beyond the foundation courses is determined on an individual basis in conference with the M.B.A. program academic adviser. All core and elective requirements must be met. For up-to-date information regarding the core and elective courses of the M.B.A. program, contact: Graduate Programs, COBA, Southern Illinois University at Carbondale, Carbondale, IL 62901.

Students may choose to take all of their electives in a particular area such as accounting, finance, management, or marketing in fulfilling their electives, or, alternatively, take electives across two or more areas. Students may request approval to take one or more substantive electives outside of business which would provide training unavailable through business courses and would facilitate the student meeting career goals.

Transfer Credit

Within limits imposed by the policies of the Graduate School, an incoming student may receive transfer credit for up to 6 semester hours of equivalent course work if the courses were taken at an AACSB accredited graduate school.

A graduate student who has 6 hours or less of course work remaining in their program may petition the master's programs committee for permission to complete up to 6 hours of equivalent course work at another AACSB accredited graduate school. The determination of equivalency is to be made by the director of the master of business administration program.

Course work from other than AACSB accredited graduate schools must be approved by the master's programs committee.

Academic Retention

In addition to the retention policies of the Graduate School, a student who has three outstanding recorded grades of *Inc* or *Def* remaining on the grade record at the end of any semester or session, for any reason, will be deemed to be not making normal progress and will be placed on probationary status. If the student has 3 outstanding grades of *Inc* or *Def* remaining on record at the end of the next semester or session, the student will be suspended from the program. The definitions of *Inc* and *Def* may be found in the *Graduate Catalog.*

A student who is to receive a grade of *Inc* in a course is to meet with the instructor to work out a time and conditions for completion of the course within policy guidelines. Typically, a Notification of Incomplete Grade Agreement form is completed and the student is provided with a copy.

M.B.A./J.D. Concurrent Degree Program

The College of Business and Administration (COBA) and the School of Law, together, offer the M.B.A./J.D. concurrent degree program. The J.D. degree alone requires completion of 90 semester hours of course work and the M.B.A. degree alone requires completion of 30 semester hours of course work; however, in the M.B.A./J.D. concurrent degree program the School of Law accepts 9 semester hours of business course work toward meeting the J.D. semester hour requirement and COBA accepts 9 semester hours of law toward meeting the M.B.A. semester hour requirement. The end result is that the concurrent degree program actually entails completion of 81 semester hours of law courses and 21 semester hours of business courses, with an 18 semester hours savings over pursuing both degrees separately outside of the M.B.A./J.D. concurrent degree program.

A student interested in enrolling in the M.B.A./J.D. concurrent degree program must apply to both the graduate program in law (which involves a law school application) and to the graduate program in business (which involves a Graduate School application and an M.B.A. program application) and be accepted by each program. The student may then request permission to pursue the concurrent degree program. This request must be made to both COBA and the School of Law and should be made prior to commencing the second-year law curriculum.

During the first academic year of concurrent work on the two degrees, the student enrolls only in the first-year law curriculum. In any subsequent academic term, the student may enroll for courses either in the School of Law or in the Master of Business Administration program. A student registered for both law and graduate courses in the same term must enroll for a minimum of 10 hours in law, and 12 semester hours in total, in order to meet A.B.A. residence requirements and the academic requirements of the School of Law.

Doctor of Business Administration

The Doctor of Business Administration (D.B.A.) degree program is designed to prepare individuals for faculty research and teaching positions in academic institutions and for high-level administrative or staff positions in business, government, and other organizations. Candidates for the D.B.A. degree must demonstrate in-depth knowledge of business and administration and high potential to undertake significant research.

Admission Requirements

To be eligible for admission, students must have completed a master's degree or its equivalent. A grade point average in all graduate level work of 3.5 ($A = 4.0$) is preferred, but not less than 3.33 is permitted for admission.

In certain instances admission to the D.B.A. program directly from the baccalaureate degree is permitted. To be considered for this admission route, students must have demonstrated promise of success in the D.B.A. program through outstanding achievement at the undergraduate level (minimum grade point average of 3.5 on a 4.0 scale) and superior performance in both the verbal and quantitative components of the Graduate Management Admission Test (minimum GMAT score of 600).

Applicants with exceptional research potential or outstanding academic preparation may have the option to enter the D.B.A. program after at least one semester as an M.B.A. student at SIUC.

To apply to the D.B.A. program, each applicant is required to take the Graduate Management Admission Test (of the Educational Testing Service) and have an official report of these scores sent to SIUC. The applicant needs to complete and submit a Graduate School application and a D.B.A. program application. Application materials may be obtained from: Graduate Programs, COBA, Southern Illinois University at Carbondale, Carbondale, IL 62901.

A non-refundable application fee of $15.00 must be submitted with any application to the D.B.A. program. Attach your check or money order, payable to Southern Illinois University, to the top of the application form. Do not send cash. Only checks or money orders payable to United States banks will be accepted.

Degree Requirements

Students in the program must complete course work in certain foundation areas. A student who has completed successfully the requirements for the M.B.A. degree from an AACSB-accredited graduate business program will have met the foundation requirements. A student with a M.Acc. from an AACSB-accredited program will be expected to take some courses, to be determined by the student's advisory committee, outside the accounting area. All other students will either complete the following courses or demonstrate proficiency based on prior academic work:

BA 410-3 Financial Accounting
BA 526-3 Managerial Economics
BA 451-3 Methods of Quantitative Analysis
EPSY 506-4 Inferential Statistics
and 5 courses from any 3 of the following 4 areas:

a. BA 430, BA 510, BA 530
b. BA 450, BA 550, BA 598
c. BA 440, BA 540, BA 598
d. BA 452, BA 520, BA 560

In addition, the student must demonstrate proficiency in computer programming.

The student must complete a prescribed program of doctoral course work beyond the foundation work. A minimum of 60 semester hours is required: 12-18 hours in the major field; 6-12 hours in a support field; 6-12 hours of research tools; and 24 hours of dissertation credit. Additional hours may be required as prescribed by the student's advisory committee.

It is expected that all doctoral course work will be completed at SIUC. In exceptional cases, the advisory committee may consider petitions to accept credit, not to exceed 6 hours, for doctoral course work done at other institutions.

In addition to the retention policy of the Graduate School, for the D.B.A. program the third grade below *B* or the second grade below *C* in any graduate level

course not designated as a foundation course will result in automatic dismissal from the D.B.A. program without any right of appeal.

Advisement

For each student an advisory committee is constituted and approved according to procedures described in the D.B.A. policies and procedures document of the COBA. The advisory committee is responsible for developing and approving a program of study for the student which meets all requirements of the Graduate School and the D.B.A. program. The specific program is designed in terms of the individual student's career objectives.

Preliminary Examinations

The preliminary examination is designed to determine the breadth and depth of the student's knowledge within the discipline. A minimum of 2 years of study (48 semester hours) beyond the baccalaureate must be completed before the student is permitted to sit for the preliminary examination, and the student must be in the last semester of all scheduled course work.

The preliminary examination has a written and oral portion. After successful completion of the written segment, the student will sit for the oral portion of the preliminary examination. Students who pass the oral portion will be recommended for candidacy when the residency and research tool requirements have been met. Students who fail the preliminary examination, or any part thereof, may petition to retake the examination or any part thereof.

Specific conditions may be stipulated before the student can sit for the examination a second time. Those who fail the preliminary examination a second time will be dismissed from the program.

Dissertation

Upon admission to candidacy, a dissertation committee is constituted and approved according to procedures described in the D.B.A. policies and procedures document of the COBA. The student will prepare a written proposal and submit it to the dissertation committee and make an oral presentation of the dissertation proposal. On acceptance of the written and oral presentation of the dissertation proposal by the dissertation committee, the student will proceed with further work on the dissertation topic. The dissertation committee will monitor the student's progress in completing the dissertation. A final oral examination will be administered by the dissertation committee and will cover the subject of the dissertation and other matters related to the discipline. Upon successful completion of the final oral examination, the candidate will be recommended for the D.B.A. degree.

Other Graduate Degrees Offered by COBA

The college also offers the Master of Accountancy (M.Acc.) degree. In addition, jointly with the School of Law the college offers the J.D./M.Acc. concurrent degree program. The reader is referred to the accountancy section of this catalog for details regarding the M.Acc. and J.D./M.Acc. programs.

For More Information

Additional information regarding the M.B.A. degree program or D.B.A. degree program may be obtained by contacting the Office of Student Affairs, COBA, Southern Illinois University at Carbondale, Carbondale, IL 62901. Additional information regarding the M.Acc. degree program may be obtained by contacting the School of Accountancy in the College of Business and Administration.

Center for the Study of Crime, Delinquency, and Corrections

(See Administration of Justice.)

Chemistry and Biochemistry

Programs leading to the Doctor of Philosophy and Master of Science degrees may be undertaken in the general areas of analytical, inorganic, organic, and physical chemistry, and in biochemistry and molecular biology. The doctoral degree in chemistry is a research degree. To be awarded this degree, the student must demonstrate to the satisfaction of the graduate committee the ability to conduct original and independent research within some area of chemistry and must, in fact, make an original contribution to the science. The master's degree also requires a research project, but with less emphasis on originality and independence.

Admission

Each student must have a baccalaureate degree in one of the sciences, mathematics, or engineering to be considered for admission to an advanced degree program. An undergraduate major in chemistry, with the following courses, is desirable:

(1) One year of organic chemistry (lecture and laboratory).
(2) One year of calculus-based physical chemistry (lecture and laboratory).
(3) One year of analytical chemistry including instrumental analysis.

Prospective students wishing to pursue the degree in the area of biochemistry and molecular biology are expected to have completed courses in organic chemistry, calculus-based physical chemistry, physics, and biology.

Students with deficiencies in any area may be admitted, but such deficiencies may restrict the research areas available to the student and lead to requirements for additional courses during graduate study.

Prospective students are encouraged to contact faculty in areas of the students' research interest.

Applicants are strongly encouraged to submit Graduate Record Examination (GRE) general test scores. Tests from one of the GRE subject test areas (chemistry or biology for students interested in biochemistry and molecular biology) are also encouraged.

Foreign students whose native language is not English will be required to obtain at least 550 on the Test for English as a Foreign Language (TOEFL).

Placement Examinations. One week before the beginning of classes, each admitted student will be given a written examination (ACS standard or equivalent examination) in the division of chemistry in which the student proposes to work. Students who are undecided about a division or who wish to work in a cross-divisional area should take examinations in 2 or more divisions. The results of these examinations are used to place the student in appropriate courses and to advise the student regarding any deficiencies to be corrected.

Formal Course Work Requirement. All graduate students must satisfy core course requirements of the major division. Students in the doctoral program must take for credit at least 6 semester hours of formal 500-level course work outside the major division. At least 3 of these 6 hours must be within the de-

partment. Students in the master's program must take for credit at least 3 semester hours of formal 500-level course work outside the major field. Certain 400-level courses within or without the department may be used to meet this requirement. Students may major in cross-divisional areas. In such cases the formal course work requirement will be modified by agreement of the student's committee and the graduate adviser.

Students in the doctoral program must present 3 departmental seminars for credit (CHEM 595). These include one based on a literature review, the second on the topic of an original research proposal, and the final seminar on the student's own research. Only the last 2 seminars are required of students entering the doctoral program with a recognized master's degree. Students in the master's program must present 1 departmental seminar for credit.

All students must take 1 hour of CHEM 597, Professional Training, each semester in residence.

All course work requirements of the department or the major division are minimum requirements which may be increased by the student's graduate committee.

Research Director and Graduate Committee Selection. Each student should select a research director and graduate committee preferably during the first semester, but no later than the end of the second semester in residence. The student must obtain a selection form provided by the graduate adviser and must interview at least 5 faculty members before selecting a research director and graduate committee. The committee shall consist of the research director (chair), at least 1 member of the major division other than the research director, a member outside the major division, and for a Ph.D. degree candidate a member outside the department. The chair of the Department of Chemistry and Biochemistry, if not otherwise appointed, is an ex-officio member of every graduate committee. A division may increase this requirement.

Graduate Committee Functions. The functions of the graduate committee are listed below.

1. To plan and approve the student's program of study.
2. To review the student's progress in courses and suggest and approve changes in the program of study.
3. To evaluate the student's progress in research and to make appropriate recommendations.
4. To determine whether a student may continue toward a degree. If continuation is denied, the committee must notify in writing the department chair of the reasons for this denial.
5. To read and evaluate the student's thesis or dissertation.
6. To conduct required oral examinations.

As soon as possible after being appointed, the committee will meet to plan the student's program. At this time the progress and program form is completed and filed with the graduate adviser. The committee may require preparation of a master's thesis even if directly pursuing a Ph.D. degree has been previously approved by the faculty.

Research Tools. The department requires no specific research tools. A student's graduate committee, taking into account the student's background and the needs of the research area, may require that the student acquire one or more research tools (e.g., foreign language, computer programming, statistics, and so on). Any research tool requirement must be completed before scheduling the preliminary oral examination for doctoral degree students or the final oral examination for master's degree students.

Assistantship Support. Continuation of assistantship support is contingent upon the student making satisfactory progress toward a degree. In addition, continuation of teaching assistantship support depends upon satisfactory performance of assigned duties. The Graduate School has established time limits for financial support.

First Year Evaluation. The faculty, meeting as a committee of the whole, will review the progress of all graduate students at the end of their first year in residence. For students in the doctoral program the faculty can:

1. recommend continuation in the doctoral program.
2. recommend transfer in the doctoral program.
3. request that the Graduate School terminate the student from the program (giving cause).

For students in the master's program the faculty can:

1. recommend petitioning the Graduate School to allow entry to the doctoral program (accelerated entry option). Such petition can be made any time after one semester in residence.
2. recommend continuation in the master's program with the option to petition the Graduate School to grant a master's degree equivalency. When granted, this allows the student to apply for entrance to the doctoral program without writing and defending a thesis.
3. recommend continuation in the master's program with option to petition to enter the doctoral program after completion of a master's thesis.
4. recommend continuation in a terminal master's program.
5. request that the Graduate School terminate the student from the program (giving cause).

Preliminary Examination for the Ph.D. Degree. Each student in the doctoral program must pass a preliminary examination before being advanced to candidacy. The written portion of the preliminary examination is given cumulatively with 10 examinations scheduled each calendar year. The student must pass 4 examinations in no more than 10 consecutive trials. Students must begin cumulative examinations no later than the semester following completion of the divisional core course requirements. After the student completes the cumulative examinations, the preparation and defense of an original research proposal will serve as the oral portion of the preliminary examination.

Summary of Ph.D. Degree Requirements. Each student must fulfill the requirements of both the Graduate School and the Department of Chemistry and Biochemistry. These requirements are:

1. to fulfill the divisional course requirements.
2. to complete at least 6 hours of formal course work at the 400/500 level outside the major division, at least 3 of which must be within the department.
3. to complete a course of study as determined by the graduate committee.
4. to maintain at least a 3.00 grade point average.
5. to attend weekly seminars and earn 2 credit hours of CHEM 595 beyond the master's degree requirement by presenting departmental seminars.
6. to earn at least 32 credit hours in research and dissertation (CHEM 598 and 600).
7. to satisfy any research tool requirement established by the student's graduate committee.
8. to pass a series of cumulative examinations which shall serve as the written portion of the preliminary examination.
9. to prepare and defend an original research proposal which shall serve as the oral portion of the preliminary examination.

10. to complete a research project and to prepare a dissertation acceptable to the student's graduate committee and the Graduate School.
11. to schedule and pass a final oral examination (defense of dissertation).

Summary of Master's Degree Requirements. Each student must fulfill the requirements of both the Graduate School and the Department of Chemistry and Biochemistry. These requirements are:

1. to fulfill the divisional course requirements.
2. to complete at least 3 hours of formal course work at the 400/500 level outside the major division.
3. to complete at least 21 hours of formal course work at the 400/500 level with grades of *A, B,* or *C.*
4. to earn at least 30 credit hours at the 400/500 level, at least 15 of which are at the 500 level.
5. to maintain at least a 3.00 grade point average.
6. to attend weekly seminars and earn 1 credit hour of CHEM 595 by presenting a departmental seminar.
7. to earn at least 8 credit hours in research and thesis (CHEM 598 and 599).
8. to satisfy any research tool requirement established by the student's graduate committee.
9. to prepare and present a thesis on the research carried out.
10. to schedule and pass a final oral examination.

Cinema and Photography

The Master of Fine Arts degree in cinema and photography is intended to provide substantial advanced training for a small number of highly talented individuals. Emphasis in the program is upon the artistic development of the individual student and the student's creative utilization of cinema or photography.

Students may elect to concentrate in cinema or photography. While concentration is a vital component of the program, our philosophy is that graduate study should increase the options available to the student upon graduation; therefore, cross-disciplinary study is encouraged. Strong supporting course work is available in the areas of theory, history, and scriptwriting; through the School of Art and Design, course work in the other fine arts is also available. A distinguished faculty of 12, excellent facilities, and a large variety of curricular offerings allows the students to individually tailor programs to meet their post-graduation goals.

Acceptance into the program and subsequent continuation in it are at the discretion of the Graduate School and the Department of Cinema and Photography. Minimal admission requirements are those of the Graduate School. Students should contact the director of graduate studies, cinema and photography, regarding admission procedures to the program. Prior to admission to the program, students must satisfy the departmental faculty that they are artistically qualified by presenting evidence of exceptional talent in 1 of the 2 concentrations offered in the degree program. This evidence will ordinarily consist of a portfolio of photographs or 1 or more films. In addition, applicants must arrange for 3 letters of recommendation to be forwarded in support of their application. It is assumed that most of the students applying for admission to the M.F.A. program will be graduates of institutions other than SIUC. All such students would ordinarily provide evidence of having completed training of a thoroughness and quality equivalent to that offered in the undergraduate program of the Department of Cinema and Photography. Students with an M.A. or M.S. degree will also be considered for admission. It is recommended that students wishing to emphasize in still photography have a course work background equivalent to C&P 310, 311, 320, and 322. It is recommended that students wishing to

emphasize in cinema have a course work background equivalent to C&P 355, 356, 360, and 368.

In addition to the above admission requirements, an interview with the department's graduate committee is highly recommended, particularly for students with minimal course work in the field.

A graduate student entering the M.F.A. program is normally expected to spend the equivalent of 2 academic years fulfilling required work. If the student lacks adequate course work preparation, or if the student serves as a graduate assistant, a longer period may be required. Students' creative work and artistic abilities are reviewed at the end of their first year in the program. If the faculty should conclude that a student has not made sufficient progress, such a person would be dropped from the program. In the second year of residence, each student would be engaged in a great deal of independent artistic work culminating in the M.F.A. creative project, involving the completion of one or more photographic exhibits or the completion of one or more motion pictures. The exact nature of the project would be determined in consultation between students and their committees. All creative projects would have to be exhibited publicly before the department would consider this requirement satisfied.

After the first semester the department chair appoints, in consultation with the student, and the director of graduate studies a major adviser and a committee of two additional graduate faculty members. This committee develops a specific plan of study with the student, considering not only the requirements of the Graduate School and of the degree program, but also the goals of the student. The major adviser supervises the creative project. The University reserves the right to retain a portfolio of each student's work. An oral examination by the faculty advisory committee would focus on an evaluation of the project. A formal report describing the project must be filed with the Graduate School.

Degree requirements are 60 semester hours, including 30 hours at the 500 level.

Course Requirements

Photography

12 credits from C&P 401, 402, 404, 405, 418, 420, 421, 422, 423, 424;
6 credits from C&P 471A/B;
9 credits from C&P 597;
6 credits from C&P 541A/B;
6 credits from C&P 575;
4 credits from C&P 595A;
14 credits from general electives;
6 credits from C&P 598.

Cinema

12 credits from C&P 452, 454, 455, 456, 470B;
6 credits from C&P 472A/B;
9 credits from C&P 597;
6 credits from C&P 542A/B;
6 credits from C&P 468 and 574;
4 credits from C&P 595B;
14 credits from general electives;
6 credits from C&P 598.

Completion of an M.F.A. creative project (registration for at least 6 hours in C&P 598 required).

An oral final examination over the M.F.A. creative thesis.

Civil Engineering and Mechanics

Master of Science Degree in Civil Engineering

Graduate work leading to the Master of Science degree in civil engineering is offered by the College of Engineering and Technology. The program is designed to provide advanced study in the areas of environmental engineering, geotechnical engineering, hydraulic engineering and water resources, structural engineering, fluid mechanics, solid mechanics and engineering materials.

Admission

Students seeking admission to the graduate program in civil engineering must meet the admission standards set by the Graduate School and have a bachelor's degree in engineering or its equivalent. A student whose undergraduate training is deficient may be required to take coursework without graduate credit.

Requirements

A graduate student in civil engineering is required to develop a program of study with a graduate advisor and establish a graduate committee of at least three members at the earliest possible date. Each student majoring in civil engineering may, with the approval of the graduate committee, also take courses in other branches of engineering or in areas of science and business, such as physics, geology, chemistry, mathematics, life science, administrative sciences, or computer science.

For a student who wishes to complete the requirements of the master's degree with a thesis, a minimum of thirty semester hours of acceptable graduate credit is required. Of this total, eighteen semester hours must be earned in the civil engineering department. Each candidate is also required to pass a comprehensive examination covering all of the student's graduate work including thesis.

If a student prefers the non-thesis option, a minimum of thirty-six semester hours of acceptable graduate credit is required. The student is expected to take at least twenty-one semester hours within the civil engineering department including no more than three semester hours of the appropriate 592 course to be devoted to the preparation of a research paper. In addition, each candidate is required to pass a written comprehensive examination.

Each student will select a minimum of three engineering graduate faculty members to serve as a graduate committee, subject to the approval of the chair of the civil engineering department. The committee will:

1. approve the student's program of study;
2. approve the student's research paper topic;
3. approve the completed research paper; and
4. administer and approve the written comprehensive examination.

Teaching or research assistantships and fellowships are available for qualified applicants. Additional information about the program, courses, assistantships, and fellowships may be obtained from the College of Engineering and Technology or the Department of Civil Engineering.

Communication Disorders and Sciences

The Department of Communication Disorders and Sciences offers graduate work leading to the Master of Science and Doctor of Philosophy degrees. The program in communication disorders and sciences at the master's level is designed to develop competence in the assessment and treatment of persons with communica-

tion disorders. The Ph.D. degree program has as its objective the training of advanced students to become researchers and educators in specialized areas in speech/language pathology or audiology.

Course work at the master's level should be planned to meet the academic and professional requirements for state and national certification, which are required for professional employment. The M.S. degree program in speech pathology or audiology should culminate in eligibility for one or both of the following certificates: (a) the special certificate in speech and language impaired of the Illinois State Teacher Certification Board; (b) the Certificate of Clinical Competence of the American Speech-Language-Hearing Association. ASLHA certification is required for work in agencies, hospitals, medical centers, and higher education settings. The speech pathology and audiology program is approved and registered with the Education and Training Board of the American Board of Examiners in speech pathology and audiology.

The departmental programs in speech pathology and audiology match the requirements for certification which state that the student must complete a well-integrated program comprised of a minimum of 60 semester hours, including normal aspects of human communication, development thereof, disorders thereof, and clinical techniques for evaluation and management of speech, language, or hearing disorders. Thirty of the 60 semester hours must be in courses that are acceptable toward a graduate degree by the university in which they are taken.

GRE aptitude test scores must be submitted upon application. While they are not mandatory for admission, the scores must be submitted no later than the end of the first semester of residence.

A number of graduate assistantships and fellowships are made available by the College of Communications and Fine Arts and the Graduate School each year. The assistantship awards of the College of Communications and Fine Arts are usually made in the spring for the following academic year by the department. Students may also apply through the department for graduate fellowships and dissertation research grants that are awarded annually by the Graduate School.

Professional experiences for graduate students are provided in a variety of clinical settings: the University's clinical center; area special education facilities; the V.A. Hospital in Marion; nursing homes; Choate Mental Health and Developmental Center; and Good Samaritan Hospital in Mt. Vernon. Cooperative programming is maintained with Marion School for the Deaf, other public and private agencies such as the Division of Vocational Rehabilitation, the Easter Seal Society, and the University of Illinois Division of Services for Crippled Children. Students participate in traveling speech, language, and hearing clinics which serve schools and communities through the media of surveys, diagnostic examinations, and therapy.

Specialized experiences with orthodontists, prosthodontists, plastic surgeons, otologists, and others of the medical and dental professions are also available in the Carbondale, St. Louis, and Chicago areas as well as the medical school at Southern Illinois University. Emphasis is placed on interdisciplinary relationships with other professions throughout the training process.

The department maintains many active research facilities which provide laboratories and specialized equipment for the study of both the normal and impaired functions of the speech, language, and hearing processes. The speech science laboratory is equipped for electromyographic study of the speech musculature, radio telemetry, electrophysiology of hearing, and spectrographic analysis of speech signals. The experimental audiology laboratory, which includes a large anechoic chamber, is equipped for investigations in hearing sensitivity, localization, central tests, speech discrimination, and evoked response audiometry. The laboratory also has equipment needed for studies in automatic audiometry,

middle ear immittance, and acoustic reflex experimentation. This laboratory also has equipment for the measurement of physiological indices of emotion, such as electrophysiologic skin measurements. The department maintains its own mainframe computer terminal and microcomputer laboratory. The availability of sophisticated instrumentation has made programmatic approaches to language research problems possible in the language laboratory. The department also maintains extensive materials for the study of organic problems.

Additional information regarding financial aid, programs, and application procedures can be secured by writing to the chair, Department of Communication Disorders and Sciences, Southern Illinois University at Carbondale, Carbondale, IL 62901. Inquiries from qualified graduates in other fields are welcomed, particularly those interested in interdisciplinary programs.

Master's Degree Program Leading to Certification in Speech Pathology or Audiology

The master's degree requires a minimum of 30 semester hours of acceptable graduate credit (3.0 average), at least 15 semester hours of which are at the 500 level, and the completion of an approved thesis or research project. Specific course requirements and total number of hours are generally determined by advisement after consultation with the graduate student.

Students are encouraged to follow one of the following plans in speech pathology or audiology.

Predoctoral (Thesis) Program: Certification in Speech Pathology.
Professional Courses: 15 hours from CDS 505, 507, 510, 512, 420
Research Tools: 3 hours from CDS 500: and 6 hours from CDS 431 or 503
Research Design or Statistics: 3
Electives: 3 hours selected CDS 408, 431, 503, 517, 521, 525, 526, 528, 530, 533, 536, 540, 541, 544, 548, 550
Thesis: 3
Total: 30

Terminal (Nonthesis) Program: Certification in Speech Pathology.
Professional Courses: 17 hours from CDS 505, 507, 510, 512, 408, 420
Research Tools: 6 hours from CDS 500 and 431 or 503
Electives: 6 hours selected from CDS 408, 431, 503, 517, 521, 526, 528, 530, 533, 536, 540, 541, 544, 548, 550
Research Paper: 1 hour from CDS 593
Total: 30

Predoctoral (Thesis) Program: Certification in Audiology.
Professional Courses: 21 hours from CDS 420, 521, 525, 526, 528, 530, 503.
Research Tools: 6 hours from CDS 500 and a statistics course
Thesis: 3
Total: 30

Terminal (Nonthesis) Program: Certification in Audiology.
Professional Courses: 21 hours from CDS 420, 521, 525, 526, 528, 530, 503
Research Tools: 3 hours from CDS 500
Electives: 3 hours from CDS 507, 517, 540, 541
Research Paper: 3
Total: 30

In addition to the academic programs detailed above, certification in speech pathology or audiology requires a minimum of 300 clock hours of direct supervised clinical contact of which 150 clock hours must be at the graduate level. The state certificate requires that 100 of the 300 clock hours be in a public school set-

ting. The College of Education is entitled to certify students for the public schools; the Department of Communication Disorders and Sciences is entitled to certify students for the American Speech Language Hearing Association. Before graduation, a comprehensive examination as required by the Graduate School for non-thesis programs will be given by the faculty. This examination is generally scheduled after the student has completed at least two semesters of full-time work.

Admission

To be considered for doctoral study, prospective students must submit an application for admission to the Graduate School. In addition, they are required to submit to the Department of Communication Disorders and Sciences a letter of intent and three letters of recommendation. Admission to the Ph.D. program generally requires a master's degree and a GPA for graduate work of 3.25 or above.

The CDS graduate committee reviews all the materials presented and determines not only the acceptability of the doctoral student's credentials, but also the ability of the department or university to provide quality programs that meets the student's needs and expectations. The recommendations of the graduate committee are then forwarded to the chair. The responsibility for reviewing appeals and exemptions will rest with the CDS graduate committee and faculty. Their recommendations are forwarded to the chair of CDS.

Direct Entry into the Ph.D. Program: Exceptional

Students with a baccalaureate degree may apply for entry to the Ph.D. program via the direct post-baccalaureate option. The student must have earned an undergraduate GPA of 3.75 or greater, in an ABESPA accredited program. A student out of a discipline other than communication disorders and sciences must have earned a GPA of 3.75, or greater, from a similarly accredited academic program. A GRE verbal and quantitative composite score of 1200 or above or an equivalent Miller Analogy score is required for consideration for direct post baccalaureate admission to the Ph.D. program.

Accelerated Entry into Ph.D. Program

A student enrolled in the master's program may petition the graduate committee for admission into the Ph.D. program via the accelerated entry option after completing one full semester of graduate study in the master's program.

The student seeking accelerated entry must earn a GPA of 3.75 or greater after 12 hours of master's level CDS course work in the program and must present to the graduate committee substantive evidence of research ability. The graduate committee must agree unanimously that the evidence presented represents extraordinary abilities.

Requirements of Direct or Accelerated Entry

Students admitted by either the early or the accelerated entry option must complete all M.S. program degree requirements save the thesis requirement as well as all regular Ph.D. program requirements. All Ph.D. students admitted via the direct post-baccalaureate or the accelerated entry option must petition the graduate committee for permission to begin working on the Ph.D. requirements once the M.S. requirements have been completed. The petition must contain direct evidence of advanced scholarship and substantive evidence of research productivity.

The graduate committee will recommend acceptable petitions to the faculty for consideration. A majority of the voting members must approve the petition for it to be forwarded to the chair for consideration. Only following the chair's approval may the student begin fulfilling the doctoral requirements.

A student admitted through either the direct post-baccalaureate entry or the accelerated entry option may withdraw from the Ph.D. program by petitioning the graduate committee. In order to obtain the M.S. degree, the student must then complete all outstanding M.S. degree requirements.

Doctor of Philosophy Degree

Program of Study. The student and advisor shall prepare a proposed doctoral program of study during the first term of enrollment in the doctoral program. The proposed program must meet the Graduate School requirements for residency, and shall exclude course work designed to meet the research tool requirement. The program must also include a cognate area which will assure a meaningful competence in subject matter outside the student's major department.

The program must include a description of all course work to be transferred for credit and all course work to be completed at SIUC. The total number of credit hours to be transferred will be subject to Graduate School requirements regarding the transfer of credit and to acceptance by the CDS graduate faculty. Students are required to complete 24 semester hours of credit on campus as a doctoral student within a period not to exceed four calendar years.

The student and advisor shall present to the CDS faculty, no later than two full academic semesters following the start of doctoral study, the student's proposed program of study to the graduate faculty in CDS. No further progress toward the doctoral degree will be accepted until the student's program of study has been approved by a 2/3 majority of the CDS graduate faculty. The student is responsible for distributing copies of the doctoral program to the faculty members at least one week prior to the meeting. Changes in an accepted program of study may be made as the need arises. In such an event, the procedures for constructing the original program are to be followed. A new CDS "Doctoral Program of Study" form must be processed and must be signed by the appropriate officials.

Graduate faculty approval of the proposed program signifies an agreement between the student and the department. Students are encouraged to use the following plan in designing their programs.

Doctoral Program in Communication Disorders and Sciences.
Professional emphasis areas: 15

Area A: Speech Rehabilitation 15 hours from 510, 512, 528, 533, 536, 540, 541, 544, 548

Area B: Language Rehabilitation 15 hours from 505, 507, 517, 533, 536, 540, 541, 544 or;

Area C: Hearing Rehabilitation 15 hours from 521, 525, 526, 528, 530, 533, 536.

Requirements Outside of Emphasis: 9 CDS hours to be selected from areas other than the principal area of emphasis (see areas A, B, C above).
Basic Core Program: 6 hours from CDS 503, 550:
Cognate Area: 6
Research Tool (See description that follows).
Dissertation: 24 hours from CDS 600 and 601
Total: 60

Research Tool. The research tool shall replace neither a required nor a prerequisite element of the student's proposed academic program and must be completed before the student will be permitted to take the preliminary examination for admission to candidacy. The student must demonstrate an ability to deal with descriptive and inferential statistics and research design techniques. Ordinarily this will be accomplished by completing an appropriate sequence in statistics, as

approved by the graduate committee of the Department of Communication Disorders and Sciences. Competency will be demonstrated by achieving a *B* average in the course sequence, or by proficiency. The sequence should be considered to be outside any specific degree requirement.

Retention. Retention is governed by the rules of the Graduate School. Students should avoid accumulating incomplete grades. Students holding graduate assistant appointments are expected to make reasonable progress toward a degree. Except under exceptional circumstances, no student with more than two incomplete grades can be awarded a graduate assistant appointment, and a student holding a graduate assistant appointment is subject to having the appointment terminated upon acquiring two or more incomplete grades.

Preliminary Examination. After satisfactory completion of the course work inside and outside the area of emphasis, the basic core courses research tool, and the cognate requirements, students may request the preliminary examination. The preliminary examination is composed of written and oral portions. The doctoral advisor and the student will discuss the nature of the examination, and the general areas to be covered that are consistent with the student's program of study. The examination is to be comprehensive in nature, not course specific.

The written preliminary exam shall be prepared and administered by five graduate faculty members representing the areas of professional and outside emphasis and the student's research interest. A minimum of three qualified graduate faculty members must be chosen from within the Department of Communication Disorders and Sciences. The faculty submitting questions shall grade their own examinations. One week after the scoring is completed, an oral examination will be given to those *who have passed* the written examination. If the orals are not successfully passed, the student will be required to retake them within a three month period. The orals will be rescheduled by the student's advisor.

Upon completion of the orals, the five members of the preliminary committee will review the entire preliminary examination procedure and will recommend to the department chair whether or not the student should be admitted to candidacy. Should students fail the first examination, they may, with faculty approval, repeat the examination, but it must be accomplished within a 12 month period and may be re-written only once. If the student fails the written preliminary a second time the student will be dismissed from the program.

Dissertation. After successful completion of the preliminary examination, the student will be recommended to the Graduate School for admission to candidacy for the degree. The candidate must then complete a dissertation demonstrating capability in independent research.

The dissertation committee shall consist of five members of the SIUC graduate faculty: the dissertation advisor and at least two CDS members and at least one member from outside CDS.

After the dissertation prospectus has been prepared, it will be submitted to the student's dissertation committee for review, possible revision, and final approval. The student will be responsible for distributing copies of the prospectus to each dissertation committee member at least two weeks before the committee meeting. The purpose of the meeting is to assure the committee that the student is able to conduct the study in a manner that is acceptable at the Ph.D. level.

Prior to the final defense, the student will present the research to the staff and students of CDS in a departmental colloquium. The purpose of the presentations will be to inform CDS students and staff of ongoing research within the department as well as to receive comments and suggestions.

Once the dissertation research is completed to the satisfaction of the dissertation advisor, the time and place of the defense will be scheduled by the advisor. The student will submit a copy to each member of the committee, at least two weeks prior to the oral defense.

The examining committee will consist of the dissertation advisor and the members of the dissertation committee. The dissertation advisor and all but one of its members must be present for the oral examination to convene.

The final examination for program completion shall be oral and cover the subject of the candidate's dissertation and related academic and professional matters.

Community Development

Community development is a program of graduate studies in the applied social sciences leading to the Master of Science degree.

Community development practitioners share a common concern; the alleviation of social problems through community and social change. This concern is expressed through a range of professional activities such as organizing tenant unions, training officers of consumer co-operatives, negotiating foundation grants for community cultural centers, designing community education outreach programs, or researching community issues.

Most community developers are both specialists and generalists; specialists in the sense that they possess technical knowledge and experience in such fields as economics, education, ecology, agriculture, urban affairs, administration, planning, or research; but generalists in their understanding and skill in facilitating processes of social change. Their process skills of working with people have made community developers indispensable to a large number of public and private programs. By developing organizations and institutions through which citizens can participate in policy formation and implementation, community developers are finding an increasing number of opportunities for themselves and the practice of their profession.

The community development program has 5 full-time faculty members with professional expertise in several fields and academic settings. Academic credentials include doctorates in education, anthropology, behavioral sciences, sociology, and political science. Past national and international field experiences of present faculty members include service with the Agency for International Development, the American Friends Service Committee, UNICEF, the World Bank, the Peace Corps, Vista, the National Scholarship Service, and Health Systems Agencies. Faculty are also involved in a variety of on-going community development activities at the local level, which include students as interns and graduate assistants.

Several community service programs are operated out of the community development program. A University Year for Action project provides interns for numerous human service programs in Southern Illinois; Peace Corps training programs help prepare volunteers for work in Africa and the South Pacific. Recent research projects include a folklife inventory documenting the social traditions and heritage of Southern Illinois' diverse populations and a study of rural human services delivery.

Admission Requirements

A baccalaureate degree is necessary for admission. However, application to the program may be made before graduation during a student's senior year.

Admission to the program is not based solely on a student's grade point average. Much weight is given to a student's commitment to action for human betterment, seriousness of purpose, and past experience in working on social and community problems. Current community development students include Peace

Corps returnees, ex-Vista volunteers, community workers, and senior agency officials as well as recent college graduates.

Prerequisites

The prerequisites are 3 upper-division courses in the social sciences with a *B* grade or better, 3 semester hours of social science statistics at the undergraduate or graduate level, and proficiency in written communication. The social science courses should be in at least 2 of the following disciplines: political science, sociology, anthropology, social psychology, economics. The prerequisites may be satisfied after admission into the program.

THE SIUC COMMUNITY DEVELOPMENT CURRICULUM

The community development Master of Science degree program at SIUC offers several career emphases: community planning, community organizing, community relations training, community education, community research, and community program administration.

All students are required to take core courses totaling 30 semester hours plus 14 semester hours in their special emphasis. Students may design their courses of study to focus on particular interests or skills.

Course of Study

The 44 credit hour program consists of a core curriculum, including a supervised field internship, a minor or area of emphasis, and 1 of 4 master's degree options related to the emphasis. Core curriculum courses are on community organization, social change, research methods, and group process. The minor and electives are selected by students from courses related to their career objectives, and may be found within the community development program or other departments in the University. Students with extensive prior community development experience may have their internships waived under certain conditions.

Community Development Core Requirements (30 semester hours)

CD 401-3 Introduction to Community Development
CD 500-3 Research Seminar in Community Development
CD 501-4 Small Group Process in Community Development
CD 502-3 Community and Change
CD 503-3 Problems of and Approaches to Community Development
CD 589-2 Professional Seminar in Community Development
CD 595-7 Internship

Options to complete master's degree (5 semester hours) are either a thesis, research report, extended minor, or master's project. These 5 hours may be earned in one of the following ways:

1. CD 599-5 Thesis Research
2. CD 593-5 Individual Research in Community Development (for research report or master's project)
3. Five semester hours in 400- or 500-level courses in addition to the 9 hours in the regular minor (for extended minor).

Other Course Requirements

(14 semester hours)

a. Minor (9 semester hours): at least 9 hours of 400- and 500-level courses in one or more disciplines, either in community development program areas of emphasis, or other areas selected by the student and approved by the community development faculty. Lists of recommended courses are maintained by the program.

b. Electives (5 semester hours): additional 400- and 500-level courses in the minor, elective community development courses, or other university departments are selected by the student. Community development electives are:

CD 402-3 Comparative Community Development
CD 403-3 Community Organization
CD 404-3 Role Theory and Analysis in Community Development
CD 405-3 Social Planning
CD 491-1 to 6 Independent Study in Community Development
CD 497-1 to 12 A-E, Seminar in Community Development

Field Internship

The field internship is required for the Master of Science degree and consists of approximately 350 clock hours of supervised field work in a community development project. The professional CD 589 Seminar in Community Development must be taken prior to or concurrently with the field internship.

The objective of the field internship program is to provide a practical field experience in which students are exposed to some of the challenges and rewards of community development work. It is designed to test and develop skills, provide opportunity for personal and professional growth, and increase the ability to understand and analyze practical experience. In most cases, the intern is working with a group of persons sharing a common need or problem. The thrust of the project is to encourage self-help approaches to problem-solving and constructive change. The intern is expected to have a significant responsibility for the project's planning, execution, and outcome. The field internship requirement applies to all M.S. degree candidates. The field internship may be waived in exceptional cases where a student has extensive professional experience in community development work.

Options for Completion of the Requirements for the Master's Degree

Four options are available to complete the requirements for the Master of Science degree in community development: a master's thesis, a research project, an extended minor, or a master's project. The master's option selected by the student and approved by the program must be related to the student's area of emphasis or minor. At the completion of 24 hours of course work, the student declares and defines a master's option.

Thesis. The thesis must involve substantial new research in community development. Procedures for the thesis option are the selection of a master's committee, the preparation and approval of a research prospectus, execution of the research, and the submission and approval of the thesis. An oral examination by the student's committee covering the thesis topic and the community development discipline completes the requirements for the degree.

The thesis option is initiated by filing a form in duplicate with the program office specifying the composition of the student's thesis committee and thesis topic. Four copies of the thesis are submitted to the program office upon completion: one for the program, one for the thesis committee chair, and 2 for the dean of the Graduate School.

Master's Project. The master's project is a community development project in which the student takes a major part in its conceptualization, design, and implementation. Procedures for the master's project are the selection of a committee, the submission and approval of a project prospectus, completion of the project, the preparation, submission, and approval of a final report, and the oral examination. Examples of a master's project are the development of consumer cooperative, community health programs, economic development programs, completion

of a community development project, and designing and implementing a training seminar or workshop.

Research Report. The research report demonstrates the student's research and professional capabilities. Procedures for the research report option are the selection of a committee, the preparation and approval of a research prospectus, execution of the research, and submission and approval of the research report. An oral examination of the research topic and on the community development discipline complete the requirements for the Master of Science degree.

The research report option is initiated by filing a form in duplicate with the program office, specifying the composition of the student's research committee and research topic. Three copies of the research report are submitted to the program office on completion: one for the program office, one for the committee chair, and a third for the dean of the Graduate School.

Several features distinguish the master's project from an internship. For the master's project, the student takes on the major initiative for developing the project, and prepares a formal prospectus describing it prior to inception. The project should have a definite structure with a beginning, middle, and end. While the internship stresses learning and growth, the master's project requires the demonstration of independence and professional competence in community development.

The master's project is initiated by filing a form in duplicate with the program office specifying the student's committee and the title of the master's project. Three copies of the final report are submitted to the program office upon completion: one for the program, one for the committee chair, and one for the dean of the Graduate School.

Extended Minor (14 or more credit hours). The extended minor consists of 5 hours of course work outside of community development courses in addition to the 9 hours of courses required for the minor. Since the student has 5 hours which are elective, as many as 19 hours may be accumulated for an extended minor.

In general, the courses selected for the extended minor should have a focus, and the focus and its validity developed under the guidance of the extended minor committee.

Procedures for the extended minor option are the selection of an extended minor committee, the submission of a list of courses for the minor with a justification for their approval, satisfactory completion of course work, and the preparation and approval of a paper. An oral examination of the student covers general knowledge of community development and the extended minor field, and the relationship between the extended minor and community development.

The extended minor option is initiated by filing a form in duplicate with the program office specifying the student's extended minor committee and the minor field. Three copies of a paper must be filed at completion, one for community development, one for the committee chair, and one for the dean of the Graduate School. Students may not take courses for an extended minor until their committees have been formed and the option officially filed.

Oral Examination and Master's Degree Option Committee. Two faculty from community development, and a third member of the graduate faculty from another SIUC program constitute the oral examination and master's degree option committees. The committees are comprised of the same persons, and are selected by the student prior to filing the master's degree option form.

Specialized Areas of Emphasis

The student may select up to 19 hours of course work for a minor or area of emphasis, as part of the 44 units required for the Master of Science degree. The student's area of emphasis should be relevant to the master's option whether thesis, research report, master's project, or extended minor.

Six areas of emphasis (community research, education, training, planning, organizing, or administration) may be selected from courses and colleges throughout SIUC and from the community development program. Course lists for each of these emphasis areas, plus consultation, are available from faculty advisers. Students may also design their own areas of emphasis with the consent of their faculty advisers.

Community Organization. Community organizing is one of the fundamental skills of community development. There is a traditional and continuing concern for widespread participation and citizen representation in development programs. The vocation of community development includes employment as organizers for community action groups, cooperatives, tenant unions, neighborhood associations, consumer lobby groups, and minority rights organizations.

Community Education. The role of community development specialists in community education is essentially that of inter-communicator. These specialists require a fundamental understanding of the art and science of teaching, as well as exposure to a variety of education philosophies and practices. The community education specialist coordinates educational activities for groups and individuals with unmet educational needs.

Several minors are available within the broader area of community education such as: rehabilitation education, consumer education, health education, education in the arts and humanities, sex education, special education, and Afro-American or Black studies education.

Social Planning. The purpose of the planning concentration is to provide the techniques and knowledge to students who wish to work as planners or citizen participation specialists for city and regional planning departments, state agencies, and private international development organizations.

The relation of planning to community development is that of providing specialists who can systematically study problem areas and potential resources, propose programmatic solutions, and appraise the likely consequences of planned and unplanned change. Community planning places emphasis on involving citizens in the planning process in order to more fully reflect the diverse needs and values found in many towns and cities.

Community Relations Training. The community relations training concentration is designed to provide skills and knowledge to students who wish to practice various types of human relations training such as T-groups, leadership training groups, sensitivity groups, organizational development groups, consciousness-raising groups, and the like.

The relation of training to community development is to provide specialists skilled in encouraging cooperative, creative human communication in small group settings, and to provide trainees for the development of community leadership.

From a vocational standpoint, this type of training may be practiced as a human relations trainer (for which certification is provided by National Training Laboratories), a group welfare worker, a counselor, or an organization training officer. Such training is not intended to include the offering of therapy as practiced by clinical counselors, psychologists, or psychiatrists.

Community Development Administration. The administration emphasis is intended for those interested in public administration and management at any level, federal, state, or city, as as well as for those who wish to be involved in the development and management of community owned business enterprises, community development corporations, cooperatives, etc.

Courses are available which provide skills needed for program planning, development, and evaluation within public and private organizations.

Community Development Research. The research emphasis provides students with basic proficiency in applied methods of research in order to describe community populations, assess community needs and problems, and evaluate programs designed to solve community problems. Typical employment opportunities related to this specialization include grant proposal writing, demographic data collection and analysis for planning agencies, and action and evaluation research duties in program development with public and private organizations.

THE COMMUNITY DEVELOPMENT DISCIPLINE

The emergence of community development, as a practice and a discipline, is a post-World War II phenomenon which has its origins in the relief, rehabilitation, and reconstruction efforts of governmental and private agencies in Europe, Africa, and Asia. In this country, early beginnings of the discipline were reflected in agricultural and cooperative extension work, adult education, rural sociology, and social work with a largely rural focus. In the 1970s the U.S. Foreign Service programs (such as USAID and the Peace Corps) had strong community developmental emphasis. National programs like the War on Poverty (OEO) and the Great Society (Housing and Urban Development) began to focus on urban areas, while local, county, state, and national governments developed community development departments as problem-solving, need-assessment, and evaluation units. The recently independent nations of Africa and Asia have used community development as the primary method of nation-building in the post-colonial period, with both urban and rural emphasis. Today community development is a discipline and a practice that applies the theory and methods of social science to the solution of human problems at the community level.

Community Development Services at SIUC

The Community Development Services at SIUC was established in 1953 as a component of area services. SIUC was then becoming a comprehensive university with a broad mission of teaching, research, and service, especially to the surrounding area. The earliest efforts of the Community Development Services staff were devoted to mobilizing the energies and resources of the citizens of the rural Southern Illinois areas.

During the first 10 years, Community Development Services was involved in every sizeable community in Southern Illinois and included comprehensive study and action programs in communities from East St. Louis to Cairo. Service continued to be its major activity until 1974, but as new region-wide planning and service agencies emerged in the early 1960s, the need for trained community development professionals became increasingly apparent. Consequently, a Community Development Institute was authorized in 1962 to offer a Master of Science degree program in community development. The program was fully operational by the fall of 1966, with a contingent of 10 new students.

A research unit was added to the institute and service operation in 1965. The program was redesignated as an academic unit within the College of Human Resources in 1973. Community development is now a program unit in the Division of Social and Community Services of the college.

Approximately 200 students have graduated from the master's degree program in community development, the oldest in the U.S. It is professionally staffed by 6 full-time faculty members and several graduate assistants. The staff maintain close working relationships with a variety of communities and planning, service, and development agencies, in which most students complete their field internships. Areas of emphasis within the program are community development administration, community education, international community organization, social planning, community research, and community relations training and development.

Financial Assistance

A limited number of graduate assistantships is awarded each semester on the basis of performance in the program and need. Fellowships for outstanding graduate students are awarded each year by the SIUC Graduate School. Student work and other financial aid opportunities are coordinated through the Financial Aid office.

Part-time Students

It is possible to enter the community development program while in full-time employment. Core courses are offered in the evening on a regular basis. Students seeking advisement on part-time study should contact the department.

Computer Science

The Department of Computer Science offers a graduate program leading to the Master of Science degree with a major in computer science. Application forms for admission to the Graduate School may be obtained from the department.

Admission and Retention

Decisions concerning the admission of students to, and retention of students in, the graduate program will be made by the department faculty subject to the requirements of the Graduate School.

The evaluation of applicants for admission is based primarily on the student's academic record with particular attention being given to past performance in relevant undergraduate course work. Applicants are expected to have a substantial background in undergraduate computer science courses covering high level and assembly language programming, data structures, computer organization, logic design as well as discrete mathematics, calculus, and linear algebra. In most cases, it would be expected that the applicant has completed course work in the above subject areas prior to admission. In addition, applicants must submit Graduate Record Examination (GRE) general test scores. It is recommended that results from the GRE subject area test (computer science or a related field) also be submitted.

Requirements. A student who has been admitted to the graduate program in computer science can meet the requirements for the Master of Science degree by completing 30 hours of graduate credit subject to the following constraints:

1. Each of the courses CS 401, CS 411, CS 414, CS 451, and CS 455 must be taken. (If a specific course, or its equivalent, is already part of the student's academic background, an alternate course will be substituted.)
2. The 30 hours of graduate work must include at least four 500-level lecture courses.
3. Students are required to write a research paper or thesis carrying three hours of credit under CS 592 or CS 599 respectively.

The decision on whether the research work is to be a research paper or a thesis is made by the student's advisor and committee. After completion of all work, the student will be given a final oral examination over the thesis or research paper and other coursework.

Curriculum and Instruction

The Department of Curriculum and Instruction offers graduate programs leading to the Master of Science in Education, the Specialist, and the Doctor of Philosophy in education degrees. Within the programs, the student may select a specialty area from one of the following: curriculum and instruction, computer-based education, early childhood, educational technology, elementary education, gifted and talented education, instructional development, mathematics education, reading and language studies, school library media, science and environmental education, secondary education, social studies education, and teacher education and supervision.

Admission

The applicant must complete the applications for admission to both the Graduate School and the department. General requirements for admission to graduate programs are described in Chapter 1 of this catalog. A selection and review committee screens the applicant on the basis of prior undergraduate and graduate work, grade point average, standardized test scores, work experience, and letters of recommendation, if needed. The committee may possibly recommend admission for a student with some deficiency if, in its opinion, the student shows unusual professional promise.

Application materials may be obtained by addressing a request to: Coordinator of Graduate Studies, Department of Curriculum and Instruction, Southern Illinois University at Carbondale, Carbondale, IL 62901. Specific information may be obtained by calling (618) 536-2441.

Master's Degree

The Master of Science in Education degree in curriculum and instruction requires the completion of a minimum of 32 semester hours of course work. At least 15 of the 32 semester hours must be at the 500 level and taken at SIUC. The student must also meet curriculum and instruction core course requirements, research requirements, and specialty area requirements. No more than 11 semester hours of credit earned at another college or university may be accepted toward this degree.

Each candidate's program is planned in consultation with a faculty adviser from the specialty area selected by the student, with consideration for the student's interests, experience, and specialty area. Unclassified graduate students should consult with the department chair for information and advice.

A student desiring teacher certification (preschool, elementary, secondary, or K–12) must be admitted to the Teacher Education Program and must follow the teacher certification entitlement process established by SIUC in conjunction with the Illinois State Board of Education.

The school library media specialist area of study offers courses which meet the requirements for the Standard Special Certificate in all areas of media, which is issued by the Illinois State Board of Education. Persons holding a valid teaching certificate may qualify as a school media professional by completing the following courses: C&I 438, 439, 440, 442, and 435 or 445. Other courses in the utilization and administration of teaching materials mare designed to prepare both audiovisual coordinators and librarians to become fully qualified media specialists who can administer all teaching materials.

Program Requirements. The Master of Science in Education degree in curriculum and instruction requires a 9 semester hour professional core, specialty area courses, and research. This professional core is as follows: C&I 503, Introduction to Curriculum; C&I 504, Systematic Approaches to Instruction; and C&I 500, Research Methods in Education. The specialty area courses consist of either 23 semester hours plus a research paper or project, or 17–20 semester hours plus a thesis (3 to 6 semester hours). The minimum number of required semester hours is 32.

Each student demonstrates research skill by preparing a research paper, a project, or a thesis. If the student chooses to satisfy the research requirement with a thesis or research paper, then the adviser becomes a part of a committee of no fewer than 3 persons selected by the student and the adviser. The adviser (chair) and at least one other person must be members of the faculty of the student's specialty area. The purpose of this committee is to assist with and approve the research requirement and to prepare and conduct the final comprehensive examination.

The student choosing to satisfy the research requirement by preparing a research paper completes the research paper under the supervision of the adviser, or the adviser may constitute a 3 person committee which supervises the completion of the paper. The adviser will attest to the successful completion of the paper and report to the coordinator of graduate studies that graduation requirements have been satisfactorily completed.

Each student in the M.S. Ed. degree program must complete a final comprehensive examination. This examination may be either written or oral, or both. The specialty area faculty will form a committee of no fewer than 3 persons to prepare and evaluate the final comprehensive examination. The student may take the final comprehensive examination no more than 3 times.

If the student chooses to satisfy the research requirement by preparing a research paper, a coordinating committee of 3 persons representing the student's specialty area will prepare and evaluate the written comprehensive examination. A student selecting the research paper option must notify the coordinator of graduate studies and the specialty area coordinator at least 2 weeks prior to the date scheduled by the department for the written comprehensive examination. The written examination will be administered on the first Saturday in October, the first Saturday in March, and on Thursday of the third week of the summer session.

If the student chooses to satisfy the research requirement by preparing a thesis or project the student will take a final oral comprehensive exam. The final oral comprehensive examination is a defense of the thesis or project and must be scheduled with the chair of the student's committee at least 2 weeks prior to the date desired for that examination.

Specialist Degree in Curriculum and Instruction

The Department of Curriculum and Instruction offers the Specialist degree in curriculum and instruction. This degree program is designed for teachers and other personnel who seek to improve their performance in specialized areas. The Specialist degree program is intended for those preparing for positions which call for a higher level of study than the master's degree but without the emphasis on depth of research required for the doctorate. A major goal of this program is to strengthen an individual's area of specialization by providing the student with a program of greater depth and breadth than is possible at the master's degree level. The Specialist degree program is designed to meet the student's professional goals.

Admission. Applicants for admission to the Specialist degree program must meet minimum Graduate School standards for admission to and retention in the Specialist degree program. No more than 6 semester hours earned at another college or university may be accepted toward requirements for the Specialist degree. At the time of acceptance into the program, an advisory committee of 3 professors will be appointed to design the program cooperatively with the student, supervise the field study, and administer a comprehensive oral examination. At least 1 member of this committee, the student's adviser, will be from the student's area of specialty.

Program of Studies. A minimum of 30 semester hours' credit beyond a master's degree, including field work, is required for completion of the program. At least 15 semester hours must be at the 500 level. The Specialist degree in curriculum and instruction has a 12 semester hour core requirement; 14 to 17 semester hours of specialization; and 2 to 6 semester hours of independent investigation/research, for a total of 30 semester hours. The speciality area semester hours are determined by the student and the advisory committee. The professional core of courses is as follows: C&I 583, Instructional Theory, Principles, and Practices; C&I 584, Curriculum Theory, Foundations, and Principles; C&I 554, Integration of Educational Media; and C&I 585B, Supervision for Instructional Improvement.

Ph.D. Degree in Curriculum and Instruction

The Ph.D. degree in education with a concentration in curriculum and instruction is designed for teachers and other educational personnel who seek to improve their performance in general and specialized areas in either the public schools or the private sector. This program is designed for students who desire positions requiring advanced preparation at the highest level with emphasis on theories of curriculum and instruction and in-depth preparation in research. For example, this program is oriented toward students who aspire to positions with institutions of higher education, state departments of education in the United States, ministries of education in foreign countries, educational sections of human service agencies, business and industry, and public schools.

Admission. In addition to the application for admission to the Graduate School, the applicant must also complete the departmental application for admission to the concentration and the related specialty area. A selection and review committee screens the applicant on the basis of prior graduate work, grade point average, standardized test scores (Miller Analogies Test or Graduate Record Examination), work experience, and letters of recommendation. The TOEFL score is required for foreign students. The selection committee recommends admission of the student only if the specialty area has an appropriate sponsor for the applicant and if a faculty member who is qualified to direct dissertations agrees to serve as chair of the student's doctoral committee.

The admissions committee may possibly recommend a student for admission who shows some deviation from departmental standards if, in the committee's opinion, the student shows unusual professional promise.

Retention. Any prospective doctoral candidate with a grade point average of less than 3.25 and 20 semester hours of doctoral work will not be allowed to continue in the program and will not be readmitted at a later date. Students must accumulate an overall grade point average of 3.50 for all doctoral work to qualify to take the preliminary examination.

Prior to the completion of 30 semester hours of course work, students meet with their major professors to determine whether or not to continue as doctoral students. Such matters as grade point average, progress in the program, course

completion, motivation, and general academic scholarship skills in writing and research is considered. A report is then made to the doctoral committee and the departmental chair.

Program Requirements. The concentration in curriculum and instruction has both College of Education and C&I requirements. A minimum of 64 semester hours beyond the master's degree is required. The College of Education professional core of 8 semester hours consists of EDUC 590, Doctoral Seminar in Cultural Foundations of Education and EDUC 591, Doctoral Seminar in Behavioral Foundations of Education.

The C&I requirements include a core of 9 semester hours; at least 23 semester hours in the selected specialty area; research tools usually totaling 8 semester hours or the equivalent (hours for research tools are not counted in the total of 64 semester hours); and a minimum of 24 semester hours of dissertation. An internship of 2 to 8 semester hours is highly recommended. Courses comprising specialty area hours other than the core courses are determined by the student and the doctoral committee. The professional core of courses in the curriculum and instruction concentration is as follows: C&I 583, Instructional Theory, Principles, and Practices; C&I 584, Curriculum Theory, Foundations, and Principles; and C&I 582, Advanced Research Methods in Education.

Research Requirements. Research tools are selected on the basis of their appropriateness for the area of concentration, specialization, and type of dissertation research. At least one research tool, as outlined by the College of Education is selected by the doctoral committee in cooperation with the graduate student. The 8 options available are: quantitative methods, historical methods, foreign language methods, philosophical methods, qualitative methods, symbolic methods, and evaluative methods.

Preliminary Examination. The preparation and direction of the preliminary examination are the responsibility of the specialty faculty and the student's doctoral committee. Concepts related to curriculum, instruction, and research/evaluation will be integrated into the preliminary examination. Additional oral and written examinations may be required by the student's doctoral committee.

The examination will be offered 3 times a year: Wednesday, Thursday, and Friday of the fifth week of each term. A student may take the examination no more than 3 times.

Prospectus, Dissertation, and Final Oral Examination. Students may not register for dissertation hours until they have passed the preliminary examination. Having been admitted to candidacy, students submit prospectuses to their doctoral committees for approval. The dissertation must show high attainment in an independent original, scholarly, and creative effort. A student's dissertation will be circulated to members of the doctoral committee at least 3 weeks in advance of proposed defense.

The Department of Curriculum and Instruction requires an oral examination conducted by the doctoral committee. Oral examinations are open to all interested observers. Notice of the time and place of the examination and the abstract of the dissertation are circulated throughout the department and the University.

Economics

The Department of Economics offers graduate programs that lead to both master's and doctoral degrees. The master's degree is designed to be a twelve- to six-

teen-month program in which the student takes courses in theory as well as an applied specialization. The doctoral program is built around a core of courses in microeconomics and macroeconomics and allows the student to specialize in two fields. The coursework towards the doctoral degree is expected to take three years and the writing of a dissertation one year.

Admission

The overall scholastic record and potential of the applicant for admission is more important than prior preparation in specific areas of economics. While undergraduate specialization in economics is desirable, the program is open to students whose undergraduate specialization has been in other fields. However, if the student has not had intermediate level microeconomics, macroeconomics, and statistics, remedial work may be required before admission to the department.

Application forms must be submitted to the Department of Economics. Application materials, as well as additional information, may be obtained from: Director of Graduate Studies, Department of Economics, Southern Illinois University at Carbondale, Carbondale, IL 62901, (618) 536-7746.

All applicants should take the aptitude portion of the Graduate Record Examination. Information on testing dates and places may be obtained by writing to Educational Testing Service, Princeton, New Jersey 08540. Scores should be sent to Southern Illinois University at Carbondale marked "Attention: Department of Economics." All exam scores must be received before admission.

Evaluations of applicants by the department are based on information from the application form, GRE scores, transcripts, and other information.

Applicants not admitted to the economics department who meet the Graduate School requirements may register for remedial courses as unclassified students. Such persons may be considered for admission to the Department of Economics at a later date, based on their performance in such remedial courses. This option is not available for international students.

Foreign applicants whose native language is not English must take the Test of English as a Foreign Language (TOEFL). The Department of Economics requires that the applicants score 550 or above for admission to the graduate program. The TOEFL must be taken no more than 24 months prior to the date when admission is sought. For information concerning TOEFL testing dates and locations, write to Educational Testing Service, Princeton, New Jersey 08540.

Entry into Ph.D. Program. A student with a master's degree must meet Graduate School admission requirements with a graduate grade point average of 3.25 ($A = 4.0$) or better. A student with a bachelor's degree must meet Graduate School admission requirements with an undergraduate grade point average of 2.7 or better. After meeting these requirements the bachelor's degree student will be initially admitted as a master's student. Upon passing the qualifying exam, taken after the first year of graduate study, the student will be given entry into the doctoral program. Application for entry should be made to the director of graduate studies in the Department of Economics.

Entry into the Master of Science Program. The Master of Science program is intended to serve as a terminal degree. A student with a bachelor's degree must meet Graduate School admissions requirements with a grade point average of 2.7. Application materials are available from the director of graduate studies in the Department of Economics.

Requirements for the Master of Science Degree

The master's degree prepares students for positions in government and business and for teaching at the junior college level. The general requirements for the

Master of Science degree may be conveniently classed under two broad headings, course and hour requirements and thesis requirements.

*Course and Hour Requirements. Th*ose students who plan to receive the master's degree as a terminal degree are required to have the following courses:
ECON 465 Mathematical Economics I
ECON 463 Applied Econometrics
ECON 540a Microeconomic Theory I
ECON 541a Macroeconomic Theory I

Each master's student must take at least one graduate director-approved, two-course specialization. In addition, each master's student must accumulate a minimum total of 30 graduate-level credit hours approved by the director of graduate studies. Of this minimum, 21 hours must be in Economics courses, excluding Economics 408, 440, 441, 443, 507, and 590, and 15 must be in 500-level courses.

Any student who earns 6 semester hours of *C* or below in Economics courses taken for graduate credit is subject to dismissal from the graduate program in economics. A 3.0 GPA in 400- and 500-level economics courses excluding Economics 408, 425, 436, 440, 441, 471, 501, 502, 510, 525, and 598 and in all other graduate courses must be maintained. Only 400- and 500-level courses may count toward the master's degree. Graduate students in economics cannot take Economics 408, 440, 441, or 443 for credit toward a degree in economics.

Thesis Requirements. The master's candidate in economics can fulfill the thesis requirement in one of two ways:

First, he/she may write a master's thesis. The thesis shall be supervised by a committee of at least three members of the graduate faculty and may be counted for 6 semester hours of credit as Economics 599. (Thus the thesis constitutes 6 of the required 30 credit hours.) Two copies of the approved thesis must be presented to the Graduate School at least three weeks prior to the date of graduation, to be bound and shelved in the library. One copy of the thesis is to be submitted to the Department of Economics.

Second, the student may enroll for 3 hours in Economics 598. The research paper required in Economics 598 will be accepted in lieu of a master's thesis when approved by the director of graduate studies for that purpose. Thus the research paper constitutes 3 of the required 30 credit hours. One copy is to be submitted to the Graduate School at least three weeks prior to the date of graduation, and one copy is to be submitted to the Department of Economics. Under this option, the student must take an additional graduate-level course for 3 credit hours.

Doctor of Philosophy Degree

The Ph.D. degree prepares students for teaching and research positions in the academic world, for positions such as senior economist in private industry and consulting firms, and for government positions requiring advanced economic training.

Course Requirements and Qualifying Exam. In the student's first year of graduate work he/she will be required to take the following courses:
ECON 541a Macroeconomic Theory I
ECON 541b Macroeconomic Theory II
ECON 540a Microeconomic Theory I
ECON 540b Microeconomic Theory II
ECON 465 Mathematical Economics I
ECON 567a Econometrics I

At the end of the first year (June) the student will take a qualifying examination in microeconomic and macroeconomic theory. The student will be allowed two attempts at passing the qualifying exam.

Fields of Specialization. The student is required to pass examinations in two specialized areas in economics after completion of the appropriate coursework for credit and with the prior consent of the director of graduate studies. The Department of Economics offers the following fields of specialization: economic development, international economics, monetary theory and policy, measurement in economics, advanced economic theory, and finance. The first field exam will normally be taken at the end of the second year and the second field exam at the end of the third year.

Other Required Courses. Students are required to pass either Economics 450 (History of Economic Thought) or 420 (History of American Growth in the Twentieth Century). In addition, students are required to pass the following courses:
ECON 511 Mathematical Economics II
ECON 540c Microeconomic Theory III
ECON 541c Macroeconomic Theory III
ECON 567b Econometrics II
ECON 567c Econometrics III

Dissertation

Upon completion of the coursework and passing of the exams discussed above, the student will then be admitted to candidacy for the Ph.D. This will normally occur after the third year of work. Following this, the candidate, in consultation with his/her dissertation chairperson, will form a dissertation committee and develop a proposal. After the proposal is approved, the student must complete a dissertation based on original research and successfully defend the dissertation before the faculty.

The Doctoral Program in Education

One may pursue a program of study leading to the Doctor of Philosophy degree in education through any of 8 approved concentrations: curriculum and instruction, educational administration, educational psychology, health education, higher education, physical education, special education, and vocational education studies.

Students must satisfy the requirements of the Graduate School in addition to the College of Education requirements for the Doctor of Philosophy degree in education. General policies pertaining to the Doctor of Philosophy degree in education are enumerated in this section; policies specific to each concentration may be obtained from the appropriate departmental chair.

For program descriptions of Master of Science in Education and Specialist degrees, the student should review the material listed in this publication in the appropriate departmental section or consult the appropriate department.

Application

Applicants must submit the standard application materials to the Graduate School. Additional data may be requested by the faculty of the specific concentration. The student is encouraged to contact the appropriate departmental executive officer for specific guidelines.

Admission and Retention

The application materials of those who meet Graduate School requirements for admission to the Ph.D. program are forwarded to the College of Education. The department concerned reviews all documents relative to the student and makes a recommendation to the academic affairs committee of the College of Education; this committee makes the final admission recommendation through the dean of the College of Education to the Graduate School. Retention standards beyond minimum Graduate School standards are established by each concentration and are available from the departmental executive officer of the appropriate department.

Advisement

For each student a doctoral committee consisting of a minimum of 5 members is constituted and approved according to procedures described in the *Ph.D. Policies and Procedures Manual of the College of Education.* Copies of the manual can be obtained from the dean of the College of Education. The doctoral committee also serves as the student's dissertation committee.

The program, planned to include all graduate study beyond the master's degree, should be approved at a meeting of the student's committee. The program is then forwarded to the dean of the College of Education for final approval and filing.

Program Requirements

Each doctoral student in education must successfully complete a prescribed core of 8 semester hours in social and philosophical foundations of education (EDUC 590) and in psychological foundations of education (EDUC 591). For each concentration there are also basic courses which should be completed prior to the student taking the preliminary examination. Information about these specific courses can be obtained from the appropriate departmental executive officer.

Research Competencies. The Ph.D. degree in education is a research-oriented degree. As such, it consists of a program of studies and other appropriate experiences designed to facilitate the acquisition of knowledge, attitudes, and skills necessary to conduct systematic intellectual inquiry. This overall aim is accomplished via two major program components: (a) general research competencies, including an understanding of the fundamental nature of approaches to problem solution and an appreciation for the role of research in professional education, are developed through completion of a minimum of 32 semester hours of course work in any of 8 approved concentrations, and (b) specific technical and methodological competencies are developed through completion of individually prescribed research tools. Such tools are selected on the basis of their appropriateness for the area of concentration in which the student is working and their relevance to the student's research interests. Research tools are applied in the process of completing requirements for the doctoral dissertation. A list of approved research tools for the Ph.D. degree in education is available in the *Ph.D. Policies and Procedures Manual of the College of Education.*

Preliminary Examination. All students in the Ph.D. program in education must take the preliminary examination over areas determined by the student's doctoral committee. In addition, the examination may cover areas specific to a concentration. The examination is offered 3 times a year: Wednesday, Thursday, and Friday of the fifth week of each term.

A student may petition the doctoral committee for permission to take the preliminary examination after successful completion of the research requirement, successful completion of all or most of the course work, and successful comple-

tion of the doctoral seminar sequence in education. A student who fails the examination on the initial attempt may take the examination 2 additional times. If at that time the student has not passed the examination, the student is dropped from the program.

Admission to Candidacy. A student may be advanced to candidacy after the student has completed the 2 doctoral seminars, EDUC 590 and 591, fulfilled the residency requirements for the doctoral degree (see degree requirement in Chapter 1), met the research tool requirement, and passed the preliminary examination. The doctoral committee chair should initiate the admission to candidacy forms and forward the forms to the dean of the College of Education. Admission to candidacy is granted by the dean of the Graduate School upon the recommendation of the dean of the College of Education. The doctoral degree may not be conferred less than six months after admission to candidacy, except upon approval of the dean of the Graduate School.

Dissertation. The doctoral committee consists of a chair who is authorized to direct doctoral dissertations and at least 4 others who are authorized to serve on doctoral committees. The committee is appointed by the dean of the Graduate School upon the recommendation of the dean of the College of Education. At least one member of the committee must be from a department other than that of the student and at least one member from a unit outside the College of Education.

In choosing a topic for the dissertation, the candidate should prepare a prospectus for the dissertation and submit the prospectus to the doctoral committee for approval. After the doctoral committee approves the prospectus, the chair of the committee files one copy of the approved prospectus in the office of the dean of the College of Education.

Satisfactory completion of the dissertation requirement includes the passing of an oral examination covering the dissertation and related areas.

Educational Administration and Higher Education

The Department of Educational Administration and Higher Education offers an approved major in educational administration leading to the Master of Science in Education degree. It also administers the major in educational administration leading to the Specialist degree and provides courses and instructional personnel for doctoral students who wish to concentrate in educational administration at the doctoral level. All degrees are NCATE approved. Interested applicants should direct inquiries to the admissions clerk of the department.

Faculty from the Department of Educational Administration and Higher Education, in cooperation with faculty from other departments, offer courses in adult and community education. Inquiries about these courses should be directed to the chair of the department.

Master of Science in Education Degree

At the master's level, concentrations are offered in educational administration, instructional supervision, and adult education.

Educational Administration Concentration. Within the educational administration concentration, course work may be selected to meet Illinois State Board of Education certificated positions such as elementary principal, secondary principal, curriculum coordinator, school business manager, vocational-technical director, special education director, and for a variety of noncertificated positions in other educational institutions and settings. A minimum of 32 semester hours is

required. Degree requirements and administrative certification requirements are not necessarily the same although programs may be planned to meet both degree and certification requirements. Students must make application for the administrative certification program through the dean's office, College of Education.

Admission criteria include undergraduate grade point average, work experience, and letters of reference from persons knowledgeable of the candidate's ability to do graduate work.

The Master of Science in Education degree with a concentration in educational administration includes a basic core: administration, EAHE 501 and 503; research and tool subjects, EAHE 500, and EAHE 593; a foundations course (e.g., EAHE 430, 432, or 454); and a course in curriculum (e.g., EAHE 511, C&I 531, or C&I 571). Elective courses are determined by the student and the adviser. A research report and comprehensive oral examination are also required. It is recommended that applicants seeking administrative certification in the public schools have at least 2 years of successful teaching experience prior to or concurrent with the course work.

Instructional Supervision Concentration. Regulations for the concentration in instructional supervision parallel those for the concentration in educational administration. Students in this area normally elect specific courses in supervision and curriculum appropriate to their goals as supervisors, (e.g., elementary, secondary, or both). The department encourages a cross-departmental approach in the selection of appropriate courses for individual programs.

Adult Education Concentration. The master's degree in adult education is housed in the Department of Educational Administration and Higher Education. The purposes of the program are to provide those persons who already work in the field the opportunity to upgrade their current knowledge about adult education and to train persons new to the field for positions in higher education or other agencies that offer programming in the adult and continuing education field.

To meet these objectives, the program has two options: a specialization in higher education; and an option to prepare persons for agency employment.

The core categories of the program include: general adult education (EAHE 455, Introduction to Adult and Continuing Education); administration (courses vary by option), social and psychological foundations of adult education (EAHE 514, Foundations of Adult Education and EAHE 537, The Adult Learner); research and thesis (EAHE 500, Educational Research Methods and EAHE 593, Individual Research); internship (EAHE 595); and electives. Both options require 32 semester hours of credit.

Specialist Degree

The Specialist degree major, educational administration, is structured on a 30 semester hour sequence which requires: 6 semester hours in advanced administration seminars, EAHE 551 and 553; 4 semester hours in an administrative internship, EAHE 595; and 3 semester hours in independent investigation, EAHE 596; and additional elective courses, totaling a minimum of 17 semester hours. These elective courses are determined by the student and an advisory committee. A comprehensive oral examination and a field-based research study is also required. Options in educational administration and adult education are offered.

Although course work may be planned to meet both degree and Illinois State Board of Education certification requirements, degree requirements and administrative certification are not necessarily the same. For example, candidates seeking the Illinois Superintendency endorsement (level III) are required to have level I or level II administrative endorsement, and additional require-

ments, such as a minimum of 9 semester hours in foundations of education course work in their total graduate program, a field study, and 6 semester hours in interdisciplinary seminars, EAHE 559 and 561 or in cognate course work taken out of the college.

Admissions criteria include: (1) objective measures rated on a point scale developed by the department, i.e., undergraduate and graduate grade point averages and the results from the Miller Analogies Test or the Graduate Record Examination and (2) subjective measures including letters of reference from persons knowledgeable of the candidate's ability to do advanced graduate work, and the appropriate work experience.

This program is based on the supposition that the applicant has a master's degree in educational administration or its equivalent. Students entering the program without this previous administrative training will be required to complete prerequisite work as determined by the student's committee.

Educational Administration Option. For the educational administration option, the specific course requirements are as follows: advanced administrative seminars, EAHE 551 and 553, Politics of Education and Systems and Accountability; EAHE 527, School Business Administration; EAHE 531, School Board and Policies; EAHE 595, Internships in Educational Administration; EAHE 596, Independent Investigation; and at least 11 hours of electives approved by the student's adviser.

Adult Education Option. For the adult education option, the specific course requirements are as follows: EAHE 475, Administration of Staff Development; EAHE 510, Foundations of Adult Education; EAHE 527, School Business Administration; advanced seminars, EAHE 551 and 553; EAHE 565, Continuing Education and Extension; EAHE 595, Internship in Educational Administration; EAHE 596, Independent Investigation; and 6 semester hours of electives approved by the student's adviser.

Doctor of Philosophy Degree in Education

The Department of Educational Administration and Higher Education participates in the doctoral program in education with an approved concentration in educational administration. See the description of the Ph.D. degree in education.

Inquiries regarding application to their programs should be directed to the admissions clerk of the Department of Educational Administration and Higher Education.

Educational Psychology

The Department of Educational Psychology offers graduate studies that lead to the Master of Science, the Specialist, and the Ph.D. in Education degrees. In addition, completion of course work and supervised experiences that meet standards for state entitlement and certification of school psychologists and counselors are a part of the degree programs. The purposes of these graduate programs are to prepare professional educational psychologists to engage in the practice of their specialization and to pursue research in their areas of interest. Programs are monitored to be in line with standards set forth by the American Association of Counseling and Development, National Association of School Psychologists, the American Psychological Association, the North Central Association, and the National Council for Accreditation of Teacher Education. The counselor education program is accredited by the Council for the Accreditation of Counseling and Related Educational Programs (CACREP).

Professional experiences and interests of students along with the teaching and research capabilities of the faculty serve as a basis for individualized courses of study. Sufficient latitude in program planning is provided so that students in concert with their adviser and their committee plan programs to capitalize on student interests and faculty capabilities. Human learning and cognition, affective behavior, development, instructional psychology, child and adult counseling, marriage and family counseling, career development, measurement and statistics, psychological assessment, and research design represent professional and research specialties of the faculty.

Master of Science in Education

Academic experiences leading to the Master of Science degree are provided through concentrations in educational psychology and counselor education. Graduates from these programs are prepared to pursue advanced graduate studies and assume roles as professional counselors or educational psychologists in schools, colleges, and other agencies that serve the developmental needs of people.

Program requirements: core requirements consist of competencies in learning, quantitative methods, and development. Specific course selections to meet the core, transfer of credit, and the composition of the rest of the degree program are determined by the students and their advisers with the approval of the department chair.

Completion of a thesis, research paper, or project (1–6 hours) is required to meet the requirements of a master's degree in education. A thesis requires a research format that follows a formal method of inquiry to provide answers to questions of a basic nature to the field. Research papers or projects focus on specific information-gathering procedures or a product that meets a need for specific purposes.

An oral or written comprehensive examination covering course work, thesis, research paper, or project is required before students can be recommended for graduation. The faculty of each concentration determines the specific nature of the examination.

Admission and Retention. Students seeking admission to master's degree studies in the department must apply to and meet requirements for admission to the Graduate School and be approved by the Department of Educational Psychology. Scores from the Graduate Record Examination (GRE), an undergraduate grade point average of 2.7 ($A = 4.0$) for unconditional admission (students with an undergraduate grade point average of 2.4 may be considered for conditional admission); letters of recommendation, and evidence of successful experience or commitment to the profession are required. Each student application is considered on an individual basis. Professional qualifications, graduate courses taken, and student goals are also considered.

The adviser, along with the faculty of the concentration, is responsible for reviewing student progress each semester. Students are required to maintain a 3.0 grade point average and to be progressing toward their professional goals within the guidelines formulated in the advisement process. Failure to make progress or violations of department, college, or Graduate School regulations may result in dismissal from the program.

Specific information about programs and how to apply may be obtained by calling (618) 536-7763 or writing to the chair, Department of Educational Psychology, Southern Illinois University at Carbondale, Carbondale, IL 62901.

EDUCATIONAL PSYCHOLOGY

The master's degree concentration in educational psychology is a minimum 32-hour program. Students who wish to acquire fundamental knowledge and inquiry skills in human learning and research design are required to write a thesis (6 hours). Students who are more interested in applied positions or obtaining the foundation experiences upon which course work for counselors and school psychologists are based may elect the research paper or project option.

Graduates from this program have taken positions as teachers, researchers, and instructional designers and evaluators in the military, schools, industry, the military, colleges, and other institutions. Others have continued to pursue their education at the Ph.D. level or integrate their experiences into the entitlement programs for certification in counseling or school psychology.

COUNSELOR EDUCATION

Students who complete this program also fulfill the requirements of the entitlement program for certification in Illinois. This is a minimum 48-hour CACREP approved program that prepares students to work with children and adults in elementary and secondary schools, higher education, mental health settings, and other agencies or settings. Emphasis is placed on child, adolescent, adult, and marriage counseling. Programs that focus primarily on handicapped or abnormal populations are centered in other departments in the University.

Students who first pursue the program in educational psychology as a preparation for counseling certification should indicate this intent at the beginning of their program. In this manner, experiences can be planned to better meet the needs of the student.

SPECIALIST DEGREE

The Specialist degree is awarded to students who complete successfully a year of sequenced experiences (minimum of 30 semester hours) beyond the master's degree. School psychologists and counselors are served by this degree program. It is designed to be an interactive model of education and training involving local school districts, the Illinois State Board of Education Office, the Department of Educational Psychology, and other appropriate sources.

School Psychologists. Students who complete a sequence of courses leading to the Specialist degree are eligible for certification as school psychologists. The program is based upon standards established by the National Association of School Psychologists and certification requirements set forth by most states.

Counselors. All programs are individually planned to meet the professional objectives of the student. Typically, students prepare themselves to be directors of programs and counselor supervisors.

Admission and Retention. Persons may seek admission to the Specialist degree program either at completion of the undergraduate or master's degree. Applicants may have varied undergraduate majors. However, they are expected to have some course background in psychology and other related fields. They must have successfully completed at least 1 course in each of the following 3 areas: personality theories, psychological measurement, and child development. A minimal undergraduate grade point average of 2.7 ($A = 4.0$) is required for unconditional admission to the program. The appropriate faculty will review applica-

tions to determine acceptable course work consistent with the applicant's preparation, career aspirations, and the requirements of the program.

Since only a limited number of students can be accommodated by the program, applications should be received by March 1 for consideration for admission during the following academic year. Applications received after this deadline can be considered only if space is available.

The coordinator of the respective entitlement programs is responsible for initiating a review of each student's progress in the program each semester. Students who are not progressing satisfactorily or who are in violation of department, college, or Graduate School regulations may be dropped from the program.

Doctor of Philosophy Degree in Education

Advanced studies leading to a Ph.D. degree are offered by the Department of Educational Psychology. Individualized programs of sequential studies, based on a general core of foundation knowledges, are required for each candidate. Students along with their doctoral committee plan programs related to student background and interests, the professional requirements of the program, and the professional competencies of the faculty.

Faculty in the department provide research and professional competencies in counseling, psychological appraisal, instructional psychology, school psychology, and measurement and statistics.

Application. Students must apply to the chair, Department of Educational Psychology, Southern Illinois University at Carbondale, Carbondale, IL 62901-4618, (618) 536-7763. Specific questions about programs and how to apply should be directed to the Department of Educational Psychology at the address identified above or by phone.

Admission and Retention. Applications are reviewed by the department faculty and recommendations forwarded to the College of Education and the Graduate School. Test scores from the Graduate Record Examination are required. A personal interview with a candidate may be required.

The performance of each doctoral candidate is reviewed each semester. Maintenance of 3.0 grade point average and compliance with policies of the department, the college, and Graduate School are also required.

Core Requirements. Students are required to meet core competence in learning, measurement, statistics, research methodology, and affective behavior. Specific courses or other means used to satisfy these areas are determined by the department upon recommendation from the student's doctoral committee. Students are expected to bring to the doctoral program a background of course work and experiences commensurate with a master's degree in educational psychology that includes foundations in psychology, education, and other related areas.

Research, Teaching, and Practicum Experience. Each student is required to demonstrate professional competence through supervised experiences. These experiences include research, teaching, and personal interactions in consulting, psychometric, or counseling situations. It is recommended that doctoral students take an approved internship in their area of professional specialization. Such internships are usually of a year's duration and must be approved by the department.

Preliminary Examinations. All Ph.D. candidates must complete a preliminary examination over their doctoral course work before formal admission to candidacy. The doctoral committee with the concurrence of the department is responsible for the development and evaluation of the preliminary examination.

Doctoral Committees. Students are assigned a doctoral adviser upon admission to the program. Before the end of the first year of doctoral study a doctoral committee is constituted. At this time a new chair may be chosen to head the committee which assists and evaluates students in their program. The committee is also responsible for an oral examination over the completed dissertation and student's general knowledge of the professional field.

Electrical Engineering

Master of Science Degree in Electrical Engineering

Southern Illinois University at Carbondale offers graduate programs of study and research leading to the Master of Science degree in electrical engineering. The Department of Electrical Engineering provides a rich environment for educational and professional advancement in the following areas: digital systems, computer engineering, artificial neural systems, expert systems, pattern recognition, communication systems, information theory, signal processing, robust systems, control systems, robotics, power systems, power electronics, electromagnetics, microwaves, solid state electronics, gaseous electronics, laser electronics, optical computing, and biomedical instrumentation.

The programs of study provide a balance between formal classroom instruction and research, and are tailored to the individual student's academic and professional goals. Graduates of the program enjoy excellent employment opportunities and are highly recruited for positions nationwide in industry, government, and academia.

Admission

The program is open to qualified individuals with a Bachelor of Science in electrical or computer engineering who satisfy the minimum admission requirements set by the Graduate School and the additional requirements of the Department. Normally, a GPA of 3.0/4.0 is required by the electrical engineering department. Qualified applicants with Bachelor of Science in another branch of engineering, physics, chemistry, materials science, mathematics, statistics, or computer science may be able to enroll in the program with additional preparation. Admission to the program is granted by the chair of the department upon recommendation by the faculty.

Requirements

For the Master of Science degree with a thesis, 30 semester hours of credit are required for which six hours must be for thesis research performed under the supervision of a faculty member. The degree is awarded following a successful comprehensive examination on all the subjects covered in the candidate's program of study including the thesis.

For the Master of Science degree without thesis, 36 semester hours of credit are required of which three hours must be for a research paper performed under the supervision of a faculty member. The degree is awarded following a successful comprehensive examination on all the subjects covered in the candidate's program of study including the research paper.

Teaching assistantships, research assistantships, fellowships, and tuition scholarships are available on a competitive basis to qualified graduate students. Additional information about the program can be obtained from the Department of Electrical Engineering.

Engineering

The College of Engineering and Technology offers graduate programs leading to the Master of Science degree in civil engineering, electrical engineering, manufacturing systems, mechanical engineering, and mining engineering, and to the Doctor of Philosophy degree in engineering science. To support these graduate programs, the college has well equipped laboratories and computer facilities that are housed in a modern engineering and technology complex. Additional research opportunities and funding are provided through the Coal Research Center, the Materials Technology Center, and the Office of Research Development and Administration.

Master of Science Programs

See Civil Engineering, Electrical Engineering, Manufacturing Systems, Mechanical Engineering, or Mining Engineering.

English

The Department of English offers programs leading to the Master of Arts and the Doctor of Philosophy degrees with a major in English. Students enrolled in a program leading to the Master of Science in Education degree in secondary education or higher education may take courses in English to satisfy requirements for the teaching specialty. Students enrolled in the Ph.D. degree in education program may take courses in English for the elective portion of the program when permitted by the specific department participating in the degree.

Admission

Students seeking admission to the graduate program in English must first be admitted by the Graduate School before they can be admitted to the Department of English.

Students seeking admission to the M.A. degree program are strongly advised to take the verbal and advanced section of the Graduate Record Examination. This is especially true for those students wishing to compete for fellowship support. Those seeking unconditional admission to the Doctor of Philosophy degree program must present a score of the 70th percentile or above in the advanced section of the Graduate Record Examination.

Information about admission and the necessary admission forms to the graduate programs in English may be obtained by calling (618) 453-5321 or by writing: Director of Graduate Studies, Department of English, Southern Illinois University at Carbondale, Carbondale, IL 62901.

Transfer Credit

Within limits imposed by the Graduate School, transfer credits will be accepted by the Department of English subject to the following restrictions.

The student must petition the director of graduate studies indicating the number and level of hours being submitted for credit, where and when the work was done, and which grade was received. As nearly as possible, the course to be transferred should be equated with a course offered by the SIUC Department of English. The student will then be assigned to the appropriate faculty member, who will examine the student over the material of the course and recommend whether the transfer credits should be accepted and whether the course satisfies the course distribution requirements of the department. The director of graduate studies will act on the recommendation and forward it to the proper authorities.

Retention

In the entire graduate program, the student may accumulate up to 3 hours of work below *B,* so long as a 3.0 M.A. or 3.25 Ph.D. average is maintained. If the student has accumulated more than 3 hours, but fewer than 10 hours, of grades below *B,* these must be replaced by an equal number of hours of *A* or *B* in addition to maintaining the required average. That is, the minimum number of semester hours of course work may be increased from 30 to a maximum of 36. A student who accumulates more than 9 hours of *C* will be dropped from the program.

A student who is granted a deferred or incomplete grade must complete the work by the end of the next term in residence. Exception to this rule will be made only in a very special case and must be made through petition to the graduate studies committee. A student who has accumulated more than 6 hours of such work will not be allowed to register for more course work until the total of deferred work is reduced to not more than 3 semester hours. Deferred or incomplete work will be regarded as finished when a student has submitted all examinations, papers, etc., to the instructor. Deferred or incomplete grades in ENG 595, 600, and 601 are not included in the above regulations.

Course Work

Students may offer work from outside the department (in a single field or in two or more related fields) toward either the Master of Arts or the Ph.D. degree provided that the work does not interfere with regular requirements of the Department of English and has relevance to their program.

Master of Arts Degree

The Master of Arts degree major in English requires satisfactory completion of 30 semester hours, of which 15 must be earned in 500-level courses at Southern Illinois University at Carbondale. M.A. students may elect to focus their study either on a literature concentration or on the study of literature combined with a concentration in either composition or creative writing.

All students must satisfy the following requirements:

1. *Core courses.*
   English 502. — 3 hours
   Four literature courses: two from Group I, representing two historical periods; and two from Group II, representing two historical periods.— 12 hours
   Group I:
   (a) Anglo-Saxon and Medieval English literature
   (b) Renaissance and 17th Century English literature
   (c) Restoration and 18th Century English literature
   (d) 19th Century English literature
   Group II:
   (a) American literature before 1885
   (b) American literature since 1885
   (c) Modern British literature
   (d) Modern Continental literature
2. *Concentrations.* Satisfactorily complete one of the concentrations detailed below.
3. *Foreign Language.* This requirement may be satisfied by completing, with an average not less than *B,* two years of college-level work in one foreign language or FL 488, a research-tool course, or the equivalent. Equivalent work will be judged on an ad-hoc basis by the director of graduate studies. Otherwise the requirement must be satisfied by passing the ETS examination.

4. *Research paper/thesis.* This requirement may be satisfied either by submitting to the director of graduate studies two copies of a research paper which has received a grade of not less than *B* in a 500-level English course (a composition course for students in that concentration), or by taking English 599 (3 hours) and writing an acceptable thesis.
5. *Final examination.* This requirement must be satisfied as specified below.

LITERATURE CONCENTRATION

- English 401 or 403 — 3 hours
- Two additional literature courses so that a student has covered three periods in Group I and three periods in Group II.— 6 hours
- Electives (may include English 599) — 6 hours
- Satisfactory completion of a written examination over six historical periods and a reading list. If a student writes a thesis, the examination is oral over the thesis and course work.

COMPOSITION CONCENTRATION

- English 401 — 3 hours
- English 501 — 3 hours
- English 581 — 3–9 hours (581 may be taken two or three times so long as the topic differs from one matriculation to the other. The additional 3 or 6 hours may, with the permission of the director of graduate studies, substitute for 3 or 6 hours of the other course requirements in the composition concentration.)
- Either English 490 or 491 — 3 hours
- One of the following: English 403, English 596, or Speech 440 — 3 hours
- Satisfactory completion of a written examination over the literature and composition course work and a reading list. If a student writes a thesis, the examination is oral over the thesis and the course work. (Students choosing to write a thesis may substitute English 599 for one of the courses in the composition concentration.) — 3 hours

CREATIVE WRITING CONCENTRATION

- English 492 — 3–6 hours
- English 592 — 3–6 hours

(Either English 492 or 595 may be repeated once so long as the topic differs from one matriculation to the other.

- English 594 — 3 hours
- English 599 — 3 hours
- Satisfactory completion of an oral examination over the thesis and the course work.

Doctor of Philosophy Degree

Students must apply formally for admission to the Doctor of Philosophy degree program, including students who have earned a master's degree at SIUC. Admission to the Ph.D. program is decided by the graduate studies committee, which makes its decision according to the following criteria:

1. An M.A. degree in English or its equivalent
2. Appropriate grade-point average (normally, a 3.25 is the acceptable minimum)
3. A satisfactory score on the GRE advanced literature examination (normally the 70th percentile will constitute an acceptable minimum score)

A full-time student holding a master's degree can complete the doctoral program in two years, though most prefer three. Students are considered Ph.D. candidates when they have (1) completed the prescribed course of study, (2) satisfied the research-tool requirements, (3) passed the preliminary examination, and (4) been recommended by the English graduate faculty. The Graduate

School recognizes students as Ph.D. candidates after it receives notification that the students have passed the preliminary examinations. Students must be admitted to candidacy at least 6 months prior to the final examination on the dissertation.

Course of Study

There is no prescribed number of hours for the Ph.D. degree in English. Required courses are as follows:

1. If students have never had courses, graduate or undergraduate, in Chaucer, Shakespeare, and Milton, they are required to remedy this deficiency;
2. Students are required to have taken at least one graduate course in each of the 6 major fields (see M.A. course requirements) and ENG 401 and 403 or the equivalents;
3. In addition, courses may be prescribed by the students' advisory committee to insure that they will have a comprehensive knowledge of a major and 2 related minor areas;
4. Ph.D. students are normally required to complete for credit, with no grade lower than *B,* at least one 500-level course in each minor area of study.

Research Tool Requirements

A student may satisfy the research tool requirement by fulfilling 1 of the 3 options listed below. The choice of option and languages selected must be approved by the student's advisory committee.

1. A reading knowledge, demonstrated by examination, of 2 languages in addition to English. Each must be a language in which there is a substantial literature for research and which is germane to the student's field. Foreign students may specify their native language as one of the foreign languages, provided it is one which meets the above requirements. Foreign students choosing this option will be required to demonstrate fluency in oral and written English.
2. A command of one foreign language and its literature demonstrated by examination or by at least 3 courses numbered 400 or above, or the equivalent, with an average grade not lower than 3.0. Satisfaction of this requirement normally requires the equivalent of 3 years of study at the college level with grades of *B* or better. Foreign students may use their native languages provided those languages are appropriate to the particular fields of major emphasis. Foreign students choosing this option will be required to demonstrate fluency in oral and written English.
3. A reading knowledge of a single foreign language, demonstrated by examination, and a special research technique or collateral field of knowledge. A special research technique should represent the acquisition of any special skill that will effectively contribute to the research proficiency of the student (provided that such a skill is not an assumed or traditional part of the major). The collateral field of knowledge is expected to broaden the student's scholarly background by permitting exploration of knowledge in a field related to the major.

To satisfy the research technique or collateral field requirement the student may complete a total of 2 semester courses numbered 400 or above, with an average grade not lower than 3.0.

The department has expanded its Ph.D. program into interdisciplinary studies on a cooperative basis with departments that deal with one pertinent subject matter and which are interested in such interdisciplinary cooperation, e.g., the Departments of Philosophy, Foreign Languages and Literatures, History, Cinema and Photography, Speech, Theater, Sociology, etc. Permission for an inter-

disciplinary minor must be approved by the student's committee and the graduate studies committee.

Preliminary Examinations. Students on a fellowship or a graduate assistantship will be expected to take preliminary examinations no later than 2 or 3 years, respectively, after receipt of their M.A. degree.

Preliminary examinations covering 3 areas are prepared and graded by the student's advisory committee, and will cover 3 areas. A major area examination consists of one 6 hour written exam, the minor areas of two 3 hour written exams. Preliminary examinations will be scheduled only twice in a single term.

At the discretion of the committee, a 2 hour oral examination may follow the decision on the 3 written examinations.

English as a Foreign Language

(See Linguistics for program description.)

Foreign Languages and Literatures

The Department of Foreign Languages and Literatures offers graduate programs leading to the Master of Arts degree in foreign languages and literatures with concentrations in French, German, or Spanish. A student whose degree program makes provision for a graduate minor may follow a program of study leading to a minor in these same subjects as well as in Russian.

Students may complete requirements for a teaching specialty in French, German, Russian, or Spanish for the Master of Science in Education degree majoring in secondary education or in higher education.

Students seeking the Master of Arts degree will be governed by the policies of the Graduate School with respect to admission, minimum credit hours, scholastic attainment, residence, and maximum time limits for completion of the program.

Admission

In addition to meeting requirements of the Graduate School, the applicant for admission to the programs in the Department of Foreign Languages and Literatures should hold a bachelor's degree with a major or at least 18 semester hours (27 quarter hours) of courses on the junior-senior level in French, German, or Spanish. Students who meet requirements for admission to the Graduate School but do not meet departmental requirements may register as unclassified students for specific graduate courses in the department only with consent of the instructor and authorization from the head of their language section.

Requirements for Master of Arts

Students who have been admitted to graduate study will plan their course of study in periodic consultations with their graduate advisers. During such consultations, each student will decide upon either a thesis or a non-thesis (i.e., research paper) program. This program should be made before the end of the second semester of study. Students choosing to write a thesis will register for the thesis course (599), which provides from one to six semester hours of credit. Regardless of whether the thesis or non-thesis program is chosen, every candidate must pass a comprehensive written examination and a final oral examination at a time specified by the language section. For the student writing a thesis, this final oral examination is primarily a defense of the thesis.

A minimum of 30 semester hours are required, of which at least 15 must be in 500-level courses. All students must take FL 566-3, Bibliography and Research Techniques, which should be taken as early as possible during the course of studies; also required are the linguistics structure (411) or history (412) of the language concentration. FL 436-3, Methods in Teaching Foreign Language, is recommended for all teaching assistants and those who intend to make teaching their career. With approval of the adviser, graduate courses outside the language in which the degree is being taken may be counted towards the total unit requirement. Beyond such requirements as are specified for each language, students must demonstrate proficiency in a second foreign language by passing an exam in that language or by successfully completing approved course work in that language.

FRENCH

The program of study leading to the Master of Arts degree with a concentration in French is planned to give a balanced overview in the areas of French language, literature, and civilization, and to allow a high degree of flexibility in the elaboration of the student's total program in French. Required courses are:
FL 566 Bibliography and Research Techniques
FR 411-3 Linguistic Structure of French
or
FR 412-4 History of the French Language
FR 470-3 Backgrounds of French Civilization
FR 510-3 Masterpieces of French Literature
FR 525-3 Advanced Language Skills.

The student will consult with the graduate adviser in determining a suitable program beyond those requirements.
Thesis or Research Paper (option 1 or 2 is required).

Option 1. If writing a thesis either (a) 6 hours of FR 599 or (b) 3 hours of FR 599 plus 3 hours of an elective French graduate course.

Option 2. If writing a research paper either (a) 4 hours of elective French graduate course work, plus 2 hours of FL 506 or (b) 6 hours of elective French graduate course work.

GERMAN

The program of study leading to a Master of Arts degree with a concentration in German is planned to emphasize either German language and linguistics or German literature; a minor must be completed in the other of these two fields. Although GER 411, Linguistic Structure of German is not required, it is strongly recommended for prospective teachers of German. Required courses are:
FL 566-3 Bibliography and Research Techniques
GER 411-3 Linguistic Structure of German
GER 412-3 History of the German Language
One course in an older period of a Germanic language. (GER 510-3, Middle High German, is recommended, but an alternative course could be GER 512-3, Historical German Dialects.) The student will consult with the German adviser in determining a suitable program beyond these requirements.
Thesis or Research Paper (option 1 or 2 is required).

Option 1. If writing a thesis either (a) 6 hours of GER 599 or (b) 3 hours of GER 599 plus 3 hours of an elective German graduate course.

Option 2. If writing a research paper either (a) 4 hours of elective German graduate course work, plus 2 hours of FL 507 or (b) 6 hours of elective German graduate course work.

SPANISH

The program of study leading to the Master of Arts degree with a major in Spanish is designed to survey at least 2 of the following: Hispanic linguistics, Peninsular literature, and Spanish American literature. Requirements are:
FL 566-3 Bibliography and Research Techniques
SPAN 411-3 Linguistic Structure of Spanish
or
SPAN 412-3 History of the Spanish Language
SPAN 410-3 Advanced Language Study.

The student will consult with the graduate adviser in determining a suitable program beyond those requirements.
Thesis or research paper (option 1 or 2 is required). SPAN 599 or (b) *Option 1:* If writing a thesis, either (a) 6 hours of 3 hours of SPAN 599 plus 3 hours of an elective Spanish graduate course. *Option 2:* If writing a research paper, either (a) 4 hours of elective Spanish graduate course work, plus 2 hours of FL 509 or (b) 6 hours of elective Spanish graduate course work.

Requirements for Master of Science in Education

The Master of Science in Education degree majoring in secondary education with a teaching emphasis in French, German, Russian, or Spanish requires a minimum of 30 hours, at least 13–17 semester hours in the subject matter area and 13–17 semester hours in secondary education. The Master of Science in Education degree major in higher education with a teaching emphasis in a foreign language requires at least 20 semester hours in the subject matter and 12 semester hours in higher education.

Further details as to specific requirements will be found in the respective program descriptions. For either degree, if the teaching emphasis is Russian, Russian 415 is required.

Forestry

The Department of Forestry offers advanced courses for the Master of Science degree with a major in forestry. In addition, curricula are available which permit graduate students with an interest in forestry to pursue their interest in Doctor of Philosophy degree programs in other departments.

Admission

In addition to requirements set forth by the Graduate School, the Department of Forestry requires the following:

1. A minimum grade point average of 2.7 is required for admission ($A = 4.0$). The department will permit conditional entry between the 2.5 and 2.7 grade point average level. A grade point average of 2.7 or higher is required for stipend eligibility when available.
2. The student is required to provide proof of proficiency in technical writing. Normally an expository essay is required to evaluate whether the student should have remedial grammar or writing courses.
3. Three letters of recommendation from former professors, employers, or other responsible individuals are required.
4. The aptitude test of the Graduate Record Examination is required of all applicants. This test may be taken during the first semester of residence.

5. Each applicant must complete the statement of interest form. This form indicates the student's area of interest in forestry and the faculty member with whom the student desires to study. All correspondence should be directed to the chair of the Department of Forestry.

Retention and Completion Requirements

Upon the graduate student's arrival on campus, an advisory committee of 3–5 members of the graduate faculty will be formed to guide the student's work. The same committee will be responsible for preparation and administration of thesis exams and also for the review and evaluation of the thesis. The advisory committee chair and at least one other member of the committee shall be members of the forestry department. The other members may be selected from any academic unit including forestry.

Summary of Events.

1. The deadlines for receipt of applications and official transcripts in the office of the Graduate School are (a) the second Saturday in July for admission to the fall semester (b) the last Saturday in November for admission to the spring semester (c) the last Saturday in March for admission to the summer term.
2. Letters of recommendation should reach the forestry department chair by the same dates as above.
3. Acceptance by department and Graduate School should be announced one month or earlier than the desired matriculation date. A thorough review will be made by a screening committee of forestry department graduate faculty and the departmental adviser. Students rejected for admission will also be notified.
4. Registration for first semester's work after student's acceptance by the department.
5. Appointment of advisory committee chair, written plan for course work, and selection of tentative thesis areas all within first 2 months of residence.
6. Preparation of formal written thesis outline and preparation of research proposal by the eighth week of the second semester.
7. Completion of final, typed or reproduced review copies of thesis and submission of advisory committee at least 3 weeks in advance of oral defense of thesis. Handwritten or incomplete work will not be acceptable.
8. Oral exam to be followed by completion of required approval forms. If thesis requires modifications, this should be accomplished immediately to reach the graduate dean's office in due time set by the Graduate School. One bound copy of the thesis will be provided for the department, 1 for the chair of the advisory committee in addition to 2 copies required for the Graduate School and a copy for the author. Additional copies may be required for projects sponsored by outside agencies.

Master of Science Programs

The Department of Forestry offers 3 areas of concentration with specialties within each. Combination of emphasis is possible.

FOREST RESOURCE MANAGEMENT CONCENTRATION

Under this heading, a graduate program may be elected with an area of emphasis in forest management, forest ecology, forest resources measurements, forest resources economics, forest genetics, or forest policy and administration.

OUTDOOR RECREATION RESOURCE MANAGEMENT CONCENTRATION

Emphasis may be made in social, managerial, or natural science aspects of wildlands recreation and park planning and management in the given graduate program depending on the student's interest.

WOOD SCIENCE AND TECHNOLOGY

Physical, mechanical, or biological properties of wood or woodbase materials may be studied. Also, the production and marketing of forest products may be selected.

A specialty in environmental studies in forestry is available.

Assistantships and Fellowships. Research assistantships are sponsored each year by the McIntire-Stennis Cooperative Forest Research Act. Teaching assistantships funded by the School of Agriculture are also available.

In addition to general awards made through the Graduate School, stipends for research studies are available from the Federal Forest Service, the U.S. Department of Interior, other federal and state agencies, and private corporations.

Requirements

Since the normal minimum requirement for graduation is 32 semester hours, the completion of degree work for students holding assistantships should be accomplished within four semesters (including summer) which is also the normal maximum span for financial aid.

The student must attain a grade of *B* or better for all courses specifically required in the student's academic program and which are offered by the Department of Forestry.

To gain teaching experience, graduate students are expected to assist in the classroom or laboratory for at least 1 academic semester (20 hours per week) during their tenure with the forestry department. The remaining semesters will also involve either research or teaching at the rate of 20 hours a week. All graduate students are required to enroll in Seminar (FOR 501) for 2 semesters for which they will receive 1 semester hour of credit.

Staff

In addition to the faculty listed in the Graduate School Catalog, several adjunct professors also hold appointments with the forestry department. These professors are assigned to the Forest Science Laboratory of the North Central Forest Experiment Station and the Crab Orchard National Wildlife Refuge. They advise and serve on graduate guidance committees.

Research Facilities Land. SIUC is well endowed with a number of different forest types which are available to the forestry department for teaching and research purposes. In particular, we are conducting or planning research and demonstration programs on forest plots and experimental fields of the 3000 acres of the University and its experimental farms. We also have access to wooded lands of the 600 acres of the Touch of Nature Environmental Center, 400 acres at the Pine Hills Field Research Station, and other forests.

Through various memoranda of understanding and special use permits we have use of forested lands and plots on the 43,000 acres of the Crab Orchard Wildlife Refuge, the 250,000 acres of the Shawnee National Forest, and the 4000 acres of the Trail of Tears State Forest, all of which are within an hour's drive of Carbondale. In addition, we can conduct basic research on the 640 acres tract of the Beall forest near Mt. Carmel, Illinois. The forests on this land represent one of the last central hardwoods remnants of virgin bottomlands and slopes and are under the jurisdiction of the Illinois Nature Preserves Commission.

Physical Facilities. A research greenhouse operated in cooperation with the U.S. Forest Service at the Tree Improvement Center on the western side of the campus is in operation for research and graduate teaching. Greenhouses and growth chamber facilities in the agriculture greenhouses in conjunction with the Department of Plant and Soil Science are also available.

A variety of laboratories for all phases of forestry research as well as access, through cooperative agreements, to laboratory facilities with other agencies on the campus are in service. The Forest Science Laboratory of the U.S. Forest Service, located adjacent to the forestry department offices, is available to our graduate students for research and other functions. In addition, a wood testing laboratory and a large wood products pilot plant is accessible at SIUC College of Technical Careers.

Geography

The Department of Geography offers programs that lead to the Master of Arts, Master of Science, and the Doctor of Philosophy degrees in geography. Students may also complete requirements for the Master of Science in Education degree in secondary education with a teaching emphasis in geography.

Geography is the discipline that deals with the relationship between human beings and their environment. The Department of Geography emphasizes the applied aspects of this theme, environmental analysis, planning, and management. The graduate program includes the several dimensions of this emphasis, e.g., the role of resources in economic development and regional planning from physical/biological, technological, socio-economic, policy, and spatial viewpoints. Students take courses that give them a foundation in these dimensions of environmental planning and management through a core program, then develop an area of strength within this theme. Students also develop the analytic and research skills appropriate to their emphasis.

The graduate program stresses a problem-solving perspective, for which habits of critical analysis and dialogue are essential. Students take the initiative in designing and carrying out their programs with the guidance of an advisory committee and the departmental faculty. Geography maintains major linkages with many other departments. Courses and faculty expertise in other departments complement those in geography, and students are encouraged to take advantage of this. Each student's progress is assessed at regular intervals by the faculty, and the student is notified of the faculty's assessment. The student is expected to show continued progress in carrying out the program of study, and in developing habits of scholarship and professionalism.

Requirements for the Master of Arts and Master of Science Degrees

Advisement. Students newly admitted to the master's degree program are advised by the graduate program director, with the assistance of departmental faculty. Students choose a permanent adviser at the end of the first semester in residence. The choice of permanent adviser and advisory committee is made in consultation with the graduate faculty, taking into consideration such matters as faculty expertise and faculty advisee loads.

Degree Requirements. To obtain the master's degree, the student shall:

1. Complete all degree requirements specified by the Graduate School, and explained under degree requirements, master's degree program in the *Graduate Catalog.*

2. Include as required courses the following: GEOG 500-2, Principles of Research, during the first fall semester in residence; GEOG 501-2, Seminar in Geographic Research, the following semester; GEOG 410, Techniques in Geography; and one research seminar.
3. In consultation with an adviser, develop a program of study, identifying courses to be taken, research skills to be developed, deficiencies to be rectified. This shall be approved by the faculty. The program of study shall include a core of substantive courses in geography, as explained in the policy statement on core curriculum for master's degree students, available from the graduate program director. The program of study may include non-geography courses. The graduate faculty will meet to review and approve/disapprove the program of study of each master's degree student enrolled in GEOG 500. An approved program of study will be filed with the graduate program director and department chair as part of GEOG 500.
4. Develop a thesis or research paper proposal. The thesis or research paper proposal must be approved by the student's master's advisory committee before the student registers for GEOG 599, Thesis or GEOG 593, Research in Geography. A total of 4–6 credit hours of GEOG 599 may be awarded for a thesis at the discretion of the advisory committee upon final examination on the thesis (see #5 below). A total of 2–3 credit hours maybe awarded for a research paper.
5. Submit a thesis or research paper to the advisory committee at least 2 weeks before the comprehensive examination. A student who writes a thesis will be examined by the committee, at a meeting that may be attended by other faculty and students. A research paper will be evaluated and approved by the advisory committee without public presentation.
6. Complete a comprehensive examination. The statement of departmental policy on the master's comprehensive examination is available from the graduate program director. The comprehensive examination and evaluation of thesis or research paper shall be at least 6 weeks prior to the student's projected graduation date. Upon approval of the comprehensive examination and the thesis or research paper, the advisory committee will request the chair of geography forward to the Graduate School the recommendation that the master's degree be awarded.

Master of Science in Education Degree. This degree is available to applicants who consider teaching of geography as a career from the College of Education. For further details see the program statement for secondary education or higher education.

Accelerated Entry into a Doctoral Program. After completion of one semester of residence in the Master of Arts or Master of Science degree program the student may petition the graduate faculty for direct entry into the Ph.D. degree program. Prerequisite to petition is outstanding performance in GEOG 500, Principles of Research as judged by a majority of the faculty and clear promise of early development of requisite research skills. Additional evidence of a student's readiness to begin doctoral work includes undergraduate and graduate records, scores on exams such as the GRE, standardized tests, and reference letters. Students must meet all retention and exit requirements for the regular doctoral option. The student must submit the application materials required for regular admission to the Ph.D. degree program.

Requirements for the Doctor of Philosophy Degree

The doctoral degree in geography is a specialized research degree. The doctoral program assumes a broad background comparable to that provided by the department's masters core. It is designed to develop a comprehensive yet critically

analytic knowledge of theory, literature, research design, and application related to environmental analysis, planning, and management. The doctoral student will emphasize two subfields in which to propose creative research.

Advisement. The doctoral student initially is advised by the graduate program director. Before the end of the first term of doctoral work, the student will select an adviser and they jointly will recommend a doctoral program of study and committee members to the graduate faculty for approval. The student and the doctoral committee will ascertain appropriate tools and cognate courses; proficiency in these will be certified by the doctoral committee. It is recommended that all doctoral students have a minimum of one semester of teaching or research assistant experience.

Degree Requirements. To obtain the Doctor of Philosophy degree, the student shall:

1. Complete all degree requirements specified by the Graduate School, and explained under degree requirements, doctoral degree program in the Graduate Catalog.
2. Include in the course of study the following: GEOG 500-2, Principles of Research during the first fall semester in residence; GEOG 501-2, Seminar in Geographic Research in the following semester; GEOG 510, Multivariate Techniques in Geography; and 3 research seminars.
3. Demonstrate a broad background comparable to the department's masters program by a procedure to be specified by the graduate faculty. The statement of departmental policy on core curriculum for doctoral students is available from the graduate program director.
4. In consultation with an adviser, develop a program of study, identify courses to be taken, research tools to be developed, general dissertation topic, and names of adviser and doctoral committee members. The graduate faculty will review the tentative program of study in a meeting at the end of GEOG 500, and provide advice for modifications. The graduate faculty will meet at the end of GEOG 501 to approve/disapprove the program of study. An approved program of study will be filed with the graduate program director and departmental chair as part of GEOG 501.
5. Pass a comprehensive (preliminary) examination. Upon completion of program of study, the student will complete a written and oral comprehensive examination in 2 subfields that relate to the student's research emphasis. The written portion of the comprehensive examination will be prepared by the student's doctoral committee, which will evaluate the performance and judge the student's success or failure. The examination then will be circulated to the graduate faculty. The oral examination will take place not less than 1 week or more than 2 weeks from the time of the written examination. The oral examination will be conducted by the student's doctoral committee with appropriate opportunity for all graduate faculty to ask questions. The student's success or failure of the oral examination will be judged by the student's doctoral committee. A student who fails the written or oral comprehensive examination may retake the examination after appropriate remedial action, as specified by the doctoral committee. A student who fails the second written or oral examination will be dropped from the doctoral program.
6. Having passed the comprehensive examination, present a dissertation proposal at an open meeting of the Department of Geography. The written and oral examination and presentation of the dissertation proposal are prerequisite to admission to candidacy.
7. Complete a dissertation. The student's written dissertation will be circulated to members of the doctoral committee at least 2 weeks in advance of

the proposed dissertation defense. The doctoral committee will issue a public invitation a week in advance of the scheduled date of the dissertation defense. After necessary revisions have been made, the dissertation will be sent to the student's doctoral committee for final approval. The judgment of the doctoral committee will be expressed to the student and forwarded to the chair of the department for recommendation to the Graduate School for conferring of the doctoral degree.

Geology

The Department of Geology offers programs leading to the Master of Science degree and the Doctor of Philosophy degree in geology.

Graduate Programs

The objectives of the graduate degree programs are to develop the student's competence in the basic fields of geology and to provide for specialization dependent on student and faculty interest. Facilities and staff are available for studies involving surface and subsurface mapping, structural geology, petrology, paleontology, micropaleontology, paleoecology, coal petrology, coal geology, energy resources, stratigraphy, sedimentation, Pleistocene geology, sedimentary petrology, sedimentary environments, crystallography, mineralogy, low temperature geochemistry, ore deposits, petroleum geology, environmental geology, geomorphology, hydrogeology, and applied and solid earth geophysics. Many of the faculty are actively conducting research in which statistical and computer techniques are applied to problem solving in the earth sciences. Interdisciplinary research with other departments is encouraged.

Southern Illinois and adjacent areas offer a wide variety of geological conditions ideal for individual study and research. Experienced staff members work closely with students and provide individual assistance when necessary. The Illinois State Geological Survey and several major companies in the petroleum and coal industries actively support geological work in this area.

The major thrusts of the Ph.D. degree program focus on the geology of energy and mineral resources and geologic aspects related to exploration, development, utilization, reclamation, and environmental impact.

Students must be admitted unconditionally to the Graduate School before they can be officially admitted to either graduate program in geology. Admission to the graduate programs in geology is based on an evaluation of the preparation, ability, and promise of the applicant. Prerequisites for admission include: 1) receipt of GRE test scores sent directly to the Department of Geology; the Geology Advanced Test is required; 2) completion of department application forms which are available on request from the department; and 3) receipt of at least 3 letters of recommendation from professors, academic advisers, former employers, or others familiar with the applicant's academic performance, research, or other relevant work. The Department of Geology normally admits graduate students for entrance in the fall semester; however, applicants will be considered for spring admission. The students will be expected to have satisfactorily completed at the undergraduate level the equivalent course work in the basic sciences required for a Bachelor of Science degree in geology at SIUC.

A student admitted with course deficiencies may be required to complete or audit some undergraduate courses. First year teaching assistants are required to enroll in and complete GEOL 500. Other specific requirements will be determined by the student's advisory committee and the department chair. Students are evaluated on an individual basis, their programs are determined by their career goals and the results of informal interviews with individual faculty members.

Requirements for the Master of Science Degree

A total of 30 hours of graduate work completed with a grade point average of 3.0 or better constitutes the minimum credit requirement for the master's degree.

Courses taken are determined by the student and an advisory committee. The student will not be allowed to apply more than 8 hours of independent study or research courses toward the master's degree (exclusive of thesis credits).

A student majoring in geology may select a minor field. The minimum course work should then include 20 hours of geology and 10 hours in the minor field.

A thesis subject must be approved by the chair of the advisory committee at least 20 weeks before the date of graduation.

A final oral examination, primarily concerned with defense of the thesis is administered as the last step before graduation. The student may be asked any questions the committee feels are relevant.

In order to pass the final oral examination, students must receive a favorable majority vote from their thesis committee meeting in formal session. Should the student fail the final oral examination, the student, upon concurrence of a majority of the committee, may arrange a time for a re-examination not less than 30 nor more than 120 days after the first examination. Students who fail the final orals on their second attempt will be ineligible for the master's degree from the Department of Geology.

Two copies of the approved thesis must be presented to the Graduate School at least three weeks prior to graduation, and a third copy must be presented to the Department of Geology.

Requirements for the Doctor of Philosophy Degree

Students entering the doctoral program in geology should meet, as a minimum, the requirements for the master's degree program listed above. However, exceptional students may be considered for direct baccalaureate degree entry or accelerated entry into the doctoral program. This requires approval by a majority vote of the faculty.

The Ph.D. degree program in geology is based primarily on the student's successful conduct of original research and presentation of an acceptable dissertation describing the results of that research. To achieve this goal, the student must meet the criteria established by the University, the Graduate School, and the Department of Geology as described below.

Students having completed a master's degree program or its equivalent must, upon entering the Ph.D. program, submit themselves to a preliminary counseling conference at the beginning of their first semester in the program. The format of the preliminary counseling conference is established by the faculty, and a copy of the procedures may be obtained in the departmental office. The purpose of this conference is to allow the students and their advisers to establish a suitable curriculum and research program commensurate with their backgrounds, interests, and professional goals. Nevertheless, each student is expected to take graduate level courses (excluding readings, independent studies, and internship) of at least 3 credits each from at least 4 different faculty members at SIUC, 3 of whom must be in the Department of Geology. The normal post-master's credit requirement is 60 semester hours, 30 of which may be 600 level dissertation credits.

Before the end of their second year in the program, students shall have (1) established a dissertation committee including their adviser and 4 additional members, one of whom must be from a department other than geology; (2) demonstrated competence in at least one research tool (the student's advisory committee will determine the requirements and research tool competence); and (3) presented themselves to the advisory committee for a preliminary written and oral examination. The format of the preliminary examinations shall be

established by the faculty and a copy of the procedures may be obtained in the departmental office. Students who fail the preliminary examinations and wish to remain in the program may, with faculty consent, retake the examinations during one of the next two examination periods. Students who fail the second written-oral examination will be dropped from the program. A student having passed the preliminary examinations and having demonstrated competence in at least one research tool as required by the advisory committee, shall be admitted to candidacy for the Ph.D. degree. A second research tool, if required by the advisory committee, must be mastered before the candidate may defend the dissertation.

As a candidate for the degree of Doctor of Philosophy in geology, the student is expected to make normal progress toward the successful completion and presentation of original research. The students must complete all requirements for the degree within a 5 year period after admission to candidacy. Ordinarily, the doctoral student should expect to spend a minimum of 2 years beyond the master's degree, or its equivalent, in residence. Students will be required to present an acceptable dissertation describing original research performed with minimal supervision and deemed by the advisory committee to be of such quality as to merit publication in an appropriate professional journal.* A final oral examination will be held after completion of the doctoral dissertation. This examination will concentrate on the defense of the dissertation but is not restricted to the dissertation topic or area.

Assistantships

Teaching assistantships are awarded and supervised by the Department of Geology. Research assistantships are usually available only from research grants of individual faculty members and are supervised by the faculty member in receipt of the sponsoring grant. Research assistantship awards require prior approval of the assistantship committees of the department.

As a matter of policy, the Department of Geology does not ordinarily provide any student working for a master's degree financial support for more than two years. A Ph.D. candidate will not ordinarily be supported for more than 3 years post master's or master's equivalent. Requests for relaxation of this policy must be made in writing to the department chair.

Health Education

The Department of Health Education offers four concentrations for the Master of Science in Education degree in health education: school health education, community health education, industrial health, and safety education. The department participates in the Ph.D. degree in education. Students interested in seeking employment in the area of industrial safety or health services administration are encouraged to consult with the chair regarding appropriate courses.

Master of Science in Education Degree

Admission. Permission to enter graduate programs in health education is by application approval of the department and fulfillment of the following extra requirements:

1. Admission to the Graduate School.
2. Five letters of reference from persons who can evaluate past performance and potential for graduate work should be sent to the office of the department chair.

*Two research tools are required. The research tool is a practical knowledge of a foreign language or a computer language.

3. Miller Analogies Test scores must be submitted. Students may take this test on the campus of SIUC.
4. Candidates for the master's degree must have a 2.70 grade point average (*A* = 4.0) to be admitted in good standing. Students with grade point averages below 2.70 but above 2.40 may petition the department and, if accepted, will be admitted conditionally in accordance with regulations of the Graduate School.

Additional admission requirements for the concentration in school health education or safety education follow.

Candidates should be certified for teaching. Exceptions to this requirement may be appealed to the academic affairs committee of the department. Students enrolled in HED 434 must have psychomotor and communication skills. If questions arise concerning an individual student, an assessment will be made if necessary minimum psychomotor and communications skills are present. This assessment will be utilized to determine whether the individual student possesses these basic skills to enter the first aid class. The final assessment of the skills of each student will be made by the first aid coordinator in the Department of Health Education.

Additional admission requirements for the concentration in community health education:

1. Candidates must have undergraduate preparation in a discipline providing an adequate foundation for graduate work in community health education: i.e., nursing, biological science, health science, or social sciences.
2. Candidates planning to teach will be expected to meet certification requirements for teachers in Illinois.

Degree Requirements

SCHOOL HEALTH AND SAFETY EDUCATION

In school health and safety education, a minimum of 24 hours in health education including a common core of 8 semester hours (533a, b) and a total of 32 graduate hours are required for the degree.

COMMUNITY HEALTH EDUCATION

A total of 40 semester hours, 8 of which must be gained through 12 weeks of practical fieldwork experience, is required. In addition to the common core courses (533a-4 and 533b-4) and a thesis (599-3 to 6), the community health education concentration requires HED 401-3, 488-3, 489-3, 500-3, and 526-3. A minimum of 2 semester hours in communications or group work methods is encouraged.

INDUSTRIAL HEALTH

The industrial health option requires a total of 40 semester hours including a common core of 8 semester hours (533a,b). A practicum which includes experience in industry is required of all candidates. A minimum of 26 hours in health education including a common core and the practicum are required for the degree.

Doctor of Philosophy Degree in Education

The Department of Health Education participates in the doctoral program in education with a concentration in health education. See the description of the Ph.D. degree in education.

Inquiries regarding application should be directed to the chair of the Department of Health Education.

Higher Education

Graduate Study in Higher Education

The Department of Educational Administration and Higher Education provides graduate study leading to the Master of Science in Education degree in higher education and to a concentration in higher education for the Doctor of Philosophy degree in education.

The graduate program in higher education offers students an opportunity to study and explore the concept of higher education as a field of study. The faculty of this program encourages and assists students in developing a lifetime commitment to the study of higher education. They also provide pre-service and in-service preparation for persons who are teaching or serving as administrators or who expect to teach or serve as administrators in two-year and four-year colleges and universities, and related post-secondary educational institutions and agencies.

Financial Aid

The Department of Educational Administration and Higher Education makes an effort to find financial support for its graduate students through a number of graduate assistantships available throughout the University in different administrative offices and residence halls. It assists students in their application for fellowships and special awards. Students wishing to expand their administrative and teaching skills through a variety of paid experiences should consult their academic advisers about possible financial assistance, including graduate fellowships. Since a personal interview is required for almost all graduate assistantship positions, applicants should arrange to visit the campus as early as possible. A very limited number of paid internships are available through neighboring institutions.

The Master of Science in Education Degree

The Department of Educational Administration and Higher Education offers a program in higher education leading to the Master of Science in Education degree. The emphasis of this degree is to provide individuals with the background and skills important to accepting a wide range of teaching and administrative positions in higher education.

Application. Inquiries requesting application materials should be directed to the chair of the Department of Educational Administration and Higher Education.

Admission and Retention. Students applying for admission are encouraged to have had some part-time or full-time experience prior to starting graduate study. Students who expect to complete a program to prepare them for teaching in a community college are expected to have an undergraduate major in a subject area commonly taught in a community college.

Each applicant is considered for acceptance to graduate study on an individual basis with much consideration being given to evidence showing the applicant's commitment to the field of higher education as a career.

Each student works closely with an adviser in program preparation. Each student also has a committee that assists in reviewing the student's progress, in supervising the thesis or research paper, and in administering the final examination. The records of each master's degree student are reviewed periodically by the adviser and committee to determine whether the student should continue in the program.

Program Requirements. Each student will develop, with an adviser, a suitable sequence of courses that will be designed to assist the student in attaining academic and professional objectives.

Community Junior College Teaching (32 semester hours, minimum). Students who wish to teach in a community college must complete at least 20 semester hours in their teaching specialty and at least 12 hours in specified courses in educational administration and higher education, for a minimum of at least 32 semester hours. Students in this program must secure prior to admission a subject matter adviser from the faculty of the subject area who will agree to help plan the student's academic program.

The common core of courses required of students in this program includes the following:
EAHE 516-3 College Students and College Cultures
EAHE 518-3 College Teaching
EAHE 524-3 Curriculum Design and Policy
EAHE 526-3 The Community College

Students must also complete a minimum of 20 semester hours in their teaching specialty. The adviser will often recommend additional courses to assist the student in meeting special requirements. Recommended courses beyond the minimum requirements are:
EAHE 500-3 Educational Research Methods
EAHE 595-2 to 6 Internship
EAHE 592-2 to 3 Special Problems (individual) or
EAHE 599-3 Thesis

College Student Personnel (44 semester hours, minimum). Students planning to enter positions in college student personnel administration must complete a minimum of 44 semester hours of courses with an emphasis in either student development or student affairs administration. Those wishing to complete the counseling emphasis utilizing additional courses in the Department of Educational Psychology should consult the graduate adviser of the College Student Personnel program; this will involve completing a double major in higher education and in educational psychology and will consist of 55 semester hours. It should be noted that students in either the student development or administration emphases are encouraged to include counseling courses as electives.

The common core of courses for this program includes (20 semester hours):
EPSY 402-3 Basic Statistics (a higher level course may be substituted)
EAHE 500-3 Educational Research Methods
EAHE 508-2 Student Development Theories
EAHE 515-3 College Student Development: Operations and Policies
EAHE 516-3 College Students and College Cultures
EAHE 535b-2 Higher Education Seminar I: Law and Higher Education
EAHE 535s-4 Higher Education Seminar I: Professional Seminar in Student Affairs

Additional required courses for specialty in student development:
EAHE 454-3 Contrasting Philosophies of Education
EAHE 510-3 Higher Education in the United States
EAHE 535a-1 Higher Education Seminar I: Group Work
EAHE 595-3 Internship (with emphasis in student development)
EAHE 592-3 Special Problems (individual) or
EAHE 599-3 Thesis (with emphasis in student development)
11 hours of electives

Additional required courses for specialty in administration:
C&I 585r-3 CBI-Computer Forecasting in Education

EAHE 513-3 Organization and Administration in Higher Education
EAHE 535N-1 Higher Education Seminar I: Supervisory Management
EAHE 595-3 Internship (with emphasis in administration)
EAHE 592-3 Special Problems (individual) or
EAHE 599-3 Thesis (with emphasis in administration)
11 hours of electives

Students are encouraged to develop flexible programs preparing them in general student affairs administration or in one or more of a particular student service (i.e., student center, housing, international services, activities, financial assistance, or alumni affairs). Students are advised to be familiar with the national preparation standards approved by the Council for the Advancement of Standards (CAS). In addition, each student must complete a paid internship experience (usually a graduate assistantship). It is recommended that the required credit internship experience be in a setting other than where the paid internship is completed.

Organization and Administration (32 semester hours, minimum). Students planning to prepare for careers in academic administration (i.e., academic advising, administrative secretary to an academic administrator); in fiscal affairs administration (i.e., bursar, housing, business officer, student center financial officer, college purchasing agent); or in general program administration (i.e., administration of research, institutional studies, auxiliary enterprises) must complete a program of at least 32 semester hours. The common core of this program includes:
EAHE 500-3 Educational Research Methods
EAHE 510-3 Higher Education in the United States
EAHE 513-3 Organization and Administration in Higher Education
EAHE 516-3 College Students and College Cultures
EAHE 518-3 College Teaching
EAHE 595-2 Internship (unless specifically waived because of previous suitable work experience)

Students pursuing this program emphasis should enroll for courses and seminars to strengthen their general background and specific skills in keeping with their vocational goals. These will include at least 2 hours from one or more of the following courses (which are frequently scheduled as two-hour seminars):
EAHE 535e Higher Education Seminar I: Academic Advisement
EAHE 545e Higher Education Seminar II: Problems of Central Administration
EAHE 545f Higher Education Seminar II: Business and Fiscal Affairs
EAHE 535b Higher Education Seminar I: Law and Higher Education

Research Requirements (for all master's degree specializations within higher education). Each student shall demonstrate research competencies through writing an acceptable research paper or master's thesis. Students who select the thesis option must have an approved prospectus on file at least 6 months in advance of the anticipated graduation date; they must enroll for 3 hours of EAHE 599, Thesis; and they must have a committee of at least 3 members. Students who elect to write a research paper are not required to register for any credit courses; they may, however, elect to enroll for 3 semester hours of EAHE 592, Special Problems (individual) for this important activity.

Students in the community junior college teaching emphasis must submit an acceptable research paper on a topic in their subject matter (teaching) field with final approval coming from both the adviser in the Department of Educational Administration and Higher Education and the representative of the subject area department who agrees to work with the student in writing the paper. In exceptional cases, the paper may be in higher education instead of the subject matter field.

Students in the college student personnel program usually prepare research papers on a topic concerned with student development and related activities. However, they do have the option of writing a thesis.

Students in organization and administration may write a research paper or a thesis to demonstrate their research competencies.

Final Examination and Grade Requirements. All master's degree students are required to complete successfully a final examination which may be written or oral or both. They must complete at least 21 semester hours of graduate credit with grades of *A, B,* or *C* in courses graded *A* through *F.* Upon successful completion of all requirements, including at least a *B* average for all course work, the student is recommended to the Graduate School for graduation.

Doctor of Philosophy Degree in Education with a Concentration in Higher Education

The Department of Educational Administration and Higher Education participates in the doctoral degree program in education with a concentration in higher education.

Admission and Retention. Each applicant is evaluated on an individual basis with much consideration being given to evidence of the applicant's commitment to higher education as a field of study and as a career. Each applicant should plan to visit the campus and interview members of the faculty related directly to the higher education doctoral program. Each application is evaluated and acted upon by the higher education faculty and by the admission committee of the Department of Educational Administration and Higher Education.

Each student selects a doctoral committee in keeping with the regulations set for the Doctor of Philosophy degree in education. This committee of 5 members assists the students in selecting a plan of study which meets the minimal requirements of the degree and of the program. Requirements beyond the minimum may be established by the student's doctoral committee.

The records of each doctoral student are reviewed annually by the student's doctoral committee to determine whether the student should continue in the program.

Program Emphasis and Requirements. Earning the doctorate is not dependent merely upon the completion of a specific set of courses. Rather, the completion of the Doctor of Philosophy degree is based upon the competence of the student relating to the basic writings in the field and upon the student successfully completing an original research study of merit. Each student, in collaboration with and concurred by the doctoral committee, determines the program of courses, which may include work from other departments. An internship may be required if the applicant has not had previous professional experience in higher education.

The basic core courses for the degree include:
EDUC 590-4 Doctoral Seminar in the Cultural Foundations of Education
EDUC 591-4 Doctoral Seminar in the Behavioral Foundations of Education
Higher Education Core-16 hours
EAHE 510-3 Higher Education in the United States
EAHE 518-3 College Teaching
EAHE 550-2 Higher Education Seminar III (Capstone)
EAHE 589-2 Higher Education Research Seminar
Two courses chosen from the following 5 courses:
EAHE 513-3 Organization and Administration of Higher Education
EAHE 516-3 College Students and College Cultures
EAHE 524-3 Curriculum Design and Policy

EAHE 528-3 Finance in Higher Education
EAHE 554-3 Seminar in Philosophy of Education

In addition, students, in consultation with their doctoral committees, select a program emphasis including a minimum of 16 semester hours beyond the higher education core. Each doctoral student must complete at least 40 semester hours of course work beyond the master's degree plus 24 semester hours of dissertation.

Research Requirement. The Ph.D. degree in education is a research-oriented degree. The student must demonstrate competency in one or more research tools selected in collaboration with and approval by the doctoral committee in keeping with the guidelines for the Ph.D. degree in education. The research tools should be related to the type of dissertation that is to be submitted and must meet the guidelines outlined in the Ph.D. policies and procedures manual for administering the Doctor of Philosophy degree in education. If the research tool requirement is met by one or more credit courses, such work is above the 64 hours of course work noted above.

Preliminary Examination. The preliminary examination in higher education is a comprehensive written examination prepared each semester by a special examination committee of the graduate faculty members of the higher education program. The student may also be asked to complete successfully an oral examination. Students may petition their doctoral chair to take the examination when they have successfully completed the research competency requirements, the doctoral seminars, and all or most of the course work listed on the approved program. This petition must be submitted during the first week of the semester or summer session in which the student plans to take the examination. A person can be advanced to candidacy for the degree only upon successful completion of this examination and the completion of most of the course work (including courses in which the grade of *Inc* was originally given), the research tools, and the residency requirement. Students are allowed 3 chances to pass the preliminary examination.

Dissertation. The dissertation is the scholarly study of an appropriate research problem approved by the student's doctoral committee. A minimum of 24 semester hours of dissertation credit is required. The committee is composed of at least 5 faculty who have graduate faculty status. The chair and 2 other members of the committee must be members of the Department of Educational Administration and Higher Education; at least 1 other member of the committee must be from the College of Education in a department other than educational administration and higher education; and at least 1 other member from an academic unit outside the College of Education.

The student must pass a final oral examination, at which time the dissertation is defended. Final approval of the dissertation must be granted by the doctoral committee, and 2 unbound copies of the dissertation must be filed with the Graduate School. At least 1 bound copy must also be filed with the Department of Educational Administration and Higher Education.

History

The Department of History offers graduate programs leading to the Master of Arts and Doctor of Philosophy degrees.

Research Facilities

Morris Library on the campus is the fourth largest library in Illinois. Housed in a modern seven-story building, it contains 2 million volumes and is growing at a rate of over 60,000 items per year. Morris Library acquires current scholarly publications not only from United States but also from Latin America and European publishers. The long-term use of highly specialized materials is afforded by the affiliation of Morris Library with the Center for Research Libraries in Chicago.

The holdings in history and related areas amount to more than 500,000 volumes. To these must be added 20,000 reels of microfilm containing printed secondary works and 6,000 volumes of printed source material and 30,000 volumes of early American imprints prior to 1800 on microtext. Among the materials in the process of acquisition is a microtext edition of all newspapers published in the United States prior to 1820.

The library also possesses substantial holdings in the form of microfilm editions of presidential papers, dispatches and instructions of the state department since 1789, massive holdings in consular records, and the Adams family papers. The library has been a complete repository of United States government documents since 1954 and holds a large collection of earlier documents, including a virtually complete Congressional set. With the publication of the Ulysses S. Grant papers by the Southern Illinois University Press and the location of the Grant Association on the campus, the library is acquiring what will become the country's leading collection of Grant books and correspondence.

Following the acquisition of the 7,000-volume library of Jose Morgrovejo Carrion of Ecuador in 1960, the library has systematically expanded its holdings in Latin American history, government, literature, and anthropology. The papers of Vasquez Gomez, Mexican vice-president (1907–1919), and Samuel Putnam, American expert on Latin American affairs, provide rich research opportunities. Extensive files of serial publications from Argentina, Bolivia, Paraguay, Uruguay, Cuba, and Mexico also contain diverse sources for investigation. Many of the above materials are unavailable elsewhere in the United States.

Holdings in European history include the standard documentary publications, as well as scholarly serials and journals. The materials to support research are strongest in modern German and English history.

Admission

Graduate work in history is offered at both the master's and the doctoral levels. Admission to programs administered by the Department of History must be approved by the department, with approval dependent upon the preparation, ability, and promise of the individual student.

M.A.: for the Master of Arts degree major in history, the department's admission requirements are those of the Graduate School, except that students admitted with a GPA of less than 2.7 must establish a 3.00 GPA in history courses in the first semester. The department reserves the right to terminate from the history program a student who does not establish and maintain a 3.00 GPA in history courses.

Ph.D: for admission to the doctoral program, each applicant should submit to the department, in addition to the material required by the Graduate School, the following: three letters from former teachers, preferably at the graduate level; a letter in which the applicant expresses professional and personal objectives; and a report of the result of the aptitude test (both verbal quantitative) and of the Graduate Record Examination.

Requirements for the Master of Arts Degree

Two programs of study lead to the M.A. degree in history: the thesis and two-field options. The thesis option requires a thesis which demonstrates the candidate's capacity to carry out independent and original research. A candidate in the thesis program should, with the approval of the chair, select a thesis adviser and a thesis topic by the end of the first full-time semester in the program. As many as six semester hours may be taken in thesis research.

A candidate must submit an acceptable thesis and pass a comprehensive oral examination covering the selected field of concentration and the candidate in the thesis program must take at least one research seminar in which a paper will be written.

A candidate in the two-field program must complete two research papers with a grade of *A* or *B*. These papers are normally to be prepared in the department's regularly scheduled research seminars. A copy of one paper must be filed with the Graduate School; copies of both papers must be filed with the department. Each candidate is required to pass a comprehensive written examination conducted by a committee consisting of three persons. The examination will cover two fields chosen in consultation with the candidate's committee from the following list.

United States to 1877
United States, 1865 to present
Latin America, Colonial
Latin America, independent
Europe, Mediaeval
Europe, early modern
Europe, modern
England, modern
East Asia

History may be chosen as a minor when a student's program of study allows for a graduate minor or as a teaching specialty for the Master of Science in Education degree major with a major in secondary education or higher education.

Students enrolled in the Master of Arts degree program must consult with the graduate adviser in the Department of History before registering for courses. Students enrolled in either of the Master of Science in Education degree programs must consult the history graduate adviser and the appropriate department in the College of Education before registration.

For the Master of Arts degree major in history, 30 semester hours of satisfactory graduate work are required; at least 18 of these 30 hours must be on the 500 level. Within this general requirement, at least 20 semester hours must be in appropriate history courses, with at least 10 of the 20 hours on the 500 level. The remainder of the hours may be taken in courses on the 400 level. The M.A. degree student must take at least two research seminars in history.

All candidates for the Master of Arts degree must satisfy the requirement for a research tool by demonstrating proficiency in a foreign language or in quantitative methods (statistics, computer programming, or data management).

The language research tool option may be fulfilled either by passing Foreign Language 488 with a grade of *A* or *B,* or by achieving a satisfactory score on the Graduate School foreign language test, or by special testing arrangements made between the student, the graduate adviser, and the student's adviser.

Graduate students may demonstrate proficiency in quantitative methods by passing two courses with a grade of *A* or *B,* from among the following: CS 202; EPSY 506 and 507; POLS 503b; MATH 514, 515, and 516A and B. The courses selected will be determined in consultation among the student, the student's adviser, and the graduate adviser. With the consent of the graduate adviser, other courses in statistics and computer science may be accepted in fulfillment of the research tool requirement. None of the courses used to satisfy the research tool requirement may be counted as part of the thirty semester hours of graduate work required for a master's degree.

The Doctor of Philosophy Degree

A student seeking the Ph.D. degree in historical studies must pass preliminary examinations and submit a satisfactory dissertation which involves independent and original research. In preparing for preliminary examinations, a doctoral student must complete at least 24 hours of credit on campus within a period not to exceed four calendar years before being admitted to candidacy. The courses and hours of credit necessary for a doctoral student to prepare for preliminary examinations will be determined by the student's advisory committee and must include successful completion of four research seminars with grades of *A* or *B*. The goal is to develop high competence in the selected fields in which the student will be examined. Students are responsible for preparing five fields, one of which may be outside the field of history. Three of the five fields will be in the broad areas of United States, European, Latin American, or Asian history encompassing major historical periods; two of the fields will emphasize depth of preparation rather than breadth and will normally involve shorter time periods or topical specialties. A list of Ph.D. degree fields reflecting the current expertise of the faculty and approved by the department's graduate studies committee will be kept on file in the office of the graduate adviser and the department chair. Examinations will cover four fields and the student can be certified as proficient in the fifth field, providing that all courses taken in preparation for that field are passed with grades of *A* or *B*. Full-time Ph.D. students who have not passed their preliminary examinations must take, in each semester, at least six semester hours of graded courses, at least three of which must be on the 500 level. Dissertation hours may be taken prior to admission to candidacy only with the approval of the graduate studies committee.

The department requires all candidates to pass a reading examination in two foreign languages. With the approval of the department, quantitative methods, (statistics, computer programming, or data management) may be substituted for one language. Procedures for demonstrating proficiency in foreign language or quantitive methods are the same as those required for the Master of Arts degree. These requirements must be satisfied prior to the preliminary examinations.

After completing the course work, fulfilling the foreign language requirements, and passing the preliminary examinations, the student will be recommended for Ph.D. candidacy and will devote full time to the dissertation. Dissertation subjects must be chosen from either United States history, Latin American history, or European history. The final oral examination will cover the field of the dissertation and related matters.

Assistantships and Fellowships

Fellowships and teaching assistantships are available to qualified graduate students. All carry stipends and remission of tuition. Application for these awards should be submitted by February 1.

Additional information concerning the graduate program in history may be obtained by writing to the chair, Department of History.

Journalism

The considerable growth of the mass communication industries has caused an increased need for professionally educated men and women with graduate degrees who want to pursue careers as journalists in the mass media, communication specialists in industry and government, researchers, teachers, and university faculty members.

Graduate programs in the School of Journalism are designed to help students achieve significant intellectual growth as they prepare for these careers. It is in-

tended that the student's entire graduate program be a challenging, stimulating, and valuable educational experience. For this reason, the School of Journalism has 3 degrees, each offering a different approach to graduate education. In each degree program, students take some of their work in departments other than journalism so that they may explore areas of interest to them and inquire into other disciplines.

The School of Journalism offers graduate programs leading to the Master of Arts, the Master of Science, and the Doctor of Philosophy degrees with a major in journalism. Available areas of emphasis are: social and behavioral approaches to communication processes and effects; media history; and legal studies in mass communication. The Master of Arts and Ph.D. degrees are research degrees culminating in the preparation of a thesis or dissertation. Students are expected to conduct research to provide answers to important questions, to discover new information, to show new associations between previously known facts, or to supply historical or legal information about particular subjects.

The Master of Science degree is a media-oriented degree designed to be of benefit to individuals who wish to prepare themselves to be more proficient in their professions and does not necessarily involve the kind of research required in preparing a thesis.

Admission to the Degree Program

Persons seeking admission should consult the appropriate section of the Graduate Catalog. GRE or GMAT Aptitude Test scores must be submitted before a student enters the program. Students without a previous journalism or mass communication degree or professional media background are usually required to take some undergraduate courses without credit as a way of gaining background. The amount of this course work will be determined by an adviser in consultation with other faculty members. A TOEFL score of 600 or higher is required of all foreign students, except those from English-speaking countries. A minimum undergraduate GPA of 3.0 is required for acceptance into the graduate program.

Academic Retention

In addition to the retention policies of the Graduate School, the School of Journalism requires that each master's degree student must maintain an overall grade point average of 3.00 ($A = 4$) and each Ph.D. student must maintain an overall grade point average of 3.25 ($A = 4$). Upon falling below this average, students will be allowed one academic term to bring their averages up to the minimum; failing this they will be dropped from the program and will not be allowed to re-apply. No course in which the grade is below *C* shall count toward the degree nor fulfillment of any requirement, but the grade will be included in the grade point average. No more than 3 hours of *C* work in graduate courses will count toward either degree.

All students are subject to regular review by the School of Journalism graduate faculty. Those not attaining the minimum acceptable standards or who in any way fail to meet any other requirements or standards set by the faculty will be dropped as majors. Doctoral students may be required to take extra work if any grades of *C* or lower are earned at SIUC. Students on academic probation are not eligible to hold graduate assistantships.

Master of Arts Degree

The Master of Arts degree student usually builds on a base of social science and a study of journalism or mass communication leading to a career in teaching, scholarship, or applied research in advertising, public relations, media management, opinion research, or similar areas. The degree also may lead to Ph.D. studies.

Candidates for the M.A. degree must complete a minimum of 30 semester hours of graduate work, including 3 hours for the thesis. Additional courses may be required if students change their areas of interest or if performance in course work indicates the need for more course work. No fewer than 18 nor more than 21 semester hours of course work must be earned in journalism. Remaining course credits should be taken in departments whose disciplines have strong theoretical bases. Courses in some departments may not, therefore, be used to meet requirements. Students often elect courses in history, psychology, political science, sociology, anthropology, economics, and guidance.

Each student is required to prepare, write, and defend a thesis which demonstrates a capacity for investigation and independent thought. Students must be enrolled for thesis credit during the semester they defend their theses.

Failure to present and defend an acceptable thesis proposal, or failure to maintain continuous progress toward completion of degree requirements serve as reasons for dismissing a student from the program. Additional work may be required of those students whose progress is interrupted.

Master of Science Degree

The Master of Science degree program with a major in journalism provides advanced professional training for careers in the mass media and related areas. Persons with graduate degrees from accredited schools of journalism are in demand by newspapers, magazines, broadcasting, advertising and public relations firms, government, and industry. The growing complexity of communication increases the need for persons sensitive to the intricacies of communicating via the mass media.

The Master of Science degree work consists of 2 separate programs. They are broadly based and draw upon the resources of a diverse and knowledgeable journalism faculty and upon many other academic areas in the University. From such resources, the School of Journalism provides individually developed programs for graduate students aiming at such careers as newspaper reporting, radio and television news, advertising, public relations, magazine editing, media management, and teaching.

PROGRAM A

Thirty semester hours are required for the Master of Science degree in program A, including 3 hours for thesis or professional project, whichever the student chooses. From 15 to 21 semester hours of course work must be earned in journalism including one research course. Remaining semester hours should be taken in a discipline or disciplines appropriate to the student's area of study. Students must successfully complete 6 hours of written master's comprehensive examinations and a two-hour oral. Formal, oral defense both of the thesis or project proposal and of the completed thesis or project is required.

PROGRAM B

Program B requires 36 semester hours of course work, but the student writes a research paper instead of a thesis or master's project. The research paper is normally an extension of the requirements for a specific course of the student's choosing. From 15 to 21 hours of course work must be earned in journalism including one research course. Remaining semester hours should be taken in a discipline or disciplines appropriate to the student's area of study. Students must successfully complete 6 hours of written master's comprehensive examinations and a two-hour oral.

Doctor of Philosophy Degree

The Ph.D. degree program is designed to produce scholars and teachers who can make significant contributions to the understanding and development of the

mass media and their utilization. Doctoral studies include the entire process of mass communication, including communication theory, media history, mass media law, and mass media institutions and their interrelationships with other societal institutions. The program asks students to achieve breadth in their studies, but allows each student to develop a special area of interest and research.

Normally, 3 years of concentrated study, including preparation of a dissertation, will be required to earn the degree, which is built on the base of a suitable master's degree program.

Minimum course requirements for the Ph.D. degree include 38-40 semester hours beyond the master's degree, including basic foundations in mass communication theory and research methods (JRNL 500 and 504). In addition, programs of study will include 2 appropriate research tools, as described below. All doctoral students must complete a graduate course in media law and a graduate inferential statistics course (GUID 506). An evaluation of previous work is made and transfer credit is allowed only for work which fits the degree plan. Approximately two-thirds of course credit hours will be earned in journalism and mass communication; the remaining hours will be earned in a nonjournalism area of study, which might include work in more than one department. Additional course work may be required if the student's area of interest changes or if performance in courses or comprehensive examination results indicate the need.

During the second semester of enrollment, each Ph.D. student will prepare a total program plan for the degree and secure sponsorship by a dissertation committee chair. The plan should include a list of courses and tools, with some explanation and justification for their selection in relation to academic goals. The plan will be discussed and modified, when appropriate, before approval. Once approved, the plan may be changed only with permission of the adviser. The student may deviate from the 2/3-1/3 pattern if the resulting program contains work leading to appropriate research or professional career goals.

Tool Requirements. Minimum course requirements listed above do not include courses taken to satisfy tool requirements. The Ph.D. student, in consultation with the adviser, will select 2 useful tools from among:

Research Design—JRNL 501
Historiography—JRNL 530
Legal Research—JRNL 540
Statistics—GUID 506 and 507
Computer Science—Courses to be selected
Modern Foreign Language—Standard Proficiency Examination

Courses listed as tools are subject to change without notice at times when departments change course content, titles, or numbers. Only grades *A* or *B* are accepted for tool courses.

A student may propose other research tools for consideration by the School of Journalism, but such tools must be useful in the conduct of research, especially for the doctoral dissertation.

Examinations. Each student must pass rigorous comprehensive written and oral examinations after completing tool requirements and all course work (with all incomplete and deferred grades removed). The examination must be completed within one year after the student has satisfied all course and tool requirements. Failure to successfully complete the exams during the one-year period will result in dismissal from the program. While the form and scope of the examinations are at the discretion of the graduate faculty members of the School of Journalism, within basic parameters, the examinations comprehensively test the student's understanding of communication and communication research. Each student takes a minimum of 20 hours of exams including an outside area.

Students prepare dissertation proposals, defend and explain the proposals before their committees and complete the research and write their dissertations. Within one year after admission to candidacy, students must have written dissertation proposals approved by their committees. Dissertations must be based on scholarly research and independent thought.

Students must enroll for a minimum of 24 hours in JRNL 600. Each student must enroll in JRNL 600 each term between admission to candidacy and completion of all requirements for the Ph.D. degree.

Graduate students who have completed their course work and the minimum number of credits required for thesis or dissertation must enroll in JRNL 601, Continuing Research, each semester until the completion of their degree programs.

The dissertation defense will be before members of the dissertation committee (all of whom must be present) and interested observers. Although others than committee members may ask questions of the student, the pass or fail decision on the oral will be made by committee members only.

Linguistics

The goal of the Department of Linguistics is to bring students to an understanding of language systems which is both theoretical and practical. For students committed to the study of language, the department offers 2 M.A. degree programs: the M.A. degree in English as a foreign language and the M.A. degree in applied linguistics. Students whose career goals are to enter the large and increasing job market of teaching English as a foreign/second language, to help train other teachers, and to develop curricula and teaching materials may select either the one-year (i.e., three-semester) program in English as a foreign/second language or the two-year program in applied linguistics with a concentration in teaching English as a second or foreign language. This second option is for those interested in a more detailed study of the issues, theories, and concepts involved in linguistics and second language acquisition. In this two-year program students are exposed to current research through seminars and other advanced courses and through the writing of a thesis in an area related to second language teaching and learning.

The other options offered in the M.A. degree in applied linguistics are in these concentrations: phonetics/phonology, syntax/semantics, psycholinguistics, and linguistic variation (historical or sociolinguistics). These options include all the content of a traditional program in theoretical linguistics as well as an applied linguistics focus. For students who are interested in language study but not committed to either of our graduate majors, the department offers a number of interesting, non-specialist courses which may serve as electives in related degree programs, such as communication disorders and sciences, psychology, English, foreign languages, speech communication, and anthropology. A sequence of courses is also available for those wishing to pursue a double major combining English as a foreign language or applied linguistics with other programs at the master's level. Applicants for admission should send inquiries to the chair, Department of Linguistics, Southern Illinois University at Carbondale, Carbondale, IL 62901.

Admissions

Applicants for admission to either degree program, in addition to meeting the general conditions for admission to the Graduate School, are expected to have undergraduate GPA's of at least 3.0 (A = 4.0). Applicants with GPA's below 3.0 may be granted conditional admission. (Students admitted on a conditional basis must earn a graduate GPA of 3.0 after the first 10 hours of letter-graded course

work taken in their program; failure to do so will result in the student's being dropped from the program.) In addition, applicants who are not native speakers of English must have a TOEFL score of at least 570. Although submission of GRE scores is not required for admission to the Graduate School or to the department, applicants are advised that high GRE scores can be helpful in competition for University fellowships or departmental assistantships. Lacking an undergraduate major in linguistics or English as a foreign language, applicants are advised that preparation in related fields is desirable.

All students entering either the M.A. degree in applied linguistics or the M.A. degree in English as a foreign language programs must demonstrate a minimum level of knowledge of traditional English grammar. This is tested by a departmental diagnostic examination administered to all students at the beginning of their first term. Students not able to pass the test will be required to take an undergraduate course in English grammar and pass the course with a grade of *B* or better. This course cannot count toward a graduate degree in EFL or applied linguistics.

Applicants for admission must also demonstrate spoken and written proficiency in English, which is measured by departmental diagnostic examinations given upon the student's arrival. Students not able to pass these tests must take suitable remedial work provided for by the department.

Retention

Students admitted on a conditional basis must earn a graduate GPA of 3.0 after the first 10 hours of letter-graded course work taken in their programs; failure to do so will result in the student's being dropped from the program.

If, after one term on academic probation, as defined either by the Graduate School or herein, any students who fail to return to good standing will not be entitled to financial assistance from the department. If, after 2 terms on academic probation, they fail to return to good standing, they will be dropped from the program.

When students accumulate 3 or more incompletes, they will be put on academic probation and will return to good standing by reducing the number of incompletes to 2 or less. While on academic probation the student is subject to the above stipulations for financial assistance and for being dropped from the program.

The core courses (LING 401, 402a, and 570), as required by a student's particular program, must be passed with a grade of at least *B*. These courses may be repeated once in order to fulfill that requirement.

Comprehensive Examination

Toward the end of their course work, students must take and pass a written examination covering the areas of their concentration. This examination may not be taken more than twice. In order to be eligible to take the examination, department students must have at least a 3.0 GPA when the examination is given, and must have passed the test of traditional English grammar. Students having a GPA just below 3.0 may petition the department's executive committee to be considered for a special waiver of the requirement. However, petitioning the committee does not automatically result in a waiver.

Minimum Grades in Core Courses

All students in the M.A. degree in an EFL program must receive a minimum grade of *B* or better in the following core courses: LING 401, LING 402a, and LING 570. All students in the M.A. degree in applied linguistics program must receive a minimum grade of *B* or better in the following core courses: LING 401 and LING 402a. This regulation also applies to students in either program who took the courses in question as undergraduate students.

Students who receive a grade lower than *B* must take the course again. They will register officially for the course; this requires a letter of permission from the department. Both grades will be counted in the student's GPA.

The courses in question must be completed with a minimum grade of *B* before the student takes the comprehensive examinations. Students repeating the course during the term in which they wish to take the comprehensive examinations must have a letter from the course teacher indicating that they have a current grade standing of at least a *B*.

Students who are repeating any of these courses may take courses concurrently or sequentially for which these courses are prerequisites before getting an acceptable grade.

Grade Point Average to Graduate

All graduate work must be completed with an overall GPA of 3.0.

Master of Arts Degree in English as a Foreign Language

Applicants for admission to the English as a foreign language program who are not native speakers of English should have an undergraduate concentration in English language or literature, or the equivalent in practical experience.

The EFL program at SIUC is uniquely different from many such programs in the way it blends theory and practical matters; it prepares students intellectually as well as experientially, so that they will be capable not only of conducting a class in English, but of making the decisions necessary for choosing among competing approaches, conflicting situations, and unforeseen activities. The methodology courses of the EFL program provide a blend of theory and practice in the study of EFL/ESL. Thus, graduates of this program are prepared to participate in teacher-training as well as to be classroom teachers.

As a vital part of the graduate training program in EFL, all students in that program are required to engage in practice teaching assignments through enrollment in LING 581 (practicum in EFL/ESL: oral English) and LING 585 (practicum in EFL/ESL: written English). Waivers may be given according to departmental guidelines. These courses are designed to enable the student to carry out practice teaching responsibilities in the LING 100 (oral English), LING 101, 105, 290 (composition for foreign students), classes in oral or written English at CESL, tutorial work in the English remedial workshop, (i.e., the writing clinic or developmental skills), or other appropriate courses. The purpose of these practice courses and practice teaching assignments is to expose students to some of the types of teaching activities they will ultimately be engaged in after they receive their degrees.

The total credit hour requirement is a minimum of 32 credit hours. A minimum of 15 of these hours must be at the 500 level.

Required Courses (16 semester hours)

LING 401-4 General Linguistics
LING 402a-3 Articulatory Phonetics
LING 570-4 Theory and Methods of EFL/ESL
LING 581-2 Practicum in EFL/ESL: Oral English
LING 585-3 Practicum in EFL/ESL: Written English

The remaining 16 semester hours in the M.A. degree in an EFL program are to be selected from 2 groups of courses within the departmental offerings. Occasionally courses from related departments are used to complete elective requirements where such courses are appropriate to the student's area of specialization.

All EFL students who are native speakers of English must have the equivalent of 1 semester of study of a modern language (including exotic language) within the preceding 5 years (excluding high school). This study may have been

academic or direct experience (living in another country) with formal study (e.g., Peace Corps classes, FSI, Army language schools). In default of such background, the student must register for at least one semester of study of a modern language at SIUC. Enrollment in an undergraduate level course for credit or for audit satisfies the requirement. Students who are not native speakers of English, in recognition of their experience in learning English, are exempted from this requirement.

A thesis is not required for the M.A. degree in English as a foreign language; however, a candidate for this degree may optionally choose to write a thesis. In that case, the thesis policy and guidelines for the M.A. degree in applied linguistics apply. A research report is required in lieu of a thesis. The research report may have been prepared as a term paper for any advanced course, must have earned an *A* or *B,* must give evidence of the candidate's ability to do research reporting, and must be in acceptable form. In addition to the copy required by the Graduate School, the student must submit a copy to the department.

A certificate of attendance may be granted to those students who do not satisfy the graduation GPA requirement (3.0), the comprehensive examination requirement, the English language proficiency requirement, or the traditional English grammar proficiency requirement.

Master of Arts Degree in Applied Linguistics

The Master of Arts degree with a major in applied linguistics encompasses a broad range of core courses in linguistics plus an in-depth sequence of courses in 1 of 5 concentrations chosen by the student: TEFL/TESL, phonology, syntax/semantics, psycholinguistics, or linguistic variation. A minimum of 45 credit hours is required for the applied linguistics concentration; at least 15 of these must be at the 500 level.

Core Requirements (22–25 credit hours).
LING 401-4 General Linguistics
LING 402a-3 Phonetics
LING 406-3 Introduction to Historical Linguistics (optional for TEFL/TESL concentration)
LING 405-4 Phonological Theories
LING 408-4 Syntactic Theory
LING 415-3 Sociolinguistics
LING 445-4 Introduction to Psycholinguistics

In each concentration students are required to take 3–7 additional credit hours beyond these core requirements. The 3-7 hours vary according to the concentration. Among the requirements and electives are the following:
TEFL/TESL: Theory and Methods in EFL/ESL, Innovative Methods, Notional/Functional Syllabus, Language Testing, Materials Preparation.
Phonology: Phonology Seminar, Acoustic Phonetics, Contrastive Linguistics, English Phonology.
Syntax/Semantics: Syntax Seminar, Language Families, Structure of the English Verb, Stylistics.
Psycholinguistics: Second Language Acquisition, Psycholinguistics Seminar, Language and Cognition, Developmental Psychology.
Linguistic variation: Historical Linguistics, Sociolinguistics Seminar, Dialectology, Language Planning, Pidgins and Creoles.

Electives may be selected from courses offered within the department, or from appropriate offerings from other units (e.g., anthropology, communication disorders and sciences, computer science, education, English, foreign languages and literatures, philosophy, and speech communication psychology). Where appropriate, students are encouraged to include courses in research methodology,

statistics, and other empirical research techniques. Students are encouraged to attend summer institutes sponsored by the Linguistic Society of America or the international TESOL organization; credit will be allowed for course work successfully completed.

A thesis is required for the M.A. degree with a major in applied linguistics. Work on the required thesis may be counted for from 3 to 6 credit hours in this degree program. The student, in consultation with a graduate adviser, shall propose a topic and a thesis committee consisting of a chair and 2 other faculty members to serve as the thesis committee; the executive committee of the department must approve the topic and structure of the thesis committee. The chair is to be a member of the graduate faculty of the Department of Linguistics. One or both of the other committee members may be from outside the department. In addition to the 2 copies required by the Graduate School and any requested by committee members, the student must submit a copy of the thesis to the department.

Candidates for this M.A. degree must have current proficiency in a language other than English; this may be native proficiency or the equivalent of the proficiency expected after 3 academic years of course work. Such proficiency is demonstrated by obtaining at least a grade of *B* in the appropriate FL 488b course or by obtaining a score of at least 500 on any option of the Graduate School Foreign Language Test given by the Educational Testing Service.

Manufacturing Systems

Master of Science Degree in Manufacturing Systems

Graduate work leading to the Master of Science degree in manufacturing systems is offered by the College of Engineering and Technology. The objective of the program is to develop manufacturing professionals who can design and implement modern manufacturing systems to increase productivity and improve product quality. Course offerings and research are available in manufacturing processes and control, quality control, and computer applications. The program provides advanced education for students with baccalaureate degrees in technology and also an excellent continuing education opportunity for individuals with technical degrees who wish to expand their education in the area of manufacturing systems.

Admission

Candidates for this program must be accepted by the Graduate School and the Department of Technology. Candidates should possess a bachelor's degree with a major in a technical area and have a GPA of no less than 3.0/4.0. A student whose undergraduate training is deficient may be required to take additional courses to compensate for deficiencies identified by the technology graduate program committee.

Program Requirements

The program in the thesis option requires a minimum of 30 semester hours of acceptable graduate credit, 18 semester hours of which is in manufacturing systems.

Students will complete a master's thesis, having 6 semester hours of credit, and be required to pass a comprehensive examination covering all of the student's graduate work and thesis.

Within the 30 semester hour requirement, students must complete the following core courses or their equivalents:
MATH 458-3 Statistical Methods in Business

MFGS 510-3 Recent Advances in Quality Assurance
MFGS 520-3 Computer-Aided Manufacturing II
MFGS 540-3 Product Reliability Theory
MFGS 560-3 Automated Factory Technology

A program of study including the above required courses (15 semester hours), the master's thesis (6 semester hours), and the remaining 9 semester hours will be selected by the graduate adviser and the student.

If a student prefers the non-thesis option, a minimum of 36 semester hours of acceptable graduate credit including the 15 semester hours of core courses is required. The student is expected to take at least 21 semester hours within the major department including no more than 3 semester hours of MFGS 592 to be devoted to the preparation of a research paper. In addition, each candidate is required to pass a written comprehensive examination.

Each student will select a minimum of 3 technology graduate faculty members to serve as a graduate committee, subject to approval of the director of the graduate program. The committee will:

1. approve the student's program of study,
2. approve the student's research paper topic,
3. approve the completed research paper, and
4. administer and approve the written comprehensive examination.

Additional Information

Teaching or research assistantships and fellowships are available for qualified applicants. Additional information about programs, courses, assistantships, and fellowships may be obtained from the College of Engineering and Technology or from the chair of the department.

Mathematics

Graduate work in mathematics is offered leading to the Master of Science, Master of Arts, and Doctor of Philosophy degrees in mathematics and the Master of Science degree in statistics. Students interested in the teaching of mathematics may select a minor concentration in education within the Master of Science degree in mathematics. Minor work for graduate degrees in other fields, which allow for a minor, is also offered.

Acceptance for graduate study in mathematics and subsequent continuation in the graduate program are at the discretion of the Department of Mathematics, provided that the student has been admitted to the Graduate School and meets the retention standards of the Graduate School. In addition to general rules, regulations, and requirements of the Graduate School, the following specific requirements pertain to the degrees available in mathematics.

Master of Science Degree in Mathematics

Students will be considered for acceptance into the M.S. degree in mathematics program if they have completed an undergraduate major in mathematics or a strong undergraduate minor in mathematics together with a major in a closely related discipline.

Once accepted, the requirements are as follows:

1. The candidate must complete a total of at least 30 semester hours of graduate credit approved by the graduate advisor of which 15 hours must be at the 500 level and at least 21 hours must be in courses (exclusive of 400, 417, 458, 511, 592) offered by the Department of Mathematics. A minor concentration may be taken outside of the department if approved by the graduate adviser during the student's first semester in the master's program.

2. The candidate's program must include at least one 400- or 500-level course from each of 4 of the following areas: (1) pure and applied algebra; (2) pure analysis; (3) applied analysis; (4) geometry and topology; (5) probability and statistics. This requirement may be met in whole or in part by means of equivalent courses taken elsewhere prior to acceptance for graduate study in the department.
3. The candidate must prepare a research paper or thesis (3 hours credit in MATH 595 or 599) under the supervision of a research adviser and two other faculty members from the department. This committee will be appointed by the graduate adviser after consultation with all those involved.
4. The candidate must demonstrate satisfactory performance on a final oral examination covering the graduate course work and the research paper or thesis. This examination will be conducted by the 3 members of the candidate's committee and moderated by the research adviser. The student will pass the examination if the research adviser and at least 1 of the other 2 committee members so agree.

Master of Science Degree in Statistics

Students will be considered for acceptance into the M.S. degree in statistics program if they have completed an undergraduate major in either statistics or mathematics or a strong undergraduate minor in mathematics together with a major in a closely related discipline.

Once accepted, the requirements are as follows:

1. The candidate must complete a total of at least 30 semester hours of graduate credit of which at least 15 must be af the 500 level, at least 21 must be in courses (exclusive of 400, 417, 458, 511, 592) offered by the Department of Mathematics, and at least 6 in an approved minor area outside the department. This minor concentration must be approved by the graduate advisor during the student's first semester in the master's program.
2. The candidate's program must include:
   a. In mathematics: Any two of 452, 450, 455.
   b. In statistical theory: 480 or 483, and 580.
   c. In statistical methods: 484 and at least 3 hours chosen from 473, 481, 485, or 583. This requirement may be met in whole or in part by means of equivalent courses taken elsewhere prior to acceptance for graduate study in the department.
3. The candidate must demonstrate proficiency in Fortran or Pascal computer programming. This can be satisfied either by obtaining a letter grade of *B* or better in an appropriate course or by passing an examination given by the Department of Mathematics.
4. The candidate must prepare a research paper or thesis (3 hours credit in MATH 595 or 599) under the supervision of a research adviser and two other faculty members from the department. This committee will be appointed by the graduate adviser after consultation with all those involved.
5. The candidate must demonstrate satisfactory performance on a final oral examination covering the graduate course work and the research paper or thesis. This examination will be given by the 3 members of the candidate's committee and chaired by the research adviser.

Master of Arts Degree in Mathematics

Students will be considered for acceptance into the M.A. degree in mathematics program if they have completed with distinction the equivalent of a strong undergraduate major in mathematics. Once accepted, the requirements are as follows:

1. The candidate must complete a total of 30 semester hours of graduate level mathematics courses of which at least 15 must be at the 500 level.

2. The candidate must complete with a grade of *B* or better each of the courses MATH 419, 421, 433, 452, and at least 3 of the courses MATH 501, 519, 530, 555. This requirement may be met in whole or in part by means of equivalent courses taken elsewhere.
3. The candidate must demonstrate the ability to read mathematical literature in French, German, or Russian. This may be certified by passing with a grade of *B* or better the research tool course 488 offered by the Department of Foreign Languages and Literatures, by passing with a score of 465 or better an examination given by the Educational Testing Service of Princeton, NJ, or by passing a suitable examination given by a faculty member from the Department of Mathematics who has been approved by the graduate adviser.
4. The candidate must prepare a thesis (3 hours credit in MATH 599) under the supervision of a thesis adviser and 2 other faculty members from the department. This committee will be appointed by the graduate adviser after consultation with all those involved.
5. The candidate must demonstrate satisfactory performance on a final oral examination covering the graduate course work and the thesis. This examination will be given by the 3 members of the candidate's committee and chaired by the thesis adviser. The student will pass the examination if the thesis adviser and at least 1 of the other 2 committee members so agree.

Doctor of Philosophy Degree

Students will be considered for acceptance into the doctoral program if they have completed with distinction a graduate program comparable to that required for a master's degree in mathematics, statistics, or computer science at SIUC. Additional evidence of outstanding scholarly ability or achievement (e.g., a high score on the advanced section of the Graduate Record Examination or published research papers of high quality) will lend strength to the application. Students must have completed 419, 421, 433, and 452 or their equivalent before entering the doctoral program.

Once admitted, the requirements are as follows:

1. The candidate must pass the departmental qualifying examination by the end of the February following the second fall semester in the doctoral program. This qualifying examination, which is given twice annually in February and September, covers 3 areas each of which is commensurate with a regularly scheduled 500 level graduate course at SIUC. After consultation with the graduate adviser candidates will choose the 3 areas over which they are to be examined, with 2 of 3 chosen from MATH 501, 519, 530, 580 including at least one of 501 and 519. The coursework in two courses chosen from the list of four above will not be counted toward completing the major area discussed in 3. below. The third area normally corresponds to another regularly scheduled 500 level mathematics course but with the approval of the graduate adviser the third area may be chosen from a related field outside the department. A candidate who fails the qualifying examination within the allotted time will be dropped from the doctoral program.
2. The candidate must demonstrate competence with two research tools. The ability to read mathematics in any one of the languages French, German, or Russian serves as a tool. This may be certified by passing with a grade of *B* or better the research tool course 488 offered by the Department of Foreign Languages and Literatures, by passing with a score of 465 or better an examination given by the Educational Testing Service of Princeton, NJ, or by passing a suitable examination given by a faculty member from the Department of Mathematics who has been appointed by the graduate adviser. A proficiency in computer programming will also serve as a research tool.

This may be certified by passing with a grade of *B* or better CS 202 and either CS 204 or by passing a suitable examination given by a faculty member from the Department of Mathematics who has been appointed by the graduate adviser.

3. Mathematics 501, 519, and 530, or their equivalent are required courses for all doctoral students. The candidate must complete a major (12 hours) and two minors (6 hours each) chosen from the following list: algebra, analysis, applied mathematics, combinatorics, differential equations, number theory, numerical analysis, probability and statistics, topology, and geometry. The course work in the major and minor areas must be at the 500 level and exclusive of the courses used to satisfy the qualifying exam.
4. The candidate must file a request with the graduate adviser to appoint a dissertation committee to supervise the remaining doctoral work. This committee shall consist of 5 members with the candidate's dissertation adviser as chair. At least one member of the committee must represent each of the minor areas, and the dissertation adviser and one other member will represent the major area. One member of the committee will be chosen from outside of the department. This committee will be appointed by the graduate adviser after consultation with the candidate, the proposed dissertation adviser, the department chair, and the other faculty members involved.
5. The candidate must pass a preliminary examination over the major and minor areas. This examination will normally be given after satisfying the research tools requirement and within 18 months after passing the qualifying examination. The preliminary examination will consist of a written examination over the major area and an oral examination over the major and the two minor areas. This examination will be prepared, administered, and evaluated by the dissertation committee. Any member of the graduate faculty may attend the oral portion of the preliminary examination and (at the discretion of the committee chair) question the candidate. The candidate will pass the preliminary examination provided that 4 members of the committee including the chair so agree. A report on the examination will be included with the candidate's official academic records. In the event that the candidate's performance is unsatisfactory, the committee as a whole shall decide on the time and content of an appropriate re-examination. A candidate who fails the re-examination will be dropped from the doctoral program.

   In unusual circumstances a candidate who has passed the preliminary examination may wish to change the major area or dissertation adviser. This will be allowed if the graduate adviser and department chair so agree in which case the dissertation committee will be reconstituted in an appropriate manner. The revised committee may then prescribe additional course work and require the candidate to retake the preliminary examination.
6. The candidate must be officially admitted to candidacy for the Ph.D. degree. This will be done after all of the above requirements have been met.
7. The candidate must complete a dissertation (representing at least 24 hours in MATH 600) under the supervision of the candidate's dissertation adviser. The dissertation adviser and the other 4 members of the dissertation committee will evaluate the quality of the completed work which must conform to high literary and scholastic standards and constitute an original and publishable contribution to mathematics. A final oral examination will be conducted by the dissertation committee. During this examination the candidate will first present the major results of the dissertation and then respond to questions. Any member of the University graduate faculty may attend and (at the discretion of the dissertation adviser) ask related ques-

tions. The dissertation will be accepted provided the dissertation adviser and at least 3 of the other 4 members of the committee so agree.

As a matter of policy, the Department of Mathematics does not provide any student working for a master's degree financial support for more than two years nor a Ph.D. student more than four years past the master's or master's equivalent.

Mechanical Engineering and Energy Processes

Master of Science Degree in Mechanical Engineering

Graduate work leading to the Master of Science degree in mechanical engineering is offered by the College of Engineering and Technology. The program is designed to provide advanced study in air pollution control, mass and heat transfer, coal conversion, electrochemical processes, thermal science, thermal systems design, solar systems design, chemical and biochemical processes, mechanical systems, computer-aided design, composite materials and ceramics.

Admission

Students seeking admission to the graduate program in mechanical mecineering must meet the admission standards set by the Graduate School and have a bachelor's degree in engineering or its equivalent. A student whose undergraduate training is deficient may be required to take coursework without graduate credit.

Requirements

Each student majoring in mechanical engineering will develop a program of study with a graduate advisor and establish a graduate committee of at least three members at the earliest possible date. A student may with the approval of a graduate faculty committee and the department chair also take courses in other branches of engineering, or in areas of science and business, such as physics, geology, chemistry, mathematics, life science, administrative sciences, or computer science. A thesis committee of at least three members will approve the thesis and the comprehensive oral exam.

For a student who wishes to complete the requirements of the master's degree with a thesis, a minimum of thirty semester hours of acceptable graduate credit is required. Of this total, eighteen semester hours must be earned in the Department of Mechanical Engineering and Energy Processes. Each candidate is also required to pass a comprehensive oral examination covering all of the student's graduate work including thesis.

If a student prefers the non-thesis option, a minimum of thirty-six semester hours of acceptable graduate credit is required. The student is expected to take at least twenty-one semester hours within the Department of Mechanical Engineering and Energy Processes including no more than three semester hours of the appropriate 592 course to be devoted to the preparation of a research paper. In addition, each candidate is required to pass a written comprehensive examination. An oral presentation of the paper may be required.

Each non-thesis student will select a minimum of three engineering graduate faculty members to serve as a graduate committee, subject to the approval of the chair of the department. The committee must include at least one member from one of the other engineering departments and will:

1. approve the student's program of study,
2. approve the student's research paper topic,
3. approve the completed research paper, and

4. administer and approve the written comprehensive examination.

Teaching or research assistantships and fellowships are available for qualified applicants. Additional information about the program, courses, assistantships, and fellowships may be obtained from the College of Engineering and Technology or the Department of Mechanical Engineering and Energy Processes.

Microbiology

The Department of Microbiology offers graduate work leading to the Master of Arts and Doctor of Philosophy degrees in microbiology. The programs are designed to provide advanced training in bacteriology, genetics, immunology, microbial physiology, molecular biology, and virology. Both programs involve in-depth research.

Admission, Advisement, and General Requirements

Prospective graduate students must submit 2 separate application forms, 1 for the Graduate School and the other for the Department of Microbiology. Graduate Record Examination (GRE) scores and 3 letters of recommendation are required as part of the departmental application.

Prerequisites for graduate training in microbiology include the equivalent of an undergraduate major in one of the biological sciences plus one year each of organic chemistry, physics, and suitable university level mathematics. Deficiencies in these requirements must be made up early in graduate training. In addition, students without a microbiology background will be required to take Microbiology 301 and obtain a grade of at least *B,* or pass an equivalent proficiency examination with a grade of 80% or better during the first week of the entering semester.

Admission to the master's degree program requires a minimum grade point average (GPA) of 2.70 (*A* = 4.00) on all undergraduate work. Selected students can be admitted directly to the doctoral program through the Ph.D. accelerated entry option. For all other students admission to the doctoral program requires a master's degree or its equivalent and a minimum GPA of 3.25 in all graduate course work. All admissions are subject to final approval by the department.

The departmental graduate adviser will assist each student with the initial planning of a program of study, including required courses, anticipated dates for fulfillment of specified requirements, etc. The adviser will also organize and supervise MICR 501, Preprofessional Training, a one hour course required of all incoming microbiology graduate students. Similarly the adviser will also assist the student in arranging for a graduate faculty advisory committee and its chair to assume the continuing responsibility of planning the program of study and directing the research project for the degree.

Ph.D. Accelerated Entry Option

The Department of Microbiology offers the Ph.D. accelerated entry option to graduate students who have made an early commitment to a doctoral degree and meet certain criteria. At the end of two semesters of studies at the master's level, the graduate student's advisory and research (thesis) committee will review the student's credentials in order to establish eligibility to enter this program. The student's committee then has the option to recommend continuation in the master's program, or to approve application to enter the doctoral program.

The student's advisory and research (thesis) committee must establish that the student is prepared and able to conduct research at the doctoral level. This can be established by criteria such as seminars or other presentation of a research proposal. Further the student must have a GPA of 3.50 in all graduate course work, exclusive of research, special topics, etc., and letters of reference at-

testing to the student's outstanding ability and potential to perform doctoral research.

Upon approval of the student's eligibility by the department, the chair will prepare a written review of the student's qualifications for entry into this option. This must be submitted to the Graduate School for waiver of a master's degree or master's equivalency before entry into the doctoral program.

A student admitted to the doctoral program under this option is subject to all retention and exit requirements for the Ph.D. program including residency, examinations, GPA, dissertations, and all applicable time limits.

Master's Degree

Each candidate for the master's degree is required to complete 30 semester hours of acceptable graduate credit, in addition to MICR 501 including a minimum of 8 hours of thesis and research credit. The student is required to pass a comprehensive examination in microbiology and the thesis topic, and must present an approved thesis based on a laboratory research problem. Most students require two years to complete the work for a master's degree.

At least 15 of the 30 semester hours must be in microbiology courses numbered 500 or above. Within the 15 semester hours of 500 level credit, each student must successfully complete 8 semester hours of credit selected from departmental courses numbered 504, 520, 530, 542, 543, 551, 552, 553, and 562, taken once. The remaining credit hour requirements may be elected from the 400-and 500-level courses in the department or other departments with the approval of the graduate adviser. All students are required to enroll in MICR 500 (seminar) for credit in each semester they are registered up to a maximum of four semesters.

Copies of the draft thesis must be submitted to the advisory committee and the department chair at least 6 weeks before commencement. The approved thesis, in final form, must be submitted to the dean of the Graduate School at least 3 weeks before commencement.

The department does grant the master's equivalency on the basis of a comprehensive final examination administered by the advisory committee and a research paper. The granting of the master's equivalency does not confer admission to the Ph.D. program. Students wishing to take the master's equivalency should consult with their research adviser, the graduate adviser, and the department chair.

Doctoral Degree

Each prospective candidate for the doctorate is required to complete a minimum of 24 semester hours of dissertation credit, satisfy the course requirements, pass the qualifying examination, write and defend an acceptable dissertation based on a laboratory research problem, and meet the Graduate School residency requirements after admission to the doctoral program and before admission to candidacy.

All students will be expected to take a one year sequence in biochemistry (CHEM 451a and b, or its equivalent). In addition, all students will be expected to demonstrate a mastery of the fundamentals of the several fields included in the discipline of microbiology. This requirement will be achieved by completing 3 of the following: 520, 542, 543, 551, 553, and 562 or 2 of these and a non-prerequisite 400-level lecture course. Course equivalency will be decided by the department graduate adviser, the faculty member in charge of the relevant course, and the department chair. The GPA attained in these courses must be at least 3.25.

During their first two years in the graduate program all students must enroll in MICR 500 (seminar) for credit every semester. Advanced students are expected to attend all seminars but need not enroll.

The student is eligible to take the preliminary examination after completing the course requirements. After passing the preliminary exam and meeting the Graduate School residency requirements, the student is advanced to candidacy for the doctorate. The preliminary exam shall be administered as follows.

An approved student advisory committee (5 members of the graduate faculty) will prepare and administer a written preliminary exam covering several phases of microbiology, with particular emphasis in the area of concentration declared. This declaration will be done by means of a prospectus of a dissertation containing a proposal for the dissertation research, biographical information on the candidate, and a list of courses taken during the candidate's graduate program. The prospectus shall be in the hands of the committee members at least 14 days prior to the date of the examination. Upon satisfactory completion of the written exam the candidate will meet with the committee as a whole and discuss the prospectus in detail. At this time the committee may ask in depth questions about the research project or other phases of microbiology particularly relevant to the candidate's research. A written exam score of at least 80% is required before a student can proceed to the oral portion of the preliminary exam, and at least 4 of the 5 committee members must judge the oral performance acceptable for a student to pass the preliminary exam overall. In the event that either the written or oral preliminary exam is failed, a student may request only one re-examination.

The Ph.D. preliminary exam (both written and oral portions) must be completed within 30 months of the date of entrance into the Ph.D. degree program.

Students working towards the doctoral degree should consider the following steps applicable to the dissertation.

1. The student and the major professor of the advisory committee determine the general nature of the research problem.
2. After formulation, the problem should be discussed with the advisory committee before extensive work is done. A discussion of the problem may be presented in a departmental seminar.
3. Periodic meetings of the student with the advisory committee are encouraged.
4. Copies of the draft dissertation should be available to the advisory committee at least 2 months prior to the deadline established by the Graduate School. The dissertation must be defended by the student in a public oral examination. The approved completed dissertation is transmitted to the dean of the Graduate School.

Mining Engineering

Master of Science Degree in Mining Engineering

Graduate work leading to the Master of Science degree in mining engineering is offered by the College of Engineering and Technology. The program is designed to provide advanced study in areas such as rock mechanics and ground control, finite element analysis of mining structures, experimental rock mechanics, mine subsidence, coal processing, computer simulation of coal processing plants, surface and underground mining systems performance optimization, evaluation of innovative mining systems, mineral economies and operations research, surface mine reclamation, in-situ mining, and waste disposal.

Admission

Students seeking admission to the graduate program in mining engineering must meet the admission standards set by the Graduate School and have a bachelor's degree in engineering or its equivalent. A student whose undergradu-

ate training is deficient may be required to take coursework without graduate credit.

Requirements

A graduate student in mining engineering is required to develop a program of study with a graduate advisor and a graduate committee. Each student majoring in mining engineering may, with the approval of the graduate committee, also take courses in other branches of engineering or in areas of science and business, such as physics, geology, chemistry, mathematics, life science, administrative sciences, or computer science.

For a student who wishes to complete the requirements of the master's degree with a thesis, a minimum of thirty semester hours of acceptable graduate credit is required. Of this total, eighteen semester hours must be earned in the mining engineering department. Each candidate is also required to pass a comprehensive oral examination covering all of the student's graduate work including thesis.

If a student prefers the non-thesis option, a minimum of thirty-six semester hours of acceptable graduate credit is required. The student is expected to take at least twenty-one semester hours within mining engineering including no more than three semester hours of the appropriate 592 course to be devoted to the preparation of a research paper. In addition, each candidate is required to pass a written comprehensive examination and an oral examination on the research paper.

Each student will select a minimum of three engineering graduate faculty members to serve as a graduate committee, subject to the approval of the chair of the mining engineering department. The committee must consist of at least one member from one of the other engineering departments and will:

1. approve the student's program of study,
2. approve the student's research topic,
3. approve the completed research paper or thesis, and
4. administer and approve the written comprehensive or oral examination.

Teaching or research assistantships and fellowships are available for qualified applicants. Additional information about the program, courses, assistantships, and fellowships may be obtained from the College of Engineering and Technology or the Department of Mining Engineering.

Molecular Science

Molecular science is an interdisciplinary Ph.D. program designed to provide advanced education for those students who desire to pursue scientific careers which require understanding at the molecular level. The program draws its faculty from departments in the College of Science, the College of Engineering and Technology, the College of Liberal Arts, and the School of Medicine. This faculty offers a variety of interdisciplinary areas of research. Examples of such areas are molecular biology, biophysics, geophysics, geochemistry, coal science, chemical physics, catalysis, engineering science, and applied mathematics.

Students may enter the program with a master's degree from diverse educational backgrounds including the physical sciences, engineering, the life sciences, and mathematics. During the initial phase of study it is expected that most students will take some undergraduate courses in the areas of mathematics, physics, chemistry, and biology to expand their basic knowledge to the required breadth. Then in their second phase of study, each student will take 3 preliminary examinations in the graduate breadth areas of their choice. Additionally, a written examination will be required for each student in their own specialty area, and this will be followed by an oral examination which will in-

clude the 3 breadth areas as well as the area of emphasis. Passing these preliminary examinations and a research tool requirement qualify a student for admission for candidacy.

In their third and final phase, candidates for the Ph.D. degree must complete their research, write their dissertation, and pass an open oral examination on their dissertation work.

Because students enter the program from different backgrounds, it is difficult to predict the time required for each student to complete each phase. In practice the phases overlap. Phases one and two occur in the first year with phase two continuing through the second year. Research usually starts during the second year. A well prepared student might complete the program in 3 years; however, 4 years is a reasonable average time to expect most students to complete the program.

Admission to Graduate Study

Admission to the Ph.D. program with a major in molecular science requires a master's degree or its equivalent in the physical sciences, life sciences, mathematics, or engineering. In addition, the student must have a grade point average of at least 3.25 in graduate courses.

Students holding the baccalaureate degree in the above listed fields are admissible to graduate study in preparation for subsequent admission to the molecular science program. They may join the program after either obtaining a master's degree or its equivalent. Application for master's equivalency requires (a) completion of 30 semester hours of acceptable graduate credit, at least 15 hours of which must be courses numbered 500 or above, and (b) completion of an approved research paper which demonstrates evidence of the student's knowledge of research techniques, and which is based on a special research project. In addition to the other subject matter they may have studied, students must have the background listing below (SIUC equivalency courses are listed in parentheses):

- Mathematics — through differential equations (MATH 150, 250, and 305).
- Chemistry — freshman chemistry, one semester of organic chemistry, and one semester of either physical chemistry or the third semester of university physics (CHEM 222AB-8, or 224-5 and 225-2 plus 340-4 and either 460-3, or PHYS 205C-3).
- Physics — two semesters of sophomore level physics and either the third semester of university physics or physical chemistry (PHYS 203AB-6, or 205AB-6 plus 205C-3, or CHEM 460-3).
- Biology — a minimum of two semesters beyond General Studies biology (either two courses chosen from BOT 335, CHEM 352, MICR 301, MICR 302, PSYCH 312, and ZOOL 309 or three courses from BIOL 305, 306, 307, 308, 309, and PHSL 210).

Since the program in molecular science is interdisciplinary and broadly based, it is anticipated that many students entering the program will not have the breadth indicated above. This breadth may be attained by taking the regularly offered courses listed in parentheses. The program chair will determine course equivalencies between SIUC and other schools.

Retention in the Program

After completion of phase one, the performance of each student will be evaluated by the executive committee. The executive committee will make a decision on the continuation in the program for each student. Affirmative action by the committee certifies the student to be qualified to undertake further study in molecular science.

Admission to Candidacy for Ph.D.

After satisfying the breadth requirements and completing the research tool requirement, the student may seek admission to candidacy for the Ph.D. degree major in molecular science. This may be accomplished by passing 3 preliminary breadth examinations from the following list and by passing a fourth preliminary examination in the student's area of emphasis. The nature of these examinations is described in the following paragraphs.

The student will choose 3 breadth areas from the following list of 8 broad preliminary examination areas. Each of these breadth areas is described by graduate courses. The student may pass each breadth area in 2 ways: (1) by passing 2 or more of the designated courses with a grade average of at least 3.5, or (2) by passing a comprehensive written examination in the breadth area.

Breadth Areas.
Quantum Theory and Molecular Spectroscopy.
Statistical Mechanics and Thermodynamics.
Engineering Sciences I: Electrical Sciences and Systems or Fluid and Solid Sciences.
Engineering Sciences II: Transfer Processes or Material Sciences.
Applied Mathematics.
Biochemistry or Organic Chemistry.
Biophysics.
Molecular Biology.

The chair of the molecular science program will appoint faculty members to design, administer, and evaluate the preliminary examinations in the breadth areas.

The student and the student's dissertation adviser will designate an area of emphasis. The preliminary examination in this specialty area will be written and will be followed by an oral examination which will also include the 3 breadth areas. The written examination will be composed under the direction of the student's dissertation adviser. The oral examination will be conducted by the student's committee. The purpose of this last oral examination is to establish that the student is, in fact, a Ph.D. candidate.

Failure by the student to pass any preliminary examination will lead to a review of the student's status by the executive committee and the student's committee. They may decide (1) to allow the student to retake only the failed examinations, (2) to require the student to retake both the failed examinations as well as the examinations in which the student demonstrates weakness to the extent that the performance was considered border line pass, or (3) to terminate the student. In any case, no student will be allowed more than 2 tries at passing any one preliminary examination in any area. Additionally, permission to choose a different area after failure in one must be approved by both the executive committee and the student's committee. Such permission may be approved only once.

The research tool requirement is satisfied either by passing the ETS examination in French, German, or Russian or by demonstrating competence in computer programming.

Requirements for the Ph.D. Degree with a Major in Molecular Science. A candidate for the Ph.D. degree must meet the general requirements as set forth by the Graduate School.

Advisement Procedures

The program chair will serve as graduate adviser for the program. Each student is expected to consult the chair in planning the initial part of the graduate pro-

gram in developing a course of study in preparation for the preliminary examination. The student must also request approval for a dissertation adviser no later than 3 semesters after being admitted to the program. The dissertation adviser will recommend a Ph.D. committee which the program chair will submit for approval by the dean of the Graduate School. The student's committee will work out with the student and monitor a scheduled program for completion of the Ph.D. degree.

Music

The School of Music faculty numbers twenty-seven full-time positions. Within its ranks are to be found many outstanding performers and educators, representing a broad diversification of background and talent. Faculty members present many solo and small ensemble performances, as well as clinics and workshops, during the school year. Sixteen members of the faculty hold doctorates or its equivalent.

Library Facilities

In addition to Morris Library, the School of Music has its own recording and score library, including modern stereo listening facilities, cassettes, and cassette decks for self-instruction in ear training and music literature, some 1600 LP recordings and tapes, over 1100 scores, many in multiple copies, and 94 books and reference works. The self-instruction center in Morris Library provides tape recordings of theory and literature for student use.

Musical Organizations

A wide variety of performing opportunities is available, including the University Symphony, symphonic band, wind ensemble, jazz ensemble, Marching Salukis, brass ensemble, guitar ensemble, percussion ensemble, choral union, concert choir, chamber choir, and vocal jazz ensemble. The Marjorie Lawrence Opera Workshop presents one full opera production each year in addition to several programs of small operas and operatic excerpts. The Summer Music Theater presents two full-scale musicals during the summer session.

Musical Performances

Some 130 School of Music programs are presented each year, plus Southern Illinois Concert Series and Celebrity Series appearances by well-known concert artists. A program booklet for further details concerning concert activity is available through the School of Music.

Other Resources

A fifty-eight rank Reuter pipe organ, the principal instrument for recitals and teaching, is installed in Shryock Auditorium. Available for practicing are a four-rank Ott tracker organ, a six-rank Moeller, and a four-rank Wicks. Eighty-five pianos, including twenty-two in practice rooms, an eighteen-unit electronic piano lab, and a full complement of band and orchestral instruments are available.

Graduate Assistantship and Fellowship Applications

Any student seeking a master's degree may apply to the coordinator of graduate studies in music for a graduate assistantship. An undergraduate overall grade-point average of 2.8 (A = 4 points) is required for consideration. The assignment of assistantships, for those who are eligible, is based upon School of Music needs and student qualifications. A student with an overall grade-point average of 3.5 or better is eligible to apply for a graduate fellowship involving no School of Music assignment. The School of Music offers six programs leading to the Master of Music degree. Each master's degree requires a minimum total of 30 credits, with

a minimum total of 15 credits at the 500 level. Students enrolled in a program leading to a Ph.D. degree major in education, with a concentration in curriculum and instruction education, may choose the elective portion of their programs from graduate courses offered in the School of Music.

Master of Music Degree Standard Curricula

MUSIC HISTORY AND LITERATURE CONCENTRATION

Majors complete MUS 501-3; 502-4 (2,2); 2 credits (1,1) from 566; 6 credits selected from 475, 476, 477, 573, 574, or 578; 599-6; 6 credits in music history-literature electives; 3 elective credits in non-music history-literature courses. In addition to the general requirements for graduation, music history/literature majors must have successfully completed two years of a foreign language (preferably French or German), at the undergraduate level, or pass 388-488 (German or French) as a research tool with a grade of *B* or higher.

MUSIC THEORY AND COMPOSITION CONCENTRATION

Majors complete MUS 501-3; 502-4 (2,2); 545-3; 3 credits from the 470 or 570 series; 480-4 (580-4 must be completed by composition majors); 2 credits (1,1) selected from 566; 599-6; 5 credits of approved music electives in theory-composition, history-literature, conducting, or performance.

PERFORMANCE CONCENTRATION

Majors complete MUS 501-3; 502a or b (2); 5 credits from 461, 482, or 470 or 570 series; 8 credits in 540 (440 if specializing in pedagogy); 2 credits from 566, 567, or 568 (or other electives if keyboard major); 6 credits in 595 and 598 (recital and document); 4 credits in non-performing music elective. If specializing in conducting, majors must complete MUS 501-3; 502-4 (2,2); 556-4 (2,2); 3–6 credits from the 470 or 570 series; 2–4 credits in 440; 2 credits from 566 (1,1) or other electives if keyboard major; 6 credits in 595 and 598 (recital and document); 3 credits in music electives.

OPERA/MUSIC THEATER CONCENTRATION

Opera and music theater majors must have an undergraduate degree major in music with appropriate experience in opera or music theater, or in theater with additional music study sufficient to qualify in performance, theory, and history of music. Core courses (required) include MUS 468 (2–4); 501 (3); 570 (3); 595 (2); 598 (4) or 599 (6) in lieu of 598 and 595. Also required are MUS 567 or 568 (1,1,1,1); and 6 credits from 440–540; 461; 472; 479c or 556. In addition, 6 hours of theater credits must be earned from THEA 402a,b, 403, 404, 407, 409, 410, 414, 417, 418, 502, 513a,b, 514, 517, a,b, 522, or 530.

PIANO PEDAGOGY CONCENTRATION

Majors complete hours of credit in the following music courses: 3 in 501; 4 in 440 or 540; 4 in 498 and 2 in 595 or 4 (2,2) in 498 and 2 in 595 or 2 in 498 and 4 in 599; 410; 510 (2,2,2); 2 (1,1) from 566; 3 credits from approved music electives; and 4 credits from approved non-music courses (in fields of guidance and educational psychology, higher education, philosophy, and speech communication).

MUSIC EDUCATION CONCENTRATION

Majors complete MUS 501-3; 502a or b (2); 503 and 509; 7 credits of approved music electives including 5 hours of music education courses; 2 credits (1,1) from 566; 5 credits from the 470 and 570 series; 599-6 or 6 credits from 499 and 595; or 595 and 598.

General Information

Fees. Fees are not charged for individual instruction, practice rooms, or instrument lockers. Instruments are loaned without charge when needed. Student expenses for music, textbooks, and other incidental supplies are usually nominal.

Advisement. The graduate coordinator in music supervises the overall planning of the student's program and designates the document or thesis director.

Diagnostic tests in music theory and history are given during orientation at the beginning of the fall semester and must be taken by all students at the first opportunity after admission. The student with weaknesses in certain areas may be asked to take additional work in those areas. A student will be accepted as a performance major in the Master of Music degree program after satisfactory audition in person, either before admission or during orientation. A performance major may be conditionally accepted on the basis of a tape recording; but a student accepted conditionally may be asked to audition in person during orientation or during the first term of residence, and may be required to register at the 400 level in performance until approved by personal audition. Current brochures from various performance areas and the *Graduate Handbook in Music* describe the level of repertory expected, audition procedures, and diagnostic tests.

Ensemble Requirement. All graduate students are required to register for MUS 566 (MUS 567 or 568 may substitute for MUS 566 only for those students whose concentration is opera music theater) each semester of degree study (summers excepted). Participation is required each semester in one or more of the following: Marching Salukis, symphonic band, wind ensemble, symphony, choral union, concert choir, chamber singers, or guitar ensemble. In addition, students may elect participation in other regularly scheduled emphasis. Graduate assistants assigned ensemble accompanying must register for alternate ensemble for credit. Petitions for exceptions to the ensemble requirement must be made in writing and presented to the School of Music graduate committee for consideration.

Exceptions to Degree Requirements. Appropriate substitutions in the curriculum for the Master of Music degree may be made if recommended by the student's adviser and approved by the graduate committee in music. Students who expect to earn more than half of their credits during summer terms only, or by a combination of summer attendance and night classes, may similarly propose a sequence of course offerings, following the above curricular patterns as far as possible. All curricula must meet Graduate School requirements and be approved by the graduate committee in music. Special summer students changing plans and registering for more than one regular fall or spring semester will ordinarily follow the appropriate standard curriculum.

The Thesis, Document, and Research Paper. All master's degree candidates will complete either (1) a thesis, or (2) a large, original composition and document, or (3) a full recital performance and document.

No later that the beginning of the semester preceding the semester in which the student expects to graduate, the graduate coordinator, in consultation with the student, will designate a document or thesis director from the current list of graduate faculty from whom a student has taken graduate level courses. The document or thesis director guides the student's choice of topic and is responsible for the progress and quality of the resulting work. The document director normally heads the student's orals committee. Before any work is begun on the thesis or document, the student submits a proposal, together with a selective

bibliography where applicable and the reactions of the document or thesis director, to the coordinator of graduate studies in music for approval by the graduate committee. Changes of topic or of document director after initial approval must be approved by the music graduate committee.

Graduate Recital (598-4) is supervised by a jury of at least 3 members, headed by the student's instructor in performance. This jury approves the level of literature to be performed and acceptability of the performance by means of an audition in advance of the final performance.

Comprehensive Examinations. During the final semester of study, and after completion of the document or thesis, the student will take comprehensive examinations dealing with general areas of music and concentrations of music study, and, when appropriate, with the student's thesis or document. Application to take comprehensive examinations must be made at the beginning of the students last semester of study. The examinations must be passed in time to meet Graduate School deadlines. Application for comprehensive examinations may not be made until all other requirements, with the exception of terminal-semester courses, for the degree have been satisfied. A failed section of the comprehensive examinations may be taken again in a following term.

The oral examination committee, appointed by the coordinator of graduate studies in music, is headed by the student's document or thesis director with two or more faculty members with whom the student has had graduate level classes, as requested by the student. If the student has scheduled 6 or more hours in a department other than music, a member of this department will be invited to serve on the examining committee. The examination committee will conduct the student's oral examination and will supply questions for the student's written examination.

Three copies of all theses, thesis-composition manuscripts, and tapes and documents must be submitted in final form to the music graduate office at least 5 weeks before the intended date of graduation, carrying the approval of all members of the student's graduation committee. The graduate coordinator will forward 1 copy of a student's document (2, if a thesis) to the Graduate School and retain 1 copy.

Pharmacology

Graduate courses of study leading to the Master of Science and Doctor of Philosophy degrees in pharmacology are offered by SIU School of Medicine, Department of Pharmacology. Course offerings in the graduate program have been designed so that graduate students may acquire a broad basic knowledge as well as research experience in different areas of pharmacology. Graduate students may choose from a diversity of specializations when selecting a research adviser and a research topic. Excellent, well-equipped research facilities are available on the Springfield and Carbondale campuses. Graduate courses in pharmacology may be taken as part of a program leading to degrees in physiology, biological sciences, or toward a teaching specialty in secondary or higher education. Courses in pharmacology are also available to senior medical students, residents, and other non-majors with selected subspecialties such as psychiatry, medicine, (neurology and cardiology) and certain surgical subspecialties.

GENERAL REQUIREMENTS FOR ADVANCED DEGREES IN PHARMACOLOGY

Admission

The applicant must first be admitted to the Graduate School. The application and transcript, if approved, are then transmitted by the Graduate School to the Department of Pharmacology.

To receive an advanced degree in pharmacology, students must fulfill the requirements of both the Graduate School and the pharmacology graduate program. Students entering the pharmacology graduate program are required to have a strong background in physiology and biochemistry. Deficiencies, if they exist, should be fulfilled in Carbondale before coming to Springfield to complete the program.

Each student should possess an undergraduate degree in one of the biological sciences. Students with undergraduate training in related areas, such as chemistry, physics, mathematics, computer science, psychology, or engineering are strongly encouraged to consider graduate work in pharmacology. All students must present certification of credit or its equivalent (earned either as an undergraduate or a graduate student) for the following in order to be eligible for admission to an advanced degree program.

1. Inorganic chemistry (2 semesters)
2. Organic chemistry (2 semesters)
3. Physics (2 semesters)
4. Mathematics (2 semesters)

Students may be admitted with deficiencies in the above areas, but must remedy these prior to obtaining an advanced degree.

Admission into the pharmacology graduate program requires an undergraduate grade point average (GPA) of 3.0 ($A = 4.0$) for admission into the master's program. A GPA of 3.25 ($A = 4.0$) on undergraduate work is required for the direct entry (post-baccalaureate degree) option into a doctoral program. A GPA of 3.25 ($A = 4.0$) in graduate level work is required for admission into a doctoral program from a post-master's or by the accelerated entry (from a master's program) option.

In addition to the above general requirements, each applicant must submit:

1. Directly to the Graduate School: a completed application and original transcripts transmitted from each university or college attended by the applicant.
2. To the Department of Pharmacology: a brief (300 to 600 words) typed statement of goals and ambitions indicating why the applicant wishes to do graduate work in pharmacology.
3. Scores of the Graduate Record Examination (GRE) including scores on (a) the general and (b) one advanced section (biology or chemistry) taken within the past 12 months.
4. Three letters of recommendation from faculty who know the applicant's potential, written on forms supplied by the Department of Pharmacology.
5. International students must submit or request a copy of the TOEFL scores to be sent directly to the Graduate School. The Graduate School requires a score of 550 or better on the TOEFL.

Equivalent work completed at other institutions or in other collegiate units may be substituted for certain course requirements for graduate work in pharmacology if approval is obtained from the graduate school and the pharmacology graduate program committee.

Retention

All retention rules imposed by the Graduate School will be adhered to closely.

Master's Degree. An overall GPA of 3.0 (*A* = 4.0) in all graduate work in the program is required for retention. Any grade below *B* in a pharmacology core course must be compensated for by retaking the course and earning an *A* or *B* grade.

Doctor of Philosophy Degree. An overall GPA of 3.0 (*A* = 4.0) in all graduate work in the program is required for retention. Any student who makes a grade below a *B* in a pharmacology core course will not be retained in the Ph.D. degree program of the Department of Pharmacology.

Financial Assistance

The pharmacology graduate program offers financial assistance to qualified applicants accepted into the program. Teaching assistantships, research assistantships, and departmental fellowships are available, for which application is made directly to the Department of Pharmacology. Information and application forms for scholarships and loans may be obtained through the program director. Time limits for receiving support are governed by the Graduate School.

Graduate students should be aware that renewal of support whether it be in the form of a teaching assistantship, research assistantship, or fellowship is contingent upon satisfactory evaluation of the student's performance and upon time limitations for support. Failure to meet the requirements in any or all of these areas may lead to termination of support. The evaluation considers both the performance of assigned duties pertaining to the graduate assistantship and on progress in course work and research.

CURRICULUM REQUIREMENTS COMMON TO THE MASTER'S AND PH.D. DEGREES IN PHARMACOLOGY

All graduate students are required to complete formal course work in 2 areas: (1) the program core courses and (2) electives. The program core courses include PHRM 500, Pharmacology Seminar, in which all graduate students are required to present and participate every fall and spring semester; PHRM 500a and b, Principles of Pharmacology; PHRM 551, Methods in Pharmacology; and 1 advanced course of 3 credit hours for a master's degree, or 2 advanced courses of 3 credit hours each for a doctoral degree. Maximum course work for full-time graduate students is 16 hours per semester; 12 hours is considered average. For a student with a half-time assistantship, 12 hours is the maximum, 6 hours is the minimum.

All graduate students must acquire appropriate research tools as required by the Graduate School and the graduate student's advisory and research committee. Master's students are encouraged, but not required, to attain competence in at least 1 research tool. Doctoral students are required to attain competence in at least 2 research tools. Requirements for a research tool may be satisfied by establishing proficiency in statistics, computer sciences, electronics, advanced mathematics, electron microscopy, foreign language (Russian, German, or French), or a technique which is acceptable to the student's advisory and research committee. This may be accomplished by formal training or it may be demonstrated in a manner acceptable to the graduate student's advisory and research committee.

An advisory system in pharmacology will help students in planning their program. Upon admission to the master's or doctoral program, students will be advised by the pharmacology graduate program director until a research adviser is chosen by the student. The programs outlined by students, their advisers, and

advisory committees are subject to approval of the pharmacology graduate program committee. Students should select their research adviser no later than the end of their second (master's) and third (doctoral) semester in residence. The choice of adviser, and subsequently the advisory and research committee, is an important step and should be carefully considered.

As soon as a graduate student has selected a research adviser, a graduate research and advisory committee should be selected. The committee for a student in the master's program will consist of a minimum of 4 members: the student's research adviser (chair), 2 faculty members from pharmacology and 1 faculty member from outside pharmacology. The committee for a student in the doctoral program will consist of a minimum of 5 members: the student's research adviser (chair), 3 faculty members from pharmacology, and 1 faculty member from outside pharmacology. Members of this committee should be able to contribute significantly to the area of the student's research program. The student's research adviser via the graduate program director and the chair of the Department of Pharmacology will request approval of this committee by the dean of the Graduate School. The chair of the Department of Pharmacology and the graduate program director are ex-officio members for all advisory committees upon which they are not already members.

REQUIREMENTS FOR ADVANCED DEGREES IN PHARMACOLOGY

Master of Science Degree in Pharmacology

GENERAL REQUIREMENTS

1. A minimum of 2 years of full-time study (1 year in residence) is required for a master's degree. At least 15 of these must be in 500 level courses, 6 of which may be PHRM 599. A thesis must be completed in the student's research area of interest with the approval of the thesis committee.
2. A total of 30 semester hours at the 400 and 500 level is required for a master's degree. At least 15 of these must be in 500 level courses, 6 of which may be PHRM 599. A thesis must be completed in the student's research area of interest with the approval of the thesis committee.
3. A master's student must satisfactorily complete at least 21 hours of graduate course work graded *A, B, C.* These hours must be in courses at the 400/500 level.
4. A written comprehensive examination must be passed with a grade of *B* or better. It will be prepared, conducted, and evaluated by the pharmacology graduate program committee and will be given each fall and spring semester. This examination will become a part of the student's permanent file.
5. Before significant research has begun, a thesis proposal is required. The thesis proposal will be presented in a pharmacology seminar. Immediately following the seminar, the proposal will be defended orally before the student's advisory and research committee. The cover sheet for graduate student thesis proposal must be signed by all members of the student's advisory and research committee and filed with the graduate program director.
6. The thesis is expected to be a competent, original research project carried out in a selected area under the research adviser's supervision. It should include a statement of the problem, an adequate review of literature, a careful analysis of results by whatever methods are appropriate, and an interpretation of the work by a significant source. The student must submit a preliminary draft of the thesis to the adviser at least 10 weeks prior to graduation. A corrected copy must be submitted to other members of the advisory and research committee not later than 8 weeks before graduation.

7. Results of the thesis research must be defended in a pharmacology seminar which must be announced at least one week in advance by sending out proper notices. Immediately following the seminar, an oral examination will be conducted by the student's advisory and research committee; and it will cover the thesis. Any member of the University community may attend this examination and may participate in the questioning and discussion, subject to reasonable time limitations imposed by the committee chair. Only committee members may vote or make recommendations concerning acceptance of the thesis and the oral examination.
8. The student will be recommended for the degree if members of the student's advisory and research committee judge both the thesis and the performance at the oral examination to be satisfactory. Evaluation forms will be completed by the student's advisory and research committee. If approved, a thesis approval form will be completed, signed by the student's major adviser and the chair of the Department of Pharmacology, and transmitted to the Graduate School. The examination may be repeated once, at least 3 months after the first examination. A second failure will result in dismissal from the pharmacology graduate program.
9. Each student is required to have 6 credit hours of PHRM 599, Thesis Research. A student who has completed all course work and has registered for the minimum of thesis research hours required for the degree must register in PHRM 601, Continuing Enrollment, until completion of the degree.
10. It is the student's responsibility to give 2 appropriate unbound copies of the thesis to the Graduate School. One bound copy should be given to the graduate program director and 1 to the adviser at least 3 weeks prior to graduation.

REPRESENTATIVE SCHEDULING

Below is a representative schedule of the requirements for the master's degree in pharmacology. In addition to the core course requirements listed below, additional electives offered include: PHRM 565-2, Toxicology; PHRM 560-2, Geriatrics Pharmacology; and PHRM-1 to 24, Readings and Research in Pharmacology.

In Carbondale	Credits
Year 1 — Fall Semester	
PHSL 410a Mammalian Physiology	5
CHEM 451a Biochemistry	3
PHSL 500 Advanced Seminar	1
Total	9
Year 1 — Spring Semester	
PHSL 410b Mammalian Physiology	5
CHEM 451b Biochemistry	3
PHSL 500 Advanced Seminar	1
Total	9

In Springfield	
Year 1 — Summer Semester	
PHRM 551 Methods in Pharmacology	4
Total	4
Year 2 — Fall Semester	
Choose Adviser and Formulate Thesis Committee	
PHRM 500a Principles of Pharmacology	4
PHRM 500b Principles of Pharmacology	4
PHRM 500 Seminar in Pharmacology	1
Total	9

Year 2 — Spring Semester
Thesis Proposal Defended Orally

*PHRM 555 Cardiovascular Pharmacology	3
*PHRM 574 Neuropharmacology	3
PHRM 599 Thesis Research	3
PHRM 500 Seminar in Pharmacology	1

*Choice of One Advanced Course
Year 2 — Summer Semester,
Written Comprehensive Exam of Course Work

PHRM 599 Thesis Research	3
Total	3

SUMMARY OF REQUIREMENTS

Achieve grade point average of at least a 3.0 (*A* = 4.0)
Completion of the research tools required by the thesis committee
Oral defense of thesis proposal
Comprehensive written exam of course work
Submission of thesis to adviser (10 weeks prior to graduation)
Corrected thesis to thesis committee (8 weeks prior to graduation)
Announcement of thesis defense (1 week prior notice)
Oral defense of thesis
Submission of approved thesis to Graduate School (2 copies), graduate program director (1 copy), and adviser (1 copy) 3 weeks prior to graduation
Submission of departmental clearance form

Doctor of Philosophy Degree in Pharmacology

GENERAL REQUIREMENTS

1. Students entering the doctoral program in pharmacology should present as minimum the requirements listed for the master's degree program. In addition it is strongly recommended that the doctoral student have completed calculus and physical chemistry.

   Students entering the doctoral program in pharmacology may choose to be admitted under 1 of 3 options: the post-master's option, a direct entry (post-baccalaureate) option, or an accelerated entry (from a master's program) option.

   a. The Post-Master's Entry Option is offered to the student who has excelled academically and plans to continue research and scholarly work in a chosen field. The Graduate School requires that the student meets all general requirements for admission and has a GPA of 3.25 (A = 4.0).
   b. The Direct-Entry (Post-Baccalaureate) Option is offered to the outstanding post-baccalaureate student who has a high potential for independent doctoral level research, has clearly defined professional objectives, and fulfills all the general admission requirements of the doctoral program. To be admitted through the direct-entry option, the student must have the following.
      i. a cumulative undergraduate GPA of 3.25 (A = 4.0)
      ii. undergraduate course work in biology, chemistry, physics, and, mathematics beyond the freshman level and an outstanding score on the Graduate Record Examination (GRE) on (a) the general part, (b) the advanced part in biology, and (c) the advanced part in chemistry, physics, or mathematics.
   c. The Accelerated Entry (from a master's program) Option is designed for a student who makes an early commitment to a doctoral degree. This option may be recommended by the masters student's advisory and research committee after a review of the student's credentials and eligibility has been established. If severe deficiencies in grades or evaluation

are present, however, recommendation for termination may be made. To be eligible for this option, the committee must establish:

i. the student has attained a 3.25 (*A* = 4.0) GPA in graduate course work
ii. the student is prepared and able to conduct research at the doctoral level. This may be done through publications, presentations at meetings and seminars, or preparation and oral presentation of the research proposal.
iii. the student has letters of reference attesting to the student's ability and potential to perform doctoral research.

Upon establishing the student's eligibility, the student's advisory and research committee will prepare a written review of the student's qualifications. Approval of the review must be given by the pharmacology graduate program committee and the chair of the Department of Pharmacology, who will then make recommendation to the Graduate School for waiver of the master's degree or master's equivalency before entry into the doctoral program.

2. The specific course work requirements for the Ph.D. degree will be established by the student's advisory and research committee in accordance with the requirements of the program. The Graduate School requires 24 semester hours of course work before making application to candidacy.
3. The Ph.D. degree may not be conferred less than 6 months nor more than 5 years after admission to candidacy, except upon approval of the dean of the Graduate School. The student is admitted to the Ph.D. degree candidacy after having completed the residency requirement, the research tool requirement, and the comprehensive written preliminary examination.
4. A comprehensive written preliminary examination of course work must be passed with a grade of *B* or better. It will be prepared, conducted, and evaluated by the pharmacology graduate program committee and will be given each fall and spring semester. This examination will become a part of the student's permanent file. The preliminary examination may be repeated only once at least 3 months after the examination. Most course work should be completed prior to this examination, but it should precede the greater part of the dissertation research.
5. Before significant research has begun, a dissertation proposal is required. The dissertation proposal will be presented in a pharmacology seminar. Immediately following this seminar, the proposal will be defended orally before the student's advisory and research committee. The cover sheet for graduate student dissertation proposal must be signed by all members of the student's advisory and research committee and filed with the graduate program director.
6. The dissertation is expected to be a competent, original research project which will make a significant contribution to the body of scientific knowledge. As such, it should be of sufficient quality to merit publication in a peer-reviewed journal. It should include a statement of the problem, an adequate review of literature, a careful analysis of results by whatever methods are appropriate, and an interpretation of the work by a significant source.
7. Admission to candidacy is granted by the dean of the Graduate School upon recommendation of the student's advisory and research committee after the student has fulfilled the residency requirement for the doctoral degree, passed the comprehensive written preliminary examination and met the research tool requirement. The candidate must fulfill all degree requirements within a five-year period after admission to candidacy, or may be required to take another preliminary examination and be admitted to candidacy a second time.

8. After admission to candidacy, the student must complete 24 hours of dissertation credit, (PHRM 600), complete the research and the dissertation document. A student who has completed all formal course work, dissertation and candidacy credit requirements but has not completed and defended the dissertation must register for PHRM 601, Continuing Enrollment, until completion of the degree.
9. A preliminary draft of the dissertation should be given to the adviser at least 10 weeks prior to graduation, a corrected copy should be submitted to other committee members no later than 8 weeks before graduation.
10. Results of the dissertation research must be defended in a pharmacology seminar which must be announced at least one week in advance by sending out proper notice. Immediately following the pharmacology seminar, a final oral examination will be conducted covering the dissertation subject and other discipline related matters. Any member of the University community may attend the final oral examination and may participate in the questioning and discussion, subject to reasonable time limitations imposed by the committee chair. Only members of the committee may vote or make recommendations concerning acceptance of the dissertation and final examination.

    A student will be recommended for the degree if members of the advisory and research committee judge both the dissertation and the performance at the final examination to be satisfactory. Evaluation forms will be completed by the committee. If approved, a dissertation approval form will be completed, signed by the student's major adviser and the chair of the Department of Pharmacology, and submitted to the Graduate School. The examination may be repeated once, at least 3 months after the first examination. Failure of the second examination will result in dismissal from the pharmacology graduate program.
11. It is the student's responsibility to give 2 unbound copies of the dissertation to the Graduate School, along with an abstract of 600 words or less. One bound copy should be given to the graduate program director and to the student's adviser at least 3 weeks prior to graduation. All dissertations will be microfilmed and there is a fee.

REPRESENTATIVE SCHEDULING

Below is a representative schedule of the requirements for the Ph.D. degree in pharmacology. Note that alternative scheduling is available for those students who desire an accelerated entry from a master's degree program, or for those students who already have a Master of Science degree in pharmacology. In addition to the required course work listed below, other electives offered by the pharmacology graduate program include PHRM 565-2, Toxicology; PHRM 560-2, Geriatric Pharmacology; PHRM 590-1 to 24, Readings and Research in Pharmacology.

In Carbondale	Credits
Year 1 — Fall Semester	
PHSL 410a Mammalian Physiology	5
CHEM 451a Biochemistry	3
EPSY 506 Statistics, Inferential	4
Total	12

In Springfield	
Year 1 — Summer Session	
PHRM 551 Methods in Pharmacology	4
Total	4

Year 2 — Fall Semester	
Choose Adviser and Formulate Dissertation Committee	
PHRM 550a Principles of Pharmacology	4
PHRM 550b Principles of Pharmacology	4
PHRM 500 Pharmacology Seminar	1
PHRM 600 Dissertation Research (optional)	3
Total	9–12
*PHRM 555 Cardiovascular Pharmacology	3
*PHRM 574 Neuropharmacology	3
PHRM 500 Pharmacology Seminar	1
PHRM 600 Dissertation Research (optional)	3
*Choice of Two Advanced Courses	
Total	7–10
Year 2 — Summer Session	
Preliminary Exam, The Comprehensive Written Exam of Course Work	
Year 2 — Summer Semester	
PHRM 590 Readings or Research in Pharmacology	3
PHRM 600 Dissertation Research	3
Total	6
Year 3 — Fall Semester	
Dissertation Proposal Defended Orally Admission to Candidacy	
PHRM 600 Dissertation Research	6
PHRM 500 Pharmacology Seminar	1
PHRM 590 Readings or Research in Pharmacology (optional)	3
Year 3 — Spring Semester	
PHRM 600 Dissertation Research	6
PHRM 500 Pharmacology Seminar	1
PHRM 590 Readings or Research in Pharmacology (optional)	3
Total	7–10
Year 3 — Summer Session	
PHRM 600 Dissertation Research	3
Total	3
Year 4 — Fall Semester	
PHRM 600 Dissertation Research	6
PHRM 500 Pharmacology Seminar	1
Total	7
Year 4 — Spring Semester	
PHRM 600 Dissertation Research	6
PHRM 500 Pharmacology Seminar	1
Total	7

SUMMARY OF REQUIREMENTS

Achievement of a grade point average of at least 3.0 (*A* = 4.0)
24 credit hours residency
Completion of research tools required by dissertation committee
Comprehensive written preliminary exam of course work
Admission to candidacy
Oral defense of dissertation proposal
Submission of dissertation to adviser (10 weeks prior to graduation)
Corrected dissertation to dissertation committee (8 weeks prior to graduation)
Completion of an approved dissertation with 24 hours of dissertation credit
Announcement of dissertation defense (1 week prior notice)
Oral defense of dissertation
Submission of approved dissertation to Graduate School (2 copies), graduate program director (1 copy), and adviser (1 copy) 3 weeks prior to graduation

Submission of departmental clearance form
All dissertations shall be microfilmed and a fee is required.

Philosophy

The Department of Philosophy offers a wide range of advanced courses in the major areas within the field leading to the M.A. and Ph.D. degrees. Students are offered a diversified curriculum not dominated by one school of thought or method of approach. The broad range of specializations represented by the faculty exposes students to a variety of aspects of philosophy and at the same time permits them to concentrate on their own particular area of interest. Graduate-level courses in such allied fields as the natural and social sciences, the arts, linguistics, and law offer supplements to the philosophy curriculum.

Graduate courses in philosophy may be used as a minor in programs leading to the Master of Arts or Master of Science in Education degrees. Students who do not plan to continue work in philosophy beyond the master's degree level are encouraged to elect a graduate minor or to combine philosophy with another subject in a 40-hour double major.

All graduate students in philosophy are expected to have some supervised experience in teaching basic work in the field, either through regular teaching assistantships or through special assignments. Opportunities for intern experience at area junior or community colleges are made available.

Admission

Admission to the philosophy graduate program requires the following:

1. An application form to be sent to the department.
2. Official transcripts of each school attended to be sent to the department.
3. A sample of written work, e.g., a term paper written for an undergraduate philosophy class, to be sent to the department's director of graduate studies.
4. Three letters of recommendation from individuals familiar with the student's work should be requested by the applicant to be sent to the department's director of graduate studies.
5. Graduate Record Examination verbal and quantitative scores are requested but not required to be submitted to the department. They are strongly recommended for those applying for fellowships. TOEFL scores of at least 550 are required for all foreign students. These scores should be sent directly to the department. Scores for the Test of Spoken English are strongly recommended for foreign students applying for teaching assistantships.

The department expects an applicant for admission to its graduate program to have had at least 15 semester hours in philosophy or closely related theoretical subjects, including at least one semester in ethics, one in logic, and a year in the history of philosophy. The department may waive a portion of this requirement in favor of maturity and of quality of breadth of academic experience. Applicants will be required to make up serious background deficiencies by taking appropriate undergraduate philosophy courses without credit.

Application for financial assistance is made by filling out a financial assistance form. Applicants for Graduate School and Morris Fellowships should send these applications to the department by February 1 of the academic year preceding that for which application is made. Applications for departmental graduate assistantships should be sent to the department by April 1 of that year.

Entry into the Ph.D. Program. There are three routes by which a student may enter the doctoral program. The standard one is by completion of an M.A. degree

in philosophy at an accredited institution. There are also two alternatives available in special circumstances.

Direct Entry. Direct baccalaureate degree entry into the doctoral program is possible for students who in addition to meeting Graduate School requirements have earned a grade point average of 3.25 or better or have exhibited some other indication of ability to do doctoral-level work in philosophy, such as superior scores on the GRE exam.

Accelerated Entry. After at least one semester in residence, a student enrolled in the M.A. program may petition the department's faculty for accelerated entry into the Ph.D. program. Such entry is permitted only in special circumstances where a student has completed the equivalent of an M.A. degree at another institution or has exhibited some other special qualifications (e.g. papers and publications) for the research or creative activities of doctoral-level study.

Master of Arts Degree

The department's M.A. degree program is designed both for students wishing to continue on for a Ph.D. degree and those who plan to receive a terminal master's degree. For the latter students a minor concentration of up to 9 semester hours outside philosophy is permitted, subject to approval by the director of graduate studies. In order to receive the M.A. degree the student must fulfill the following requirements:

1. Complete 30 semester hours of course work in philosophy or allied fields, 6 of which may be credited toward preparation of a thesis.
2. Demonstrate competence in formal logic during the first year of residence either through appropriate course work or by passing with a grade of *B* or better an examination equivalent to the Philosophy 320 final suitably supplemented with additional materials on Aristotelian logic.
3. Pass an M.A. comprehensive examination on the history of philosophy to be taken no later than in the fall semester of the student's second year of graduate work.
4. Demonstrate reading knowledge of one foreign language, usually French or German, by passing a proficiency examination in that language or by passing the appropriate 488 foreign language course with a grade of *B* or better. This course does not count towards the fulfillment of 1 above.
5. Fulfill a research writing requirement by either: a) writing an M.A. thesis of approximately 50 pages; or b) submitting three edited research papers written in conjunction with graduate seminars. This requirement should normally be met no later than one's second year of residence. The candidate for the M.A. degree will take an oral examination conducted by a three member faculty committee on the research subject.

Doctor of Philosophy Degree

The Ph.D. degree in philosophy is designed to prepare students for college teaching and for research in their field of study. In order to receive the Ph.D. degree the student must fulfill the following requirements:

1. Complete 30 semester hours of course work in philosophy or allied fields beyond the M.A. degree.
2. Demonstrate competence in formal logic during the first year of residence as required for the M.A. degree.
3. Demonstrate a background in the history of philosophy by passing the department's M.A. comprehensive examination on the history of philosophy. Incoming doctoral students will be expected to take this examination within the first year after entering the Ph.D. program.

4. Fulfill a research tool requirement in one of the following ways: a) demonstrating a reading knowledge of two foreign languages by proficiency examination or by passing the appropriate 488 language courses with grades of *B* or better; b) showing an appropriately higher proficiency in one language; or c) demonstrating a reading knowledge of one foreign language and completing satisfactorily at least two courses at the graduate level in an outside area approved by the director of graduate studies. Neither these courses nor the 488 courses referred to in a) count toward the fulfillment of 1 above.
5. Pass a written preliminary examination on the following four areas: metaphysics and philosophy of religion; epistemology and philosophy of science; value studies (ethics, social philosophy, and aesthetics); and an area of historical specialization. This examination will normally be taken only after the student has accumulated at least 24 hours of credit beyond the M.A. degree.
6. Write a doctoral dissertation under the supervision of a faculty dissertation committee. This dissertation is started only after the student has completed 30 hours of course work beyond the M.A. degree and has been admitted to candidacy for the Ph.D. degree. The student's dissertation proposal must first be approved by his dissertation committee. The student must complete at least 24 hours of Philosophy 600 for dissertation hours credit. Upon completion of the dissertation, the student is given an oral examination on it and related topics. Should a student fail to complete the dissertation within five years after admittance to candidacy, the student may be required to take an oral examination (usually administered by the internal members of the dissertation committee) to be admitted to candidacy a second time.

Physical Education

Graduate courses in physical education are offered toward the Master of Science in Education degree with a major in physical education or for the Doctor of Philosophy degree in education with a concentration in physical education. In addition, students may elect courses in physical education to complete requirements for a minor when their program of study allows for a minor.

The minimum number of hours required in physical education at the master's level is 24. The total number of hours required for the master's degree is a minimum of 30 semester hours.

Master's Degree

The departmental requirements for unconditional admission as a master's degree candidate are:

1. Fulfillment of the requirements for admission to the Graduate School.
2. Presentation of an undergraduate course in kinesiology physiology of exercise, human anatomy, motor learning, measurement and evaluation, and at least one in educational psychology or psychology of the particular field of the student's specialty. Appeals may be made within the special program areas.
3. Graduate Record Examination (GRE) scores.

A student may be conditionally admitted to the program and may be permitted to do graduate course work while removing undergraduate deficiencies.

Requests for transfer of credits from other institutions will be considered by the department only before the completion of the first term of enrollment.

Requirements

The following required courses common to all concentrations are PE 500, 503, and either 592 or 599. The courses are designed to provide common experiences to all students regardless of their specialization. For 599 two bound copies are deposited with the department. Two unbound copies are deposited with the Graduate School.

Doctor of Philosophy Degree in Education

The Department of Physical Education participates in the Doctor of Philosophy degree in education with a concentration in physical education. See the description of the Ph.D. degree in education.

Inquiries regarding application should be directed to the chair of the Department of Physical Education.

Physics

The Department of Physics offers graduate work leading to the Master of Arts and Master of Science degrees with a major in physics. Graduate courses in physics may also be taken to satisfy teaching specialty requirements for the Master of Science in Education degree major in secondary education or in higher education.

In addition to the general requirements of the Graduate School, the student must complete PHYS 500A (or mathematics equivalent), 510, 520, and 530. Other specific requirements for the master's degrees are as follows.

Master of Arts

This program is designed primarily for those planning to enter a Ph.D. program. A reading knowledge is required in French, German, or Russian as demonstrated by passing one of the Educational Testing Service's graduate foreign language examinations administered by the testing center of the University's Career Planning and Placement Center or by passing FL 488 with a grade of *A* or *B*.

The M.A. degree major in physics will be granted on the basis of a research paper and 30 semester hours of course work, of which 22 semester hours must be at the 500 level. Each candidate for the M.A. degree is required to earn one credit in PHYS 581 by lecturing in the graduate seminar and is required to pass an examination, written or oral or both, covering graduate work including the research paper. This examination is given by the student's advisory committee.

Master of Science

This program is specifically designed for those who wish a professional degree and do not plan to continue beyond the master's level. A reading knowledge of a foreign language or demonstrated competence of computer skill is required. This requirement can be met by passing one of the Educational Testing Service's graduate foreign language examinations for the language option, or by passing FL 488 with a grade of *A* or *B*, for the language option, or by passing MATH 475a, CS 464a, or an equivalent course in numerical analysis for the computer skills option. English can be substituted for either of the above requirements at the discretion of the graduate adviser provided it is not the native language of the candidate.

A thesis is required, based upon not more than 6 nor less than 3 semester hours of 599-level credit. The 599 credit requirement is in addition to the minimum of 15-hour requirement at the 500 level as stated in this catalog and should be distributed preferably over several terms of enrollment. Each candi-

date for an M.S. degree is required to earn one credit in PHYS 581 by lecturing in the graduate seminar and is required to pass an examination, written or oral or both, covering graduate work including the thesis. This examination is given by the student's advisory committee.

Physiology

Graduate courses in physiology may be taken leading to the Master of Science or the Doctor of Philosophy degrees with a major in physiology. Graduate courses in physiology may also contribute to a program leading to a Master of Science degree major in biological sciences or to a teaching specialty for the Master of Science in Education degree major in secondary education or in higher education.

The Department of Physiology offers advanced training in mammalian physiology, cellular and comparative physiology, endocrinology and pharmacology, biophysics, and human anatomy. Students entering the graduate training program are advised to plan the course work so as to acquire a broad knowledge of the field before emphasizing one of these sub-disciplines. The advisory system in the department is set up to help students in planning their work. All graduate training programs in the department are subject to approval of the graduate training committee of the department.

Each term the student must be engaged in a training assignment which supplements formal course work and will consist of research or teaching or both. The student is required to have participated in both types of activities, research and teaching, as a graduate student at SIUC as a condition for receiving a graduate degree.

Prerequisites for graduate training with a major in physiology usually include the equivalent of an undergraduate major in one of the biological sciences, plus inorganic and organic chemistry and a minimum of one year each of physics and mathematics. Students with undergraduate training in related areas, such as chemistry, physics, mathematics, computer science, psychology, or engineering are strongly encouraged to consider graduate work in physiology; deficiencies in the requirements listed above can be made up early in graduate training.

Master's Degree

To complete the master's degree with a major in physiology, the student must ordinarily have completed a minimum of 30 semester hours of graduate credit. The student is required to pass an oral or written examination over the field of physiology and the thesis topic, and must present an acceptable thesis demonstrating ability to perform high quality research under supervision.

Equivalent work completed at other institutions or in other departments may be substituted for a part of the course requirements for graduate work in physiology.

Master's students are encouraged but not required to attain competence in at least one research tool (computer sciences, statistics, electronics, advanced mathematics, electron microscopy, etc.). Competence may be demonstrated by successful completion of appropriate courses or by private study, as determined by the student's graduate advisory committee. A minor is not required for the master's degree major in physiology; however, a student may elect to obtain a minor in any other intellectual area approved by the department.

Doctoral Program

Students entering the doctoral program major in physiology should present as a minimum the requirements listed above for the master's degree program. In addition, it is strongly recommended that the doctoral student have completed

calculus and physical chemistry. Students with prior training in chemistry, physics, engineering, computer sciences, etc., can usually expect to spend some additional time acquiring the requisite biological sciences background.

For admission to doctoral candidacy, the doctoral student should have completed a reasonably broad spectrum of courses offered by the department, should have acquired a competence in two of the research tools mentioned above, and must have successfully passed a written preliminary examination.

Ordinarily, doctoral students should expect to spend a minimum of three years beyond the bachelor's degree or two years beyond the master's degree, in residence. They will be required to present an acceptable dissertation describing original research performed with minimal supervision and deemed by their graduate committee to be of such quality as to merit publication in the refereed literature of the field. A final oral examination will be held over the field of the dissertation.

Plant Biology

The Department of Plant Biology offers a well-balanced graduate program leading to the degrees of Master of Arts, Master of Science, Master of Science in biological sciences, Master of Science in Education in biological sciences, and the Doctor of Philosophy.

The areas of emphasis are those of the broadly diversified faculty which characterizes the department and faculty members of other departments who participate in joint programs. All areas of plant biology are represented. The departmental master's programs and the doctoral program are based on a combination of course work and research. An advisory committee of faculty members from plant biology and other selected departments is responsible for the degree program of the individual student. At some stage in their overall programs, all students granted a degree will have completed training equivalent to one or more courses in each of six areas of plant biology (morphology, anatomy, taxonomy, genetics, plant physiology, and ecology).

The Department of Plant Biology is housed in modern facilities in the Life Science II building. Each faculty member provides laboratory facilities for the students as part of the research program, and the department provides centralized facilities, including a growth chamber suite, herbarium, greenhouse complex, and field stations. Several University-owned field station facilities are located in southern Illinois, and University-affiliated field programs are carried out in the British Virgin Islands. Excellent cooperative research arrangements are available with other departments for such activities as electron microscopy, chemical analyses, and research photography.

A distinguishing feature of the Department of Plant Biology is its congenial atmosphere. Individuals are encouraged to develop their own programs and research activities within the scope of available resources or those which can reasonably be attained. The first master's degree was granted in 1948, and the first Ph.D. degree in 1965. All areas of plant biology have been represented in the course of the department's history, with some shifts in emphasis according to both changing interests within the scientific disciplines and changes in the faculty and student population.

Graduate degrees in plant biology will be awarded to students in recognition of their ability to do independent research as evidenced by the acceptance of a thesis or dissertation and by the demonstration of competent scholastic ability. Teaching experience in undergraduate courses is expected as part of the Ph.D. degree program.

Admission

Students must be admitted to the Graduate School before they can be considered by the department. All applications to the department must include three letters of recommendation, application form, GRE scores including verbal, quantitative, and advanced biological, and may include a financial assistance form. Criteria for admission include grade point average, letters of recommendation, and availability of faculty, space, and facilities.

Applicants must have completed a course (or equivalent) in each of the following areas (these may be completed concurrently with work toward the degree): (a) general botany, (b) plant diversity (survey of the plant kingdom), (c) plant physiology, (d) plant taxonomy, (e) ecology, (f) genetics, (g) additional requirements for the B.A. degree as specified by the College of Science in the current Undergraduate Catalog of SIUC.

A student deficient in three or fewer of these areas (a through g) must be admitted with conditional standing. A student admitted with conditional standing must make up all deficiencies within the first academic year, and until such deficiencies are completed, no more than ten academic units can be accrued toward the degree. Students lacking four or more of these areas must register as unclassified.

All deficiencies must be made up through the taking of pertinent undergraduate courses for credit with a grade of *B* or better in each.

Students desiring financial assistance should note that the deadlines for fellowship and assistantship applications are February 1 and March 1, respectively. Application forms are available from the director of graduate studies in the Department of Plant Biology.

Advisement

Following admission to the department and before registration for course work, the student must consult a staff member representing the field of major interest or, if this is unknown, the director of graduate studies of the department, for assistance in planning first registration. At every registration, deficiencies and specific departmental requirements must be considered first. Any changes in registration must be approved by the student's adviser.

Within the first six months of admission into the departmental program, the student must select a faculty member who is willing to serve as the major adviser. The major adviser in consultation with the student, the director of graduate studies, and the departmental executive officer will then select an advisory committee with the major adviser as chair. For the master's degree program, a minimum of three people shall make up the advisory committee. At least half of the committee must be comprised of members of the plant biology faculty. The advisory committee for the Ph.D. degree program will be composed of at least five people, three of which must be botanists and one which must be from outside the department.

Following establishment of the advisory committee and before advance registration for the third term, the student will meet with the committee to discuss the program of courses for the degree and plans for research. In this regard, the committee is empowered to require work in fields with which the student's interests are allied. The advisory committee will advise the student on the selection of readings on general and historical topics of importance which may not be encountered in formal courses. Copies of the approved program of courses and the plans for research must be placed in the departmental files.

Research and Training Assignments. Research is required of each student in the program. In addition, each term the student must be engaged in a training assignment which supplements formal course work by professional activities such

as research or teaching. The assignment varies according to the needs, professional goals, and competencies of the student, and increases in responsibility as the student progresses. The assignments require from ten to twenty hours of service per week.

Academic Retention

The general regulations of the Graduate School with respect to academic retention shall be followed. In addition, no course in which the grade is below *C* shall count toward the degree or fulfillment of any requirement, but the grade will be included in the grade point average. No more than five hours of *C* work in graduate courses will count toward the degree.

All students are subject to regular review by the department's graduate policies committee. Those not attaining the minimum acceptable academic standards or who in any way fail to meet any other scheduled requirements or standards will be dropped as majors.

Course Requirements

All master's degree students must earn a minimum of 2 hours credit in plant biology seminars (PLB 580 or PLB 589), at least one of which must be in general seminar (PLB 580). All Ph.D. students must earn 2 hours credit in plant biology seminar (PLB 580 or PLB 589) every year of residence until admitted to candidacy and at least 1 credit each year must be in general seminar (PLB 580). It is strongly recommended that the student enroll in general seminars dealing with subjects other than the general area of emphasis being pursued. Attendance in general seminar (with or without credit) during every semester is strongly recommended.

Those students who have not already taken a course in plant anatomy must include PLB 400-4 Plant Anatomy in their graduate degree program.

Appeals

Appeals for variations from the departmental graduate program must be presented in writing to the plant biology graduate faculty meeting as a committee of the whole. Appeals must receive approval from a majority of the total plant biology graduate faculty.

Appeals for changes in the student's graduate advisory committee or changes in the original program must be approved in the following order: (1) approval from adviser, (2) approval from remaining members of the student's advisory committee.

Student appeals for change of major adviser must be presented in writing to the plant biology graduate faculty meeting as a committee of the whole. Appeals must receive approval from a majority of the total plant biology graduate faculty.

The Master's Degree

A minimum of 30 hours of graduate credit is required beyond the bachelor's degree, including no less than 22 hours of plant biology courses, 9 of which may be individualized instruction courses, including up to 3 (minimum of 2) hours of seminar, and up to 6 (minimum of 3) hours of thesis. A graduate minor of at least 10 graduate hours may or may not be required; this is to be determined by the student and the advisory committee. The M.A. degree requires an additional minimum of passing ETS examination in a foreign language or taking the appropriate 388 and 488 course and earning a grade of *B* or better in each. At the time of completion of the thesis, the student must schedule a public presentation of the thesis material (this is in addition to the comprehensive examination).

The Ph.D. Degree

Courses. The major shall consist of a minimum of 20 semester hours at the 400 and 500 levels in formal plant biology course work beyond the master's degree but excludes seminar, readings, research, dissertation, and research tool requirements.

The decision as to whether a minor shall or shall not be required shall be left to the student's advisory committee. If the committee requires a minor, it will determine the specifications of that minor.

The student shall demonstrate knowledge in each of the two foreign languages by passing an Educational Testing Service examination or taking the appropriate 388 and 488 course and earning a grade of *B* or better in each. The ETS passing level for French and German shall be 465 and the ETS passing level for Russian and Spanish shall be 440. Proficiency in (a) statistics, (b) computer programming, or (c) scientific photography and scientific illustration may be required in lieu of one of the languages or in addition to the languages if the advisory committee so rules. A research tool to be substituted for one language must be completed utilizing formal courses consisting of at least two terms (at least 6 hours) with an average grade of *B* or better. Courses used to satisfy the requirement shall not be applied toward the total number of hours required for the degree.

Preliminary Examination. The student's advisory committee shall serve as the preliminary examination committee and shall prepare and administer the examination which will be both written and oral.

The written examination will be taken first and will cover the candidate's knowledge of plant biology and related fields and their history, the student's accomplishments in the course of study outlined, and the student's progress in the special field. The candidates will be expected to show an understanding of the application of their formal work to their field of research. The written examination will consist of three parts: the first will include questions in the student's special field of interest, the second will include questions testing basic knowledge in plant biology, and the third will include questions in the student's outside minor field or secondary concentration within plant biology.

The entire written examination is to last no longer than five days and each part is to last no longer than eight hours. The student must pass all parts of the written to proceed to the oral examination. Pass means sufficient information is evident to permit the student to proceed to the oral part of the examination.

In order to pass the written examination, the vote of the advisory committee will determine (by majority vote) whether the student will be allowed to continue in the program and whether the student will be required to retake part or all of the written examination. Upon failing the written examination, the student may not retake the examination in the same academic term. In any event, the student must pass the written examination by the third attempt in order to continue in the doctoral program.

The oral examination will be taken no sooner than ten days nor later than thirty days following the passing of the written examination. The examination shall last at least two hours and no more than four hours and should be scheduled to allow attendance of a maximum number of the plant biology graduate faculty and all of the advisory committee members. The student's answers to the written examination will be made available to the graduate faculty in plant biology (upon request) prior to the oral part of the preliminary examination. All attending graduate faculty members will be given the opportunity to express their opinion on the examination. Passage of the oral examination must be by unanimous vote of the advisory committee and may have conditions.

Final Examination. The final examination will be oral. It shall be held at least one month before graduation and shall last for no more than three hours. It is to cover the dissertation and related subject matter. The advisory committee must notify the graduate adviser of its recommendation for the date of the final examination at least two weeks before the examination.

Passage of the final oral examination should be construed to mean that there be no more than one dissenting vote of the advisory committee. In the event of failure, a second examination may be held as directed by the advisory committee.

Plant and Soil Science

The Department of Plant and Soil Science offers programs of study leading to the Master of Science degree with a major in plant and soil science with concentrations in the areas of crop, soil, and horticultural sciences; an emphasis in environmental studies in agriculture is also available in each of these concentrations. Supporting courses in plant biology, microbiology, chemistry, statistics, and other areas essential to research in the student's chosen field may be selected. Supporting courses are selected on an individual basis by the student and the advisory committee. Once the general field has been selected, the research and thesis may be completed in any one of the many divisions of that field. In field crops, the research may be directed toward crop production and management, weeds and pest control, or plant breeding and genetics; in horticulture, the research and thesis may be in landscape design, vegetables, tree-fruits, small-fruits, floricultural and ornamental plants, plant tissue culture, or turf management; in soils, the research may relate to soil fertility, soil physics, soil microbiology, soil chemistry, or soil and water conservation; in environmental studies, the research may be directed toward sound pollution, water pollution, reclamation of strip-mined soil, or agricultural chemical pollution problems. Often two of these more restricted areas can be combined in one thesis problem.

Students interested in plant and soil science at the doctoral level can be admitted to a program of study leading to the Ph.D. degree in plant biology. The program, which is administered by the Graduate School through the Department of Plant Biology, is adequately flexible to allow students to explore such interests as plant physiology, plant nutrition, chemical control of plant growth, plant genetics, etc.

Admission

Application for admission to graduate study in the department should be directed to the Graduate School. The applicant must have the registrar of each college previously attended send an official transcript directly to the Graduate School. In addition applicants should send a letter directly to the chair of the Department of Plant and Soil Science expressing their professional and personal career objectives. Applicants should also request that four persons who can evaluate the student's academic ability write letters directly to the chair in their behalf. Final admission to the program and a particular concentration administered by the Department of Plant and Soil Science is made by the department. Minimal admission requirements to the program are: a) completion of the plant and soil science undergraduate requirements and b) a minimal grade point average of 2.7 ($A = 4.0$). The students who do not meet the requirement of completing the required courses in the undergraduate program in plant and soil science may apply to enroll as unclassified students to make up these deficiencies. Undergraduate course work taken to correct these deficiencies will not apply to the minimum requirements for the master's degree. Students entering the plant and

soil science graduate program with a GPA below 2.70 are accepted on a conditional basis and must enroll in 12 hours of structured courses at the 400–500 level and make a GPA of 3.0 or be suspended from the program.

Program Requirements

Minimum requirements for the master's degree may be fulfilled by satisfactory completion of 30 semester hours of graduate credit. Of the 15 hours required at the 500 level, no more than 10 credit hours of unstructured courses may be counted toward the degree. If the student writes a thesis, 15 semester hours (which may include thesis credits) must be in plant and soil science courses; if the student submits a research paper (non-thesis option), 20 semester hours must be in plant and soil science courses. There is no foreign language requirement.

Each student, whether in the thesis or non-thesis option will be assigned a mutually agreed upon major professor to direct the program. The major professor will serve as chair of the student's advisory committee which will consist of at least three members from within the department and one member from another department. Each master's degree candidate must pass a comprehensive oral examination covering graduate work including the thesis or research paper.

Political Science

The Department of Political Science endeavors to accommodate the special and general interests of students through a broad curriculum, individualized programs, and varied teaching and research assistantships. The department takes a personal interest in its students throughout their period of enrollment and assists them in finding satisfying professional employment upon graduation. Graduates now hold academic appointments in 60 American universities and colleges and more than a dozen foreign institutions of higher education. Graduates are also employed in various governmental agencies at the national, state, and local level.

The professional interests of the faculty range across all fields of political science, and have resulted in significant scholarly publications and presentations at professional meetings.

Graduate programs in the Department of Political Science may be designed to lead to Master of Arts and Doctor of Philosophy degrees with a major in political science, and a Master of Public Affairs degree. Graduate work in political science may be taken to satisfy requirements for a teaching specialty for the Master of Science in Education degree with a major in either secondary education or higher education. Graduate work in political science may also serve as a cognate field for a student majoring in another discipline.

Provisions of this publication are supplemented by policies made explicit in the regulations and procedures of the graduate studies program of the Department of Political Science and made available to all graduate students.

Application Procedures

Application for admission to graduate study in political science and all post-secondary education transcripts should be directed to the Graduate School. Other application materials should be sent to the director of graduate studies, Department of Political Science. These materials consist of (1) three letters of recommendation from persons who can evaluate the applicant's academic ability; (2) a careful explanation of reasons for seeking graduate study; and (3) scores on the Graduate Record Examination (GRE) verbal and quantitative tests. Foreign students applying from abroad are not required to submit GRE scores, but are advised to do so if they are applying for financial assistance. Foreign students

must have taken the test of English as a foreign language (TOEFL) and passed the examination with a score of at least 550. In exceptional cases the GRE may be waived as an admission requirement, but it must be taken at the first offering of the examination after the student enters the program. Application material, including instructions for applying for financial assistance, may be obtained from the director of graduate studies, Department of Political Science. Applications and supporting materials should be submitted at least four weeks before the term of registration. Those applying for graduate assistantships or fellowships should complete their applications by February 1.

Master of Arts Degree Requirements

Admission. Applicants for the Master of Arts degree program are admitted only with the approval of the graduate studies committee of the department. The department imposes requirements for admission in addition to those of the Graduate School. The department will ordinarily accept as candidates for the Master of Arts degree only those applicants who (1) have graduated from an accredited four year college or university; (2) have completed a minimum of 24 quarter or 16 semester hours in government or political science; (3) have a 2.7 (4-point scale) overall grade point average or, alternatively, have a 2.9 overall grade point average for the last two years of undergraduate work; and (4) have a 3.0 average in government or political science.

Retention. Retention is governed by the rules of the Graduate School. Students should avoid the accumulation of incomplete grades. No student with more than two incomplete grades can be awarded a graduate student appointment, and a student holding a graduate student appointment is subject to having the appointment terminated upon acquiring two or more incomplete grades.

Course Work. The director of graduate studies serves as adviser to each M.A. student until an advisory committee has been selected by the student with the approval of the director, normally no later than the middle of the student's first semester in residence. The advisory committee must approve the student's program. The student must earn a minimum of 30 semester hours of acceptable graduate credit to qualify for the Master of Arts degree. A maximum of 12 hours can be earned in 400-level courses. A minimum of 6 semester hours must be completed in each of three of the areas of emphasis listed under the Ph.D. requirements. M.A. candidates must complete pro-seminars in at least two of the three areas of emphasis offered by the student for examination except in cases of cognate fields that do not stipulate pro-seminar requirements. The selection of areas of emphasis must be approved by the student's advisory committee.

The student who completes the minimum of 30 semester hours of course work may devote no more than 6 of those hours to courses taken outside of the department unless the work is in an approved cognate area. In the latter case, a maximum of 12 hours in the cognate area may be counted toward the fulfillment of area and degree requirements.

Each candidate for the Master of Arts degree must complete POLS 500. Proficiency in one research tool complementing the selected areas of emphasis is also required, i.e., statistics, data management, or foreign language. Methods of demonstrating proficiency are the same as those required of Ph.D. students. A student may count a maximum of 6 semester hours of 400- or 500-level tool course work toward partial completion of degree requirements, provided that (1) no more than 6 semester hours of an approved cognate area are counted as part of the 30 semester hours and (2) the tool courses are not counted as fulfilling one of the area requirements.

Thesis. In addition to the required course work, the student must submit a thesis. A student may receive a maximum of 6 hours credit for the thesis. Before registering for thesis credit, the student must have an overall GPA in M.A. work of at least 3.0 ($A = 4.0$) and must have completed the research tool requirement and selected a thesis committee approved by the director of graduate studies. The membership of the advisory committee and the thesis committee will normally be different from that of the advisory committee. A prospectus outlining the research proposed for the thesis must be approved by the members of the thesis committee and filed with the director of graduate studies.

A final oral examination conducted by the appropriate committee and open to the public will cover the thesis and the student's general competence in political science. A student may not take the examination if there are any incomplete grades on record except by petition to the graduate studies committee. If the student fails the examination or if the thesis is rejected, the student may be dropped from the department's degree program or may submit a new or revised thesis or repeat the examination at the discretion of the examining committee.

Copies of the thesis should be submitted to the student's thesis committee members no later than one week before the scheduled final oral examination. A copy of the approved thesis must be filed with the director of graduate studies.

Exceptions. An exception from these rules must be justified in a petition approved and signed by the student's committee members, submitted to the director of graduate studies and approved by the members of the graduate studies committee at a scheduled meeting.

Master of Public Affairs Degree Requirements

Admission. Students are admitted to either pre-entry or mid-career status. To be admitted as a mid-career student, the student must have at least one year of professional experience in a public or quasi-public agency. Students having less than one year of professional experience are admitted to pre-entry status.

Applications for admission should be directed to the Graduate School and the director, Master of Public Affairs degree program, Department of Political Science. To be considered for admission, applicants must have: (1) graduated from an accredited four-year college or university and (2) received an overall grade point average of 2.7 (4.0 scale) or, alternatively, a 2.9 overall grade point average for the last two years of undergraduate work. In instances where a candidate's promise is indicated by professional experience rather than undergraduate record, consideration will be given on an individual basis to admission or conditional admission. Retention is governed by the standards of the Graduate School.

Degree Requirements. M.P.A. students complete a 42 semester hour program of study, as follows: (1) a 5-course core curriculum, totaling 15 credit hours, with a minimum of 2.8 grade point average, (2) 18 credit hours of elective course work, 6 of which must be earned in graduate level courses in the Department of Political Science, (3) a research paper in public affairs, for which 3 credit hours are awarded, (4) an oral examination, and (5) an internship, for which 6 credit hours are earned. Of the 33 hours of graduate level course work, at least 18 credit hours must be taken in the Department of Political Science. Each of these requirements is described more fully below.

Prerequisites. Students lacking undergraduate preparation in American government and public administration must complete GSB 212 and POLS 340 during their first semester of study. Exceptions to this may be granted to mid-career students, on a case-by-case basis. Competence in statistics is required before en-

rollment in certain core courses and may be demonstrated by completion of an appropriate graduate level course, or, on occasion, by previous undergraduate course work.

The Core Curriculum. The core curriculum consists of the following five courses.
POLS 540-3 Environment of Public Administration
POLS 542-3 Public Budgeting and Fiscal Management
POLS 543-3 Public Personnel Management
POLS 544-3 Program Analysis and Evaluation
POLS 545-3 Organization Theory and Behavior

To facilitate the work of part-time (employed) students, each of the core courses is offered in the evening at least once every three years. A substitution for one core course may be allowed if the substituted course is similar in content to the particular core course or if competence in the subject matter of the course is clearly evident.

Electives. Elective courses may be selected from the offerings of various departments across the University, as well as those of the Department of Political Science. The student and the faculty adviser consult in selecting courses best suited to the student's individual career goals, which may be either specific or general in nature.

The Research Report. The research report is to be an examination of some issue or problem in public administration. It may be either theoretical or applied, or some combination of theoretical and applied concerns. Early preparation for the research project and related report begins during the student's first semester of study, and completion is normally a prerequisite for internship placement. The report is written under the supervision of the student's faculty committee.

The Oral Examination. After completion of course work and the research report, an oral examination is scheduled and conducted by the student's faculty committee. The examination gives attention to course work as well as the methodology and findings of the research report. After satisfactory performance in the oral examination, a copy of the approved research report must be filed with the Graduate School and program director. Students who fail the examination are allowed a second examination after remedial work as recommended by the committee. Candidates who fail more than once are dropped from the program.

The Internship. Pre-entry students must serve an internship in a governmental agency, unless a substitution as described below is made. The internship is usually for 4.5 months of full-time work or 9 months of half-time work, and it provides a stipend as negotiated by representatives of the program and agency. The internship is normally scheduled to begin after course work and the research report have been completed. Mid-career students receive credit for the internship on the basis of previous professional experience and submission of a paper as specified in program guidelines.

The student may substitute 6 semester hours of course work for the internship if a request is approved by the program director or if an appropriate internship is not available.

M.P.A. AVIATION ADMINISTRATION CONCENTRATION

To be considered for admission, pre-entry applicants will need to have graduated from an accredited four year college or university with a major in some aspect of aviation, and normally have either a grade point average of 2.7 (4.0 scale) or, alternatively, a 2.9 for the last two undergraduate years. Mid-career applicants with strong professional experience may be admitted with grade point averages

below these levels and with undergraduate majors outside the aviation field. Undergraduate coursework and letters of recommendation will also be considered in admission decisions.

Prerequisites in American government, public administration and statistics for aviation concentration students are the same as for other M.P.A. students. In addition, aviation concentration students lacking undergraduate preparation in aviation management must complete a basic aviation management course.

All degree requirements for the M.P.A. program also apply to the aviation administration concentration. However, students in the aviation concentration will be required to take three of the four courses in Aviation Policy and Administration and one of the five courses in Quantitative Techniques for Decision Making, listed below. This additional curriculum of four courses (12 semester hours) reduces the electives available to aviation concentration students to 6 semester hours, instead of 18 semester hours of electives available to other M.P.A. students.

Aviation Policy and Administration
POLS 551 Aviation Policy and Planning
POLS 552 Advanced Airport Administration
POLS 553 Advanced Aviation Safety Administration
POLS 554 Aviation Law and Regulation
Quantitative Techniques for Decision Making
POLS 444 Public Policy Analysis
POLS 547A Topical Seminar in Public Administration (Tools and Techniques)
BA 452 Operations Research
BA 560 Management Information Systems
BA 572 Forecasting and Decision Making Models

It is expected that students in the aviation administration concentration will write their required master's research report on an administrative issue or problem in the aviation field. Pre-entry students in the concentration would be placed only in an aviation organization for their internship.

Concurrent Degrees in Law and Public Affairs

Students who have been admitted separately to the Southern Illinois University School of Law and graduate program in public affairs may study concurrently for the Juris Doctor and Master of Public Affairs degrees. Students interested in concurrent study should inform both programs before entering the second academic year of either program and will register as law students with a minor in public affairs. Each program will maintain records and evaluate final degree requirements as if the student were enrolled in only one program.

Concurrent study students must complete a minimum of 81 semester hours of School of Law credits which meet all law area requirements, as well as all M.P.A. requirements to receive the J.D. degree. Students will not be permitted to take course work outside the prescribed law curriculum during the first year of law classwork. Students may enroll for both law and graduate course work during subsequent years provided a minimum of 10 semester hours of law and 12 semester hours total are taken in any term which has law course enrollment.

Concurrent study students must complete a minimum of 42 semester hours which meet the distribution requirements of the M.P.A. program to receive the M.P.A. degree. A maximum of 6 semester hours of School of Law credits of a public affairs nature (for example administrative law, environmental law, labor law, natural resources law) may be applied to both J.D. and M.P.A. requirements if approved by the director of the M.P.A. program. All concurrent study students will complete either the M.P.A. internship experience and project, or the applied study project. Internships will normally be scheduled during the third or fourth year of concurrent study.

Doctor of Philosophy Degree Requirements

Admission. Applicants for the doctoral degree are admitted only with the approval of the graduate studies committee of the department. In addition to Graduate School and other departmental requirements, the committee ordinarily requires a grade point average of 3.5 (4-point scale) in graduate-level work and adequate background in political science. Admission is also possible through the accelerated entry option (see below) as well as direct entry from baccalaureate programs in those instances where the graduate studies committee identifies high achievement and potential in an applicant's undergraduate work. Applicants for direct entry should contact the director of graduate studies, Department of Political Science, for the most recent departmental regulations and procedures governing admission under this option.

Retention. Retention is governed by the rules of the Graduate School. Students should avoid accumulating incomplete grades. Students holding graduate assistant appointments are expected to make reasonable progress toward a degree. No student with more than two incomplete grades can be awarded a graduate assistant appointment, and a student holding a graduate assistant appointment is subject to having the appointment terminated upon acquiring two or more incomplete grades.

Accelerated Entry into the Ph.D. Degree Program. A student enrolled in the M.A. degree program may petition the graduate studies committee after two semesters in residence for waiver of the requirement of an M.A. degree as prerequisite for admission to the doctoral program, and for direct entry to the Ph.D. degree program in accordance with the following conditions. First, the student must be certified by the advisory committee to be an outstanding graduate student. In so doing, the committee must consider a wide range of supporting evidence including but not restricted to GPA, GRE, M.A. degree tool requirement, and evaluative letters from all graduate instructors from whom the student has taken courses. Second, the student must present one graduate research paper of outstanding quality or a published article of appropriate character and quality. The petition accompanied by the advisory committee recommendation and the supporting evidence must be presented to the graduate studies committee which will make the final decision on the petition. If admitted, the student will proceed toward the Ph.D. degree in accordance with the established rules of the department and Graduate School.

Direct Entry into the Ph.D. Degree Program. Students admitted under the direct entry option are required to fulfill M.A. degree method, tool, and course work requirements as part of the Ph.D. degree work. Additional measures of progress may be required by the student's advisory committee.

Program of Study. The work of a Ph.D. student is directed toward admission to candidacy for the doctorate, for which the student must meet the residency requirement, meet course, methods, and research tool requirements, maintain a GPA of at least 3.5, and pass preliminary examinations in four areas of emphasis.

The student must be in residence for at least one year (two semesters in each of which the student completes at least 9 hours or 6 hours if the student holds a graduate assistantship) after admission to the Ph.D. program before preliminary examinations can be taken. Residence shall be counted from the time the student passes the final examinations for the master's degree or, in cases of accelerated entry or direct post-baccalaureate entry to the Ph.D. degree program, when the

student has met all graduate school and departmental requirements pertaining to those options.

The student's program must be approved by an advisory committee selected by the student and approved by the director of graduate studies. The members of the advisory committee should represent the student's areas of emphasis.

The student prepares in four areas of emphasis, in three of which written examinations and an oral examination must be passed. In the examination areas, 9 hours of course work at the graduate level must be completed, including the appropriate pro-seminar in each area; not more than 3 hours of readings or individual research may be counted in the 9 hours for each area. In the non-examination fourth area, the appropriate pro-seminar and 3 more hours (which cannot be readings or individual research) are required. The areas of emphasis are: political theory; methodology; American government and politics; public law; public administration and policy analysis; comparative government and politics; international relations, law, and organization; a cognate or interdisciplinary field.

The student must also complete the requirements for two research tools (see below) and the specialized research methods course best complementing the student's areas of study. The student's advisory committee may require additional course work, in or out of the areas of examination. The student, before enrolling in POLS 590, Readings or POLS 591, Individual Research, must have completed the appropriate pro-seminar for the area in which readings or individual research is to be done. At least half of all course work must be in 500 level courses.

Research Tools and Methods. The Ph.D. is a research degree, and students must acquire knowledge of research tools and methods.

1. Research tools: statistics, data management, foreign language. All Ph.D. students must satisfy a statistics requirement by successfully completing EPSY 506 and 507 or another statistics sequence approved by the graduate studies committee. Students must also satisfy one additional tool requirement. A data management tool may be satisfied by POLS 503a or b. A foreign language tool may be satisfied by a minimum score of 465 on the ETS examination or by successful completion of a 488 course in the Department of Foreign Languages and Literatures. A special examination approved by the graduate studies committee may be offered for a language not covered by ETS or the Department of Foreign Languages.

   Students whose native language is not English may offer English to satisfy the additional tool requirement.
2. Methods of research.
   a. POLS 500 is a general methodology course. It is required of M.A. students and of Ph.D. students who have not had a comparable graduate level methodology course.
   b. Specialized methods of research. Students are required to complete successfully one specialized methods course, chosen from the POLS 501 sequence or another appropriate course, such as EPSY 508 or 531, HIST 492, PSYCH 522a or b or 527, or SOC 513. The course selected should be the one most appropriate to the student's primary area of emphasis.

This department is amenable to self-tailored programs subject to the expertise of the faculty and the approval of the graduate studies committee. Such approved programs may suggest the need for tools in addition to or in place of those tools specified in this section.

Preliminary Examinations. Before preliminary examinations can be scheduled a student must have completed all course work, two research tools, and a specialized methodology course, have a grade point average of at least 3.5, and have had a preliminary examination committee approved by the director of

graduate studies. Students may not take preliminary examinations if there are any incomplete grades on their records except by petition to the graduate studies committee.

The three written preliminary examinations are to be completed within a period of ten days; an oral examination follows within one week of the last written examination upon the approval of the examination committee. A student who passes the written and oral examinations is advanced to candidacy for the Ph.D. degree; a student who does not pass the examinations may be permitted to retake them at a later date or be dropped from the degree program of the department, at the discretion of the advisory committee and the graduate studies committee.

Dissertation. A dissertation must be written under the direction of and with the approval of a five member committee, one of whom must be from outside the Department of Political Science. The membership of the dissertation committee will normally be different from that of the advisory committee. A dissertation prospectus must be approved by the members of the dissertation committee and filed with the director of graduate studies. Students must register for a minimum of 24 hours of dissertation credit, POLS 600, and cannot register for dissertation credit until they have been admitted to candidacy or, with the approval of the advisory committee and the director of graduate studies, until the term during which preliminary examinations are scheduled.

An acceptable dissertation must be completed within five years after admission to candidacy, or the student will have to repeat preliminary examinations. Final copies of the dissertation should be submitted to the members of the dissertation committee no later than ten days before the scheduled oral examination. The success of a final oral examination devoted primarily to a defense of the dissertation and open to the public will complete the requirements for the Doctor of Philosophy degree. A final copy of the dissertation must be filed with the director of graduate studies.

Cooperative Program with Sangamon State University

The Department of Political Science at SIUC has an agreement with the political studies program at Sangamon State University in Springfield to facilitate the entry of SSU political studies students into the SIUC political science Ph.D. degree program. SIUC will accept appropriate SSU graduate credits to fulfill course work, methodology, and research tool requirements. SSU students can qualify for accelerated entry into the SIUC doctoral program after two semesters of study at SSU with 24 semester hours completed, a 3.5 GPA, two proseminars, and written evaluations from course instructors. A number of SSU faculty are eligible to serve on graduate student examination and dissertation committees. SIUC will accept up to 12 hours credit for course work, research projects, and internships completed under SSU faculty direction towards the SIUC political science Ph.D. degree. Other course work, residency, and dissertation requirements of the SIUC program must be met as described in other sections of this catalog. For more detailed information, ask the director of graduate studies, Department of Political Science, SIUC.

Application of Rules and Exceptions. The department's rules in force at the time of the student's admission to the Ph.D. program will apply while the student is in the program unless (1) the student voluntarily selects a newer set of rules in toto before graduation or (2) the time between admission to the Ph.D. program and passing the preliminary examinations exceeds five years. In the latter case, the student will automatically come under the rules in force at the beginning of the sixth year and every fifth year thereafter until the preliminary examinations are passed.

Requests for exceptions to any of the above requirements must be presented in a petition approved and signed by the members of the student's committee, submitted to the director of graduate studies, and approved at a scheduled meeting of the graduate studies committee.

Psychology

The Department of Psychology offers graduate work leading to the Master of Arts, Master of Science, and Doctor of Philosophy degrees with a major in psychology with concentrations in the following areas: experimental, clinical, and counseling psychology. The primary emphasis is on doctoral training, for which the master's degree is a prerequisite.

The goal of graduate study in the Department of Psychology at SIUC is to develop psychologists who will have a broad perspective and scientific sophistication as well as the requisite skills to advance the field of psychology and meet changing needs. The program emphasizes formal course work in the core curriculum and in the concentrations, preprofessional activities in training assignments, research, and practicum opportunities.

Admission and Advisement

Separate application forms must be submitted to the Department of Psychology and to the Graduate School. Graduate School and departmental application forms may be obtained from the Department of Psychology. Separate forms are not required for application for financial assistance, except for Graduate School fellowships. Students will be accepted for graduate work in psychology only upon approval by the departmental admissions committee as well as the Graduate School. Evaluations of applicants by the departmental admissions committee are based on information from the application form, GRE scores, transcripts, and letters of recommendation.

Upon admission to the department, each student is assigned to a faculty adviser, who assists in academic matters, including the planning of the student's program of study: required courses, planned electives, anticipated dates for fulfillment of specified requirements, etc.

A new adviser may be assigned to a student for two reasons: (a) the student or adviser may request a change of adviser; (b) the student may change to a different major area. Requests for a change of adviser should be made in writing to the student's major area committee. To change majors, the student should petition the area subcommittee of the new major.

Core Curriculum

During the first year all students are required to take a two course sequence in quantitative methods and research design (522a and b, or the equivalent). All students enrolled in the master's degree program should have completed the thesis requirement (599, 4–6 hours) by the end of the second year. Six additional elective courses in areas other than the major are required in order to provide breadth as well as some degree of depth in the total field of psychology. The student selects electives in consultation with the adviser. Those in the experimental program select from the following areas, subject to the approval of the faculty teaching in those areas: applied experimental, biopsychology, learning or any other area in the department or an approved area outside the department. Students in the clinical and counseling programs meet this requirement by selecting courses from the above area with the stipulation that, at minimum, the distribution of courses meet the American Psychological Association accreditation requirements.

Psychology 409 is required for all students who have not completed a course in the history and systems of psychology.

Areas of Concentration

EXPERIMENTAL PSYCHOLOGY CONCENTRATION

The experimental psychology program provides students with thorough education and training in the theoretical and research methods applicable to the study of behavior. The program is designed to enable students to pursue a variety of career paths in teaching, research, and applied research in academic or nonacademic settings. The student is expected to emphasize at least one of the three areas of experimental psychology: applied experimental psychology, biopsychology, or learning. In addition to general departmental requirements, students in the experimental psychology concentration are required to take a course in computer programming and must register for research credit (593, 594a, 599, or 600) during all but the first two semesters of residence. As an integral part of their training, students are expected to become active participants in one or more ongoing faculty research programs.

In addition, students in applied experimental psychology must take the following courses: 564, 569, 571, 594a, three additional courses in research methodology, and an additional course in a computer programming language. PSYCH 571 should be taken during the first two semesters in residence, and 569 during the second, third, and fourth years. Students in biopsychology must take 514, an approved course in neuroanatomy, and six additional courses distributed in two different areas. One of these areas must be either physiological or developmental psychology. The second area can be either physiological, developmental, or some other approved area such as learning and memory, sensation and perception, or cognition and language. Students in learning must take 510, 511, and at least one of the following courses: 407, 411, 515, and 520. Additional courses and topical seminars, as approved by the student's advisory committee, complete the requirements.

CLINICAL PSYCHOLOGY CONCENTRATION

The clinical psychology program, approved by the Education and Training Board of the American Psychological Association, is designed to develop clinical psychologists for careers in clinical service, teaching, and research. All clinical students take the core of courses and receive early and continued practicum training in both clinical activities and research. Individual interests are accommodated through electives and training assignments and through specialty programs. The following courses are required of all clinical students: 432, 523, 530a and b, 531, 535, 540, 594e, 598.

In addition to the clinical core students take a minimum of six additional courses in their emphasis: (1) general clinical students are required to take an assessment practicum and an additional semester of therapy practicum plus four electives; (2) the experimental clinical students are expected in their six additional courses to take those which have a research orientation, e.g., 532, 533, 539, etc.; in addition, except when enrolled for thesis or dissertation hours, the student is expected to be involved in research each term after the first year; (3) students in the child clinical emphasis are required to take 556 plus five electives. In addition it is expected that they will take 552 and 554 as a part of departmental electives.

COUNSELING PSYCHOLOGY CONCENTRATION

The counseling psychology program, approved by the Education and Training Board of the American Psychological Association, is designed to teach students a wide range of skills which will prepare them to function as scientist-practitioners. Graduates are qualified for employment in a university setting (either in an

academic department or a counseling center), in hospitals, community agencies, and educational and correctional institutions. The student is expected to develop competence in counseling, psychological assessment, consultation, research, and teaching. The required courses are as follows: 526, 536, 538, 540, 547, 548, 558, 585, 594f, and 598.

Research, Practicum, and Training Assignments

Research or practica are required in each area of concentration. In addition, each term the student must be engaged in a training assignment which supplements formal course work by professional activities such as research, teaching, or clinical service. The assignment varies according to the needs, professional goals, and competencies of the student, and increases in responsibility as the student progresses. The assignments require from 10 to 20 hours of service per week. This is a degree requirement of all students each term and is independent of any financial support. Therefore, each term the student signs up for one hour of 597.

Master's Degree Requirements

The master's degree requires a minimum of 48 semester hours of acceptable graduate credit, distributed according to the requirements of the student's major area, and the completion of an approved thesis. The master's thesis may be either original research or the replication of an important study. The master's degree is a prerequisite for the doctorate.

Doctoral Requirements

Admission. Admission to the Ph.D. program requires a master's degree, a grade point average of 3.25 or above in graduate studies, and acceptance by the department. A student who receives the master's degree from SIUC must apply formally to the Graduate School for admission to doctoral-level study, and be approved by the department chair.

Records of students entering the program with a master's degree from another institution are evaluated by the departmental admissions committee which notes deficiencies, recommends methods for removing them, and specifies a time limit to do so. Such deficiencies must be removed before the student can be classified as a Ph.D. candidate. The student is recommended to the graduate dean for admission to Ph.D. candidacy only when the statistics sequence, core requirements, and all of the preliminary examinations have been completed.

Accelerated Entry into Ph.D. Degree Program. Students enrolled in the M.A. degree program may be admitted directly to the Ph.D. degree program following departmental certification of graduate work comparable to a master's degree in psychology at SIUC. Accelerated entry is acceptable only for students who have completed substantial work in other programs in psychology which grant the Ph.D. degree but not a master's degree. Students seeking accelerated entry may apply after enrollment at the master's level for one semester. Applications for accelerated entry are reviewed and decided by a faculty committee appointed by the department chair.

Internship. Doctoral students who are concentrating in clinical or counseling psychology must complete an approved internship: 48 weeks for clinical students, and the equivalent of nine months for counseling students. The timing of the internship varies from program to program; clinical students may take their internship at any time after the completion of the M.A. degree. In order to intern in the third year, a master's thesis prospectus must be approved by the end of the fall semester of the second year. They will not be approved for internship unless this stipulation is met. Alternatively, they may opt to complete all aca-

demic requirements before internship. Counseling students are approved for internship after completion of three years of academic work, unless they have opted for a concurrent internship. In the latter case, the student carries a half-time internship for two years concurrent with school attendance. Since the internship is viewed as an integral part of training, the Ph.D. degree is not awarded until the completion of all academic work and the internship.

Students are responsible, in consultation with their advisers, for scheduling and obtaining internships. It is expected that the internships will be with an APA approved internship agency, unless an exception has been approved.

Preliminary Examinations. Ph.D. candidacy is contingent upon successful completion of two written examinations both of which are composed primarily of essay questions requiring substantive knowledge of empirical and theoretical topics. Questions are not limited to course content.

The two preliminary examinations cover areas germane to the student's doctoral study, areas differing in subject matter and representing, in aggregate, approximately three years of graduate study.

Every student is expected to pass each examination on first taking. In any event a second failure on a preliminary examination will result in a thorough faculty review of the student's entire academic record in order to determine whether the student will be allowed to continue in the program and, if continued, under what conditions.

Minor/Specialization. The minor or specialization examination is tailored by the examining committee to the area of study approved for the student. The examining committee shall consist of at least two faculty members, one of whom will be designated as chair. After preliminary discussion of a topic area with the proposed committee chair and potential committee members, the student must meet with the major area director and present for final approval a request for the topic area and the examining committee (including additional examiners, if appropriate, and alternate readers).

The student must meet with the committee at least ten weeks prior to the examination in order to agree upon topics to be covered by the examination and to decide what additional preparation is necessary to assure adequately prepared action. Any changes in topic area or composition of the committee must be approved by the major area director. Should the student fail an examination there is the option of forming a different committee to administer the second examination subject to all the rules stated above.

Major/Comprehensive. Fields of concentration for the major/comprehensive preliminary examination are listed below:

1. Experimental. Any one field from the following may be selected for the comprehensive examination: applied experimental psychology, biopsychology, learning.
2. Clinical. The major examination includes the following: psychological assessment, psychotherapy, psychopathology, and personality. In addition for the student, the examination reflects the specialization emphasis, i.e., general, child, or experimental.
3. Counseling. The major examination includes the following areas: (a) adult personal, social, and career development, (b) assessment, (c) group and individual counseling theories and techniques, (d) research methodology and measurement, and professional issues.

Major/comprehensive examinations are scheduled by the department once a term, ordinarily within the first two weeks. Notices are posted well in advance and students are expected to notify the graduate secretary of their intention to take the examination. Examination committees are appointed by the chair.

Dissertation. Each candidate for the Ph.D. degree must write a dissertation showing high attainment in independent, original scholarship and creative effort. A total of 24 credit hours is required. A maximum of 8 hours of dissertation credit may be taken subsequent to passing the minor preliminary examination and prior to passing the major preliminary examination. A student may not hold a prospectus meeting before successful completion of both minor and major examinations.

Thesis and Dissertation Committee

Because the thesis or dissertation project and the proposed committee composition must be formally approved by the department chair, the student should arrange a meeting with the chair well in advance of the prospectus meeting.

A master's thesis committee consists of three members including the chair of the committee and a psychology faculty member who is typically from some field other than the student's major area of interest. The Ph.D. dissertation committee consists of five members, one of whom serves as chair. One of the members must be from a department other than psychology.

Prospectus. Prior to starting the experimental research on a thesis or dissertation, a student must submit a written prospectus to each member of the committee. A carefully written prospectus ordinarily serves as the opening chapters of the thesis or dissertation. The student also prepares an abstract (normally no more than two pages) to be posted in the psychology department office one week before the prospectus meeting.

The approval of the prospectus indicates that the committee members accept the research design. Faculty members not on the committee may attend the prospectus meeting, or may forward suggestions and comments to the committee chair prior to the meeting. Prospectus meetings are not scheduled during the recess period between semesters.

If the prospectus is approved with no major modifications, one copy of the prospectus and a letter of approval, noting any minor modifications are sent by the committee chair to the department chair for filing in the student's permanent records. If major modifications are needed, the student may be asked to rewrite the prospectus, circulate the revised prospectus, arrange another committee meeting, and then file the revised prospectus as above. A prospectus must be approved at least one semester before graduation.

Style. The student has the option of writing the thesis or dissertation in the traditional fashion or in journal style. In the latter case, ancillary material (full survey of literature, subsidiary analyses, etc.) are placed in the appendices, although figures and tables appear in the text. The psychology department prefers that citations, table headings, etc. follow the APA style (*Publication Manual of the American Psychological Association,* 1983 revision, Washington, D.C.).

General Procedures. Students should not register for 599 or 600 hours until they have supervisors and will actually be using university facilities, or faculty time for assistance and direction.

Prior to graduation (a minimum of five weeks for master's students and eight weeks for doctoral students) the candidate must submit a final rough draft of the thesis or dissertation to the full committee so that appropriate suggestions can be made. At least one week usually expires between the submission of the rough draft and the oral examination.

Number of Copies. Four copies of the complete thesis or dissertation are required: two copies are submitted to the Graduate School for placement in the

University library, and two bound copies—one for the committee chair, and one for the departmental thesis and dissertation library.

Oral Examination

The Department of Psychology requires an oral examination, conducted by the student's thesis or dissertation committee, for each M.A. and Ph.D. candidate. The examination covers the thesis or dissertation and also includes questions designed to ascertain the student's general competence in psychology.

Oral examinations are open to all interested observers. Notices of the time and place of the examination, and abstracts of the thesis or dissertation, are circulated throughout the department and, in the case of Ph.D. examinations, throughout the University. Two copies of the abstract should be given to the graduate program secretary.

The candidate obtains copies of the oral examination form and the thesis or dissertation evaluation form from the graduate program secretary, and delivers them to the committee members on the day of the orals. Orals meetings are not scheduled during the recess period between semesters.

General Information

Waiving of Course Requirements. Students who wish to have a course waived should consult with their advisers, the course instructor, and the head of their major area. One of the following recommendations will be made: (a) the course will be waived; (b) a proficiency examination (theoretical, practical, or both) will be given prior to deciding on the student's request; (c) the request will be refused and the student will take the course. A student may appeal the decision by writing a letter to the department chair requesting that the case be reviewed.

Grading Policies. Any student who receives a grade of *Inc.* is responsible for contacting the instructor to determine the time allowed for the completion of the course (normally not more than one year).

For internal records to be used within the department only, pluses and minuses are added to the standard *A, B, C* grades reported to the Office of Admissions and Records.

Student Evaluation. All students are evaluated by the faculty at least once a year, at the end of spring semester. In addition, new students are evaluated in the beginning of the spring semester (first year), and students on probation at times specified in their probation. The evaluation is based on the following criteria: (1) academic performance on a ten point rating scale (*A* + = 10); (2) ratings on the training assignment; and (3) progress toward the degree. The student's evaluation may also be based upon evidence relating to professional attitudes or ethical behavior.

Each student's adviser informs the student of the evaluation and of any faculty recommendations as soon as possible after the meeting. In addition, the department chair writes a formal letter notifying the student of the evaluation and recommendations.

Public Affairs

(See Political Science for program description.)

Radio-Television

(See Telecommunications for program description.)

Recreation

The Department of Recreation offers a broad interdisciplinary program of studies preparing students for administrative careers in recreation management. The program leads to the Master of Science in Education degree with a major in recreation.

Master of Science in Education Degree

Graduate work in recreation stresses administration and research and is open only to highly qualified students. All students must be admitted to the Graduate School in good standing.

The graduate students in recreation may select from three program concentrations, each fully accredited by the Council on Accreditation, NRPA, and AAHPERD. The first concentration, administration of recreation and park systems, focuses on skills necessary in the management of local, state, and national recreation programs both in the public and commercial sector. The second concentration, recreation resources administration, focuses on skills necessary to manage and administer programs, facilities, and lands in the local, state, and the national park systems and in a variety of additional outdoor and tourism settings. The third concentration, therapeutic recreation, focuses on skills necessary in the management of public and private organizations which provide a diverse array of therapeutic recreation services.

All concentrations require a minimum of 36 semester hours of course work including 3 hours of thesis, 3 hours of research methods, and 4 hours of inferential statistics. A student must maintain an overall 3.0 (4 point scale) grade point average in order to be eligible for a recommendation to graduate. Upon completion of the required research course a student should select a chairperson for the thesis supervisory committee as soon as is practicable. A minimum of two additional graduate faculty members, one holding rank outside the Department of Recreation, are needed to form the full committee. More than three graduate faculty members will be appointed if necessary. After approval of a thesis topic the student will conduct a research effort under the committee's guidance. Upon completion of the research a final oral examination covering the thesis is required.

Graduate students should select one of three areas of concentration. The decision regarding the concentration need not be made prior to enrollment at the University although the student should most probably make a selection sometime prior to the beginning of the second semester of study.

Major in Recreation

The areas of concentration and the requirements of each are listed below.

ADMINISTRATION OF RECREATION AND PARK SYSTEMS CONCENTRATION

Theory Core

REC 500-3 Principles of Recreation
REC 501-3 Personnel in Leisure Services
REC 502-3 Revenue Production for Leisure Services Organizations
REC 503-3 Managing and Marketing Leisure Services
REC 508-3 Trends and Global Issues in Leisure Services

Research Methodology Core
REC 550-3 Research in Recreation
Research Core
GUID 506-4 Inferential Statistics
REC 599-3 Thesis
Total core hours: 25
Elective hours: 11
Total hours required: 36

RECREATION RESOURCE ADMINISTRATION CONCENTRATION

Theory Core
REC 500-3 Principles of Recreation
REC 501-3 Personnal in Leisure Services
REC 502-3 Revenue Production for Leisure Service Organizations
REC 503-3 Managing and Marketing Leisure Services or
REC 508-3 Trends and Global Issues in Leisure Services
REC 445-3 Outdoor Recreation Management
REC 565-3 Seminar in Environmental and Outdoor Education or
REC 475F-3 Recreation Workshop: Tourism
Research Methodology Core
REC 550-3 Research in Recreation
Research Core
GUID 506-4 Inferential Statistics
REC 599-3 Thesis
Total core hours: 28
Elective hours: 8
Total hours required: 36

THERAPEUTIC RECREATION CONCENTRATION

Theory Core
REC 500-3 Principles of Recreation
REC 501-3 Personnel in Leisure Services
REC 503-3 Managing and Marketing Leisure Services
REC 508-3 Trends and Global Issues in Leisure Services
REC 524-3 Professional Skills in Therapeutic Recreation
REC 526-3 Professional Issues in Therapeutic Recreation
Research Methodology Core
REC 550-3 Research in Recreation
Research Core
GUID 506-4 Inferential Statistics
REC 599-3 Thesis
Other (May be required if student has not had equivalent courses or professional experience prior to entry into the graduate program. Undergraduate deficiency courses may be required dependent upon assessment of departmental graduate admissions committee.)
REC 460-3 Therapeutic Recreation
REC 461-3 Program Design and Evaluation
REC 462-3 Facilitation and Leisure Counseling Techniques
REC 596-3 Internship
Total core hours: 28
Elective hours: 8
Total hours required 36

Rehabilitation Institute

In response to pressing human and social needs, the applied field of rehabilitation has solidly entrenched itself as a professional discipline. Multidisciplinary courses of study have been drawn together from the behavioral, social, and medical sciences appropriate to the development of competent practitioners, supervisors, and programmers in rehabilitation and welfare agencies. The overall program is left purposely broad and flexible to permit the inclusion of training innovations and emerging career patterns.

The Rehabilitation Institute offers graduate programs leading to the Doctor of Rehabilitation degree and to a Master of Arts or a Master of Science degree with majors in behavior analysis and therapy, rehabilitation administration and services, and rehabilitation counseling.

The Master's Degree Program

The master's degree programs in rehabilitation administration and services, behavior analysis and therapy, and rehabilitation counseling are 45 semester hour programs. The distinction between the M.A. and M.S. degrees is one of demonstrable research performance. Candidates for the M.S. degree concentrate primarily on preparation for entry into the helping profession, and ordinarily they complete a project or research paper in their area of concentration. The M.A. degree requires a thesis of an experimental nature, in which candidates demonstrate their skills in formulating researchable questions, in identifying and manipulating experimental variables and in the analysis and the judicious reporting of the data.

BEHAVIOR ANALYSIS AND THERAPY

The behavior analysis and therapy program is a 45 semester hour program leading to either an M.A. or M.S. degree. Formal training is offered in behavior analysis and behavior therapy with focus on populations and settings such as mental retardation, emotional disorders, child behavior, sexual problems, behavioral medicine, child abuse and neglect, biofeedback, and consumer and management-related issues.

Degree Requirements

In fulfilling the 45 semester hour requirement, the student must complete the required courses and at least 18 semester hours of didactic course work in behavior analysis and therapy as described below.

The internship is usually completed following the first spring or during the second fall. Some students seek external internships (out of Southern Illinois area). To qualify for one of these internships, students must complete all other program requirements including the thesis before leaving for an external internship.

REQUIRED COURSES

Asterisks indicate didactic behavior analysis and therapy courses.
*503-3 Basic Behavior Analysis, taken first fall
*509a-3 Scientific Methods in Behavior Analysis, taken first fall
509b-3 Scientific Methods in Behavior Analysis, taken first spring
*535-3 Behavioral Observation Methods, taken first fall
512-3 Legal and Ethical Issues in Behavior Analysis
589-1 Professional Seminar in Behavior Analysis and Therapy, taken first fall and spring

594b-3 Practicum in Behavior Analysis and Therapy
595-8 to 12 Internship in Rehabilitation
599 or 593-3 to 6 Thesis or Research Paper

ELECTIVE COURSES

Asterisks indicate didactic behavior analysis and therapy courses.
508-3 Complex Behavior Analysis
*554-3 Behavior Therapy
*543-3 Child Behavior
*568-3 Sexual Behavior and Rehabilitation
*545-3 Behavior Modification in Mental Retardation
*515-3 Behavioral Applications to Medical Problems
*574-3 Staff Training and Development
*557-2 to 6 Self Regulation of Behavior
563-3 Behavioral Analysis: Community Applications
*564-3 School Related Behavior
594b-3 Practicum in Behavior Analysis and Therapy

THESIS OR RESEARCH PAPER

M.A. Degree. This degree requires that one receive an *S* grade for 3–6 hours of REHB 599. The thesis will be reviewed both prior to its initiation (as a prospectus) by a two member committee, and following its completion (in an oral defense) by a three member committee made up of a chair and at least one additional member. One other graduate faculty member, who may be from within the behavior analysis and therapy faculty. drawn from outside the faculty of the behavior analysis and therapy program, will serve as reader and attend the final review meeting.

M.S. Degree. This degree requires that one receive a passing letter grade for 1–6 hours of REHB 593. The research paper will be accomplished under the supervision of one of the faculty of the behavior analysis and therapy program.

REHABILITATION ADMINISTRATION AND SERVICES

Students receive their degrees in rehabilitation administration and services, but may elect to pursue concentrations in administration, services, or a double concentration. Students with less than three years of rehabilitation or related work experience are generally encouraged to pursue a services concentration or double concentration. All students must complete a minimum of 45 semester hours of graduate course work, which includes a full-time internship and a research project or thesis. During the first semester of full-time study or a comparable period for part-time students, the student must have a plan of study approved by an adviser and the degree program coordinator. This plan of study normally includes rehabilitation core, professional core, and elective course work, although specific plans may differ for students with varying backgrounds and career goals. The requirements are as follows:
Rehabilitation Core (21 hours)
REHB 400-3 Introduction to Rehabilitation
REHB 513-4 Medical and Psychosocial Aspects of Disability
REHB 594A-3 to 6 Practicum in Rehabilitation
REHB 595-8 to 12 Internship in Rehabilitation
REHB 593-3 Research in Rehabilitation
or
REHB 599-3 Thesis

Professional Concentrations

The student must complete a series of courses approved by the student's faculty adviser and degree program coordinator. This series of courses will normally consist of a 15-hour professional core and 9 hours of electives. Electives are chosen on the basis of their relevance to the declared professional concentration. Students taking double concentrations will normally take two 15-hour professional cores and no electives. Persons graduating with concentrations in vocational evaluation or adjustment services are immediately eligible to sit for the CCWAVES examination.

REHABILITATION ADMINISTRATION CORE

570-3 Rehabilitation Administration
573-3 Programming, Budgeting, and Community Resources
576-3 Development and Supervision of Rehabilitation Employees
578-3 Program Evaluation in Rehabilitation
582-3 Seminar in Rehabilitation Services

VOCATIONAL EVALUATION CORE

431-3 Assessment Procedures in Rehabilitation
436-3 Vocational Evaluation and Adjustment Services
531-3 Individual Assessment Procedures in Rehabilitation
533-3 Vocational Appraisal
583-3 Seminar in Work Evaluation

ADJUSTMENT SERVICES CORE

406-3 Introduction to Behavior Analysis and Therapy
436-3 Vocational Evaluation and Adjustment Services
452-3 Behavior Change Applications
523-3 Job Restructuring for the Handicapped
525-3 Developing Job Readiness

JOB DEVELOPMENT AND PLACEMENT CORE

421-3 Vocational Development and Placement
525-3 Developing Job Readiness
586-3 Seminar in Job Development
BA 450-3 Marketing Concepts
BA 543-3 Personnel Management

Practicum and Internship Requirements

Although students are usually required to complete at least 3 to 6 semester credit hours of practicum as well as a full-time internship, prior and concurrent work experience may be substituted for these requirements if recommended by the student's adviser and approved by the rehabilitation administration and services faculty. The options available to the student wishing to substitute work experience for either practicum or internship requirements are as follows.

Option One. The student may request a waiver of the internship requirement and, if approved, substitute 3 semester credit hours of practicum and additional course work to bring the student's program up to the required 45 hour minimum.

Option Two. Students with extensive previous work experience in the field of rehabilitation may request waivers of both the practicum and internship requirements. If the waiver is approved, they will enroll in 6 semester hours of REHB

494, Work Experiences in Rehabilitation, and additional graduate course work up to the required 45 hour minimum.

Waiver requests related to options one and two above must be submitted by the student through the faculty adviser to the coordinator of the rehabilitation administration and services program and must be approved by a vote of the rehabilitation administration and services faculty. Waiver requests must include written documentation of the reasons for the request and provide sufficient supporting evidence. Suggested guidelines for the appropriateness of each of the options are: 1) option one for the student with three or more years of satisfactory rehabilitation related work experience and 2) option two for the student with three or more years of satisfactory work experience directly related to the student's chosen professional course sequence. The student with minimal or no rehabilitation related work experience will be expected to complete the required 3 to 6 semester hours of practicum and a full-time internship.

Research Paper/Project or Thesis and Comprehensive Examination

The student seeking the M.S. degree is required to complete a scholarly research paper or project in a rehabilitation related area and an oral or written comprehensive examination. The student seeking the M.A. degree is required to complete a graduate thesis in a rehabilitation related area and defend it before a thesis committee, an oral or written comprehensive examination, and in addition, an approved course in research statistics or research design.

REHABILITATION COUNSELING

The focus of the major in rehabilitation counseling is the training of competent professionals for the broad field of rehabilitation. The trained professional counselor must demonstrate competencies in establishing counseling relationships, case evaluation, assessment procedures, vocational placement, as well as have an awareness of professional and community resources that can be utilized in the rehabilitation process. Therefore, this master's level training program has three goals:

a. Preparation of professionals who can provide effective rehabilitation counseling service to facilitate the person with a disability in their growth in personal, social, and vocational areas.
b. Training individuals to maximize their professional skills through an integration of the theoretical and applied basics of rehabilitation.
c. Preparation of professionals who can provide leadership in the application and delivery of rehabilitation services.

This professional preparation program is based on nationally defined needs for rehabilitation counselor training and has been accredited by the Council on Rehabilitation Education. Upon completion of the program graduates are eligible to apply (via examination) for certification as rehabilitation counselors (C.R.C.).

The overall objective of this program is to provide students with the opportunity for professional development with the skills and knowledge necessary to meet effectively the many challenges in rehabilitation.

General Requirements

To meet these goals, the rehabilitation counseling program requires a minimum of 45 semester hours of graduate work leading either to a M.A. or M.S. degree. The M.A. degree requires a formal thesis and oral examination, while the M.S. specifies a research paper, and the oral examination is optional. Both M.A. and M.S. degrees require the satisfactory passing of a comprehensive examination. Further, all students after completing the majority of their didactic and experiential course work are required to satisfactorily complete a three month full-time supervised counseling internship in an approved rehabilitation setting.

Core Course Requirements

While there is sufficient flexibility in the curriculum so that special interest can be pursued by students through field training assignments, seminars, and the internship assignment, the following core requirements must be met:
REHB 400 Introduction to Rehabilitation
REHB 421 Vocational Development and Placement
REHB 431 Assessment Procedures in Rehabilitation
REHB 451 General Rehabilitation Counseling
REHB 501 Rehabilitation Foundations
REHB 513 Medical and Psycho-Social Aspects of Disability
REHB 594c Practicum in Rehabilitation
REHB 595 Internship in Rehabilitation

Students often specialize in working with particular disability groups, e.g., mentally retarded, emotionally disturbed, physically disabled, public offender, the elderly.

ALCOHOL SPECIALIST CONCENTRATION

The program in rehabilitation counseling includes the concentration of alcohol specialist. The objective is to prepare rehabilitation counselors who will have the knowledge and skills needed to serve the alcoholic populations and their families and other affected persons.

The student in this concentration will meet all the requirements for the M.A. or M.S. degree in rehabilitation counseling.

DOCTOR OF REHABILITATION

The doctoral program in rehabilitation prepares students to function effectively as rehabilitation educators, researchers, or administrators. It does this by fostering the student's development and acquisition of relevant conceptual and experiential skills in evaluation and research methodologies, in rehabilitation service, or in the management of service units.

Admission and Retention Standards

All applicable policies and procedures of the Graduate School with regard to the admission of doctoral students will be followed. Requirements for admission to the doctoral program in rehabilitation exceed those of the Graduate School. The admissions committee of the doctoral program will review all candidates carefully for their special strengths. The following will be considered for all candidates.

1. High academic achievement (normally indicated by a grade point average of 3.5 on a 4-point scale) in a master's program in rehabilitation or a closely related field at an accredited university.
2. Knowledge of, and interest in conducting, rehabilitation research.
3. Two years of successful performance equivalent to fulltime paid employment (post-baccalaureate) in a rehabilitation or related professional position. This may include an approved internship experience at the master's level.
4. At least three letters of recommendation by professional persons who are familiar with the applicant's performance in academic, research, or service work settings.
5. A personal or telephone interview with the Rh.D. program admissions committee.
6. GRE scores dating back no farther than five years.

Applicants will be considered for acceptance into the doctoral program at the beginning of either the fall or spring semester. For a student to be retained in

the program, a 3.5 overall grade point average (GPA) must be maintained. Courses in which a grade below *B* is obtained will not be counted toward satisfying the hour requirements for the degree.

Doctoral Committee

The student shall select a chair who will serve as the major adviser. In consultation with the chair the student shall select a doctoral committee which is approved by the coordinator of doctoral studies and the Graduate School. At least one member shall be external to the Rehabilitation Institute.

Working together with the chair, the student shall develop a plan of study, designating the courses to be completed. This plan shall be approved by the student's doctoral committee and by the coordinator of doctoral studies and then shall be made a matter of record. Further, the doctoral committee shall serve as the student's dissertation committee.

Admission to Candidacy

Admission to candidacy is granted by the dean of the Graduate School upon the recommendation of the faculty responsible for the student's program after the student has fulfilled the Graduate School residency requirement for the doctoral degree and passed the preliminary examinations.

The written preliminary examinations are designed to assess the breadth and depth of the student's knowledge. They are prepared, administered, and evaluated by Rehabilitation Institute faculty committees appointed by the coordinator of doctoral studies. The preliminary examinations will ordinarily be taken in the spring of the second year of doctoral study.

Dissertation

After admission to candidacy, the student will prepare a dissertation based on original research conducted under the direct supervision of the dissertation chair and committee. The requirements of the Graduate School will govern the formation of the dissertation committee and the preparation and defense of the dissertation. While the dissertation is in preparation, the student will register for no fewer than 24 semester hours in REHB 600, Dissertation. The dissertation should conform to the current edition of the *Publication Manual of the American Psychological Association* and the standards required by the Graduate School.

Degree Requirements

The Doctor of Rehabilitation program emphasizes mastery of skills in research methodology, knowledge of human behaviors, and competencies in the areas of rehabilitation philosophy, policies, and practices. The course of study requires a minimum of 96 post-baccalaureate semester hours, 24 of which are dissertation hours and 34 of which fulfill the core area requirements below.

Core Areas with Required Minimum Hours

Asterisked courses are required unless waived by the Rh.D. program requirements committee.

RESEARCH DEVELOPMENT AND UTILIZATION (MINIMUM 17 HOURS)
EPSY *506-4 Inferential Statistics
EPSY *507-4 Multiple Regression
REHB *509a-3 Single Subject Experimental Designs
REHB *509b-3 Group Experimental Designs
REHB *588-3 Seminar in Research in Rehabilitation
REHB 504-3 Foundations of Rehabilitation Research

SEMINAR ON PROFESSIONAL ISSUES AND METHODS IN REHABILITATION (MINIMUM 12 HOURS)
REHB 573-3 Programming, Budgeting, and Community Resources
REHB 574-3 Staff Training and Development
REHB 578-3 Program Evaluation in Rehabilitation
REHB *581-3 Legal and Ethical Issues
REHB 587-3 Seminar in Correlates of Disability
REHB *589-3 Professional Seminar in Rehabilitation

The student's preparation at the master's level will be evaluated and up to 30 hours of didactic course work may be accepted toward the completion of the 96 hour minimum requirement for the doctorate. Master's level didactic courses in rehabilitation counseling, rehabilitation services, rehabilitation administration, and applied behavior analysis and therapy will usually be acceptable. Course work in related areas such as counseling, psychology, and social work may qualify.

The goal of the program is to develop high quality professionals. Thus, the student must demonstrate competence in the areas of rehabilitation services offered by the Rehabilitation Institute. This is accomplished through the student's master's degree program, previous work experience, the doctoral core requirements, supervised professional experiences, and electives. Rh.D. degree graduates should be well prepared for leadership roles in the areas of rehabilitation administration, service, education, or research.

Social Work

The School of Social Work offers graduate work leading to the Master of Social Work degree. The M.S.W. Program is fully accredited by the Council on Social Work Education.

Master of Social Work

The Master of Social Work degree program offers preparation for professional social work practice. The organizing principle of the M.S.W. program is the improvement of the quality of individual life through the enhancement of social and economic justice and opportunity. Upon completion of the M.S.W. program, the student will acquire knowledge, values, and skills consonant with the social work profession and be capable ultimately of engaging in autonomous social work practice. Graduates with such preparation will be able to effectively deliver the social services needed to meet human needs in both urban and rural areas.

Students in the first year of the program take the foundation curriculum which consists of 30 credit hours and includes the following courses:

Fall (15 credit hours)
SW 500-3 Human Behavior & the Social Environment I
SW 505-3 Foundations of Social Work & Services
SW 510-3 Social Work Practice I
SW 511-3 Social Work Research
SW 542-4 Social Work Practicum I

Spring (15 credit hours)
SW 501-3 Human Behavior & the Social Environment II
SW 504-2 Ethnic Diversity & Social Work Practice
SW 506-3 Social Welfare Policy Analysis & Design
SW 520-3 Social Work Practice I
SW 542-4 Social Work Practicum II

The second year curriculum is organized around the following emphasis areas: health/mental health and child welfare. The school also offers course work in

preparation for School Social Work Type 73 Certification by the Illinois State Board of Education. Applicants must indicate their preference for an emphasis area. Although we attempt to accommodate the applicant's first preference for a second year emphasis area, we do not guarantee that individuals will receive their first choice in emphasis area or in field practicum assignment.

In each year of study, in addition to classroom work, students are required to take field practicum. Applied learning through field practice is an integral component of social work education. Field instruction provides the student with the opportunity for applying social work theory and conceptual learning to realistic and practical situations. Students may not substitute current or past, paid or volunteer, social work experience for field practicum requirements of the M.S.W. program. While the school takes into account the student's career goals in the selection of the field practicum assignment, we do not guarantee that students will receive their first preference of field assignment.

Admission Requirements

To be considered for admission to the regular two year M.S.W. program applicants must:

1. Meet all admission requirements set forth by the Graduate School.
2. Have a GPA of at least 3.0 (on a 4.0 scale) in the last two years of undergraduate course work.
3. Show evidence of a broad liberal arts base with substantial preparation in the social and behavioral science and humanities.
4. Demonstrated content in human biology and introductory statistics.
5. Receive a satisfactory score on the Graduate Record Examination (GRE).

Documented potential for the profession of Social Work is considered a part of the admission criteria, which may also include an interview prior to acceptance. Entry is in the fall semester for the regular two year program.

To apply, you must complete and submit a Graduate School application and an M.S.W. program application. Application material may be obtained from: M.S.W. Admission's Office, School of Social Work, Southern Illinois University at Carbondale, Carbondale, IL 62901.

Applicants who wish to be considered for advanced standing must meet all criteria noted above, with the addition of a bachelor's degree in social work from an accredited program. Applicants seeking admission with advanced standing must demonstrate content in human biology, introductory statistics and have GRE scores on file. To be considered for admission applicants are required to register as unclassified students with the Graduate School, and receive a grade of *B* or better in each of the following courses: SW 502, 512, and 522. Such applicants then are eligible for recommendation to the M.S.W. program with advanced standing in the fall semester.

Applicants admitted for either the basic two-year program or for advanced standing may be required to take additional courses as a condition of admission.

A reduced-load program is available for a limited number of students with or without a B.S. degree in social work, who are either fully employed or prefer to take fewer than three courses per semester. This program requires a minimum of two consecutive semesters of full-time residency as defined by the University (e.g., fall-spring, spring-summer, or summer-fall). Requests to change from full-time to full-time reduced-load status requires prior approval of the director.

Each application will be individually reviewed; however, meeting all stated criteria will not automatically guarantee admission to the school.

The deadline for applications is February 15 for the advanced standing program and March 15 for the regular two year program.

Applicants must apply to both the Graduate School and the School of Social Work. Students accepted into the M.S.W. program are admitted in the fall and must register for the semester they are admitted.

Degree Requirements

Students admitted to the regular two-year program are required to complete the first year foundation curriculum and the second year advanced curriculum. They are required to complete a minimum of 60 semester hours of graduate course work taken in the approved sequence.

Students with a bachelor's degree in social work from an accredited program may be admitted with advanced standing. These students are required to complete 9 semester hours of transition courses with a grade of *B* or better in each course, and a minimum of 30 semester hours of the second year graduate course curriculum, including all required courses, taken in the approved sequence.

Within limits imposed by the policies of the Graduate School of the University, transfer credits will be permitted for up to 30 semester hours for applicants who wish to transfer from another graduate program in social work.

Candidates must maintain a 3.0 on a 4.0 scale.

Student Advisement

Upon admission to the Master of Social Work degree program, the student will be assigned a faculty adviser. The adviser is responsible for supervision of the student's progress and is available for career counseling as well as assisting in other matters which might arise in connection with the student's work.

Financial Aid

The program offers limited financial assistance through graduate assistantships. Other scholarships, grants-in-aid, etc., may be applied for through the Graduate School, Southern Illinois University at Carbondale, Carbondale, IL 62901.

Sociology

The Department of Sociology offers graduate work leading to the M.A. and Ph.D. degrees. The M.A. degree program provides students with the opportunity to acquire a general knowledge of sociology through courses and seminars which illustrate a variety of approaches characterizing the discipline. The Ph.D. degree program is centered around advanced offerings in the areas of theory-methodology, deviance, family, social stratification, and social change. The faculty of the department is research-oriented and supports such an orientation on the part of its students. The department maintains a small library and computer facility.

Admission to Graduate Study in Sociology

The department requires an undergraduate GPA of 3.0 for admission to the M.A. degree program and a graduate GPA of 3.5 for admission to the Ph.D. degree program. Reference letters and transcripts of all undergraduate and graduate academic grades must be submitted to the department for review by the graduate admissions committee. Scores from the Graduate Record Examination are welcome. International students must achieve 550 or better on TOEFL scores. Persons seeking more information should write: Director of Graduate Studies, Department of Sociology, Southern Illinois University at Carbondale, Carbondale, IL 62901.

Graduate Assistantships and Fellowships

Assistantships for qualified students are available through the department on a competitive basis. Upon nomination by the University's academic departments, the Graduate School awards various fellowships in University-wide competition. Students funded through the department are required to enroll in three courses each semester, taking no more than one audit and one individual readings

course each academic year. Funding is limited to four semesters for M.A. degree students and eight semesters for Ph.D. degree students.

Master of Arts Degree

The Master of Arts degree in sociology requires a minimum of 32 semester hours of course work and a research paper. The specific course requirements are SOC 501, Classical Sociological Theory; SOC 512, Sociological Research; SOC 526a, Quantitative Methods in Sociology; three research seminars in sociology; one additional 400 or 500 level course in sociology; one additional 400 or 500 level course in sociology; and four credit hours in SOC 591, Individual Research (for completion of the master's degree research paper). The director of graduate studies serves as academic adviser for all M.A. degree students.

Master's Research Paper. The research paper is developed from a seminar paper produced in a 500-level sociology course. Students wishing to do a master's research paper on a topic not covered under the seminar offerings can petition the department's graduate studies committee for an exception to this rule. The faculty member in charge of the seminar will also serve as the adviser for the master's research paper. Students will enroll with this faculty member for 4 credit hours in SOC 591, Individual Research, for the completion of the research paper. This course can be taken concurrently with or subsequently to the research seminar. The research paper will then be submitted for evaluation to another faculty member appointed by the director of graduate studies, in concurrence with the faculty adviser for the paper. The master's research paper normally is 20 to 40 pages in length and uses the standard ASA reference style. In addition to the copy required by the Graduate School, one suitably bound copy must be deposited in the department library.

Early Admission to the Ph.D. Degree Program. Upon completion of two semesters of full-time study, a student may petition to waive the M.A. degree and be admitted to the Ph.D. degree program in sociology, if the following conditions have been met: 1) minimum GPA of 3.7 during the first year of study; and 2) departmental approval of a research paper completed during the first year of study. The procedure and standards for approval of the paper are the same as with the regular master's research paper.

Doctor of Philosophy Degree

Advisement. The responsibility for initial advisement rests with the director of graduate studies. As soon as a tentative general plan of study has been worked out, the director of graduate studies, in consultation with the student, will request an appropriate member of the graduate faculty of the department to serve as the student's individual academic adviser.

It is the student's responsibility to develop, in consultation with the adviser, a plan of study designating the primary and secondary areas of examination. At this point, the student expresses a preference for a program committee of three or four members representing the chosen areas of examination. After consultation with the appropriate faculty the director of graduate studies appoints the student's program committee and enters the membership of the committee in the student's records, along with the declared primary and secondary areas of examination.

Research Tool Requirement. Doctoral students must complete the following courses: SOC 501, 502, 512, and 526a,b, or furnish proof of equivalent work at the M.A. degree level. The director of graduate studies will determine questions of equivalencies. In addition to these courses students must develop research

skills that are appropriate and necessary for their dissertation research. It is the responsibility of the student's program adviser to supervise the student's development of these research skills.

Areas for Comprehensive Examination. All students must declare two primary areas for the comprehensive examination (one of which must be sociological theory-methodology) and two secondary areas of examination. At present the department regularly offers lecture courses and seminars in the following primary areas of examination: theory-methodology, deviance, sociology of the family, social stratification, and social change. For their secondary areas of examinations, students may select from those areas just listed, or from the following: gender, demography, education, formal organizations, political sociology, medical sociology, social psychology, and quantitative methods.

Other areas of examination may be offered in particular cases as student needs arise and faculty resources permit. Approval of a special area of examination must be obtained from the graduate studies committee at least one semester before the intended date of examination.

One secondary area may be chosen in a department other than sociology. The student shall in this case meet the requirements for a Ph.D. secondary field in the department concerned. Relevance of the outside area to the student's total program must be demonstrated, and approval must be obtained from the graduate studies committee.

Course Work and Readings. In addition to the regularly offered courses and seminars the department provides supervised readings and research courses, depending upon the availability of faculty members. Supervised readings and research courses are not to be taken as substitutes for regularly scheduled courses and seminars, and registration in them requires prior approval by the student's adviser.

Preparation of a Readings List. Students are expected to prepare themselves for comprehensive examinations through course work and reading. Students must develop, with the assistance of their program committees, a readings list covering the students' examination areas. This readings list must include major works in each of the examination areas. It must also include the most recent works pertinent to the students' anticipated dissertation research. The readings list as a whole must be prefaced by a statement of purpose providing a rationale for the selected titles. The final list must be approved, in formal session, by the students' program committee, no later than the end of the students' third semester in residence.

Comprehensive Examinations. To qualify for the status of candidate for the Ph.D. degree, the student must pass written comprehensive examinations. Examinations are based on the final readings list as approved by the student's program committee. The comprehensive examinations consist of a six-hour exam in each of the two primary areas and 3 hours in each of the two secondary areas.

The examinations are prepared, administered, and evaluated by the student's program committee, supplemented by other members of the graduate faculty, in order to provide at least two readers in each of the major and minor areas. The chair of the program committee also serves as chair of the examination committee. Supplementary members of the examination committee are, upon the recommendation of the program committee's chair, appointed by the director of graduate studies.

The comprehensive examinations must be taken during the full-time student's fifth semester in the program. The student may take all exams in either the fourth or the twelfth week of the semester, or opt to take theory-methodology

and one minor exam at the early date, and the rest at the later date. It is the responsibility of the chair of the examination committee, and of the director of graduate studies, to ensure that the examinations are properly prepared, scheduled, administered, and monitored.

Examination results are reported to the director of graduate studies by the chair of the student's examination committee within two weeks from the date of the examination, and the director of graduate studies notifies the student of the results. A failed examination in any area must be retaken on the next scheduled date. If an area exam is failed a second time, the graduate studies committee must be petitioned for the privilege of a final retake. The written petition must include the student's diagnosis of the reasons for the failure, and a detailed plan for remedial work. The recommendation of the graduate studies committee is forwarded to the department chair, who has the final decision on the matter. A student is entitled to a combined total of no more than three retakes.

On successful completion of the comprehensive examinations, and upon the recommendation of the director of graduate studies to the dean of the Graduate School, the student attains the status of candidate for the Ph.D. degree.

Dissertation. The dissertation is the single most important requirement for the Ph.D. degree, and the student should start thinking about potential dissertation topics soon after admission. Information concerning Graduate School requirements regarding the dissertation is contained in the Graduate Catalog.

After completion of the comprehensive examinations the student selects a dissertation director who must be approved by the department chair and the dean of the Graduate School. In consultation with the dissertation director, the student prepares a detailed dissertation prospectus, showing clearly the purpose and scope of the research, its relation to the previous work in the field, its theoretical relevance and significance, and the research methods and techniques to be used. The prospectus must contain a section documenting the student's training and abilities in using the proposed research methods and techniques. When the prospectus is ready for presentation, the department chair appoints a dissertation committee with the student's dissertation director serving as chair. The dissertation committee shall consist of five members, including one from outside the Department of Sociology.

The prospectus must be approved by the dissertation committee in formal session and filed with the graduate program secretary. A prospectus must be approved no later than the end of the student's sixth semester in the program.

The completed dissertation must be acceptable to the chair of the dissertation committee before being circulated among the committee members for evaluation.

Dissertation Defense. After acceptance of the dissertation by the candidate's dissertation committee, an oral examination will be conducted by the committee in open meeting, as specified by Graduate School regulations. This examination will be based upon the contents and implications of the dissertation. The examination may not be scheduled sooner than four weeks after the completed dissertation has been distributed to the dissertation committee. A public announcement and a copy of the dissertation shall be made available to other faculty of the department at least one week before the examination. Upon satisfactory completion of the oral examination, the student must submit two copies of the dissertation to the Graduate School and another copy, suitably bound, must be deposited in the department library.

Expected Progress Through the Ph.D. Degree Program.
Semesters 1 and 2: Course work: Minimum grade point average of 3.5; at least four 500-level sociology courses to be taken during the two semesters.

Semester 3: Course work and approved reading lists by the end of the third semester.
Semester 4: Course work and intensive preparation for comprehensive examinations.
Semester 5: Comprehensive examinations.
Semester 6: Approved prospectus by the end of the sixth semester.
Semester 7: Dissertation.
Semester 8: Dissertation.

Sociology as a Secondary Emphasis in Another Ph.D. Degree Program. A student who is enrolled in another Ph.D. degree program and who wishes to declare sociology as a secondary area must submit to the director of graduate studies a written request which includes the following: a plan of course work, a personal reading list, and an overall program statement indicating the relationship of the area in sociology to the student's total program. The student will be expected to take a comprehensive examination in the sociology area.

Interdisciplinary Ph.D. Degree Program in Sociology. Students who have been admitted to the Ph.D. degree program in sociology, and who wish to develop an interdisciplinary program, should review the guidelines set forth by the Graduate School. The graduate dean approves interdisciplinary Ph.D. degree programs only when they bear the endorsement of a department that offers a Ph.D. degree program. A student who wishes to apply for an interdisciplinary program in which sociology will be the sponsoring department should understand that the program of study must include substantial involvement in sociology courses and seminars, and that the department may require the student to meet other requirements similar to those established for the Ph.D. degree program in sociology.

Special Education

The department offers programs leading to the Master of Science in Education degree with a major in special education and to the Doctor of Philosophy degree in education with a concentration in special education.

Master of Science in Education degree

In the master's degree program, which requires a minimum of 30 semester hours for completion, six emphases are offered. All are designed primarily for those who are already certified to teach, and who have attained an undergraduate grade point average of at least 2.7 on a 4 point scale. Some of the emphases require prior certification in one area of special education as well. Students desiring entry into the program but lacking appropriate certification may complete the necessary requirements in conjunction with their program. Such students will be advised on certification requirements in the Office of Teacher Education. Applicants with grade point averages less than 2.7 may at the discretion of the departmental faculty be admitted conditionally. They may also be required to complete all or a part of the Graduate Record Examination and to submit the results as a part of their application to the department.

There are six emphases open to those seeking a master's degree in special education: (1) coordinator of classes for the preschool handicapped, (2) resource teacher of the mildly handicapped, (3) teacher of the moderately and severely handicapped, (4) teacher of the severely behavior disordered, (5) teacher of the secondary aged mildly handicapped, (6) special education supervisor. Program requirements for each of these emphases include the following courses: SPE 500-

3, 578-3, 580-3, and 599-3 to 6. In addition, they require completion of the courses specified in the explanation of each of the six areas of emphasis.

Coordinator of Classes for the Pre-School Handicapped. Those selecting this emphasis will, as a rule, have completed certification requirements in at least one other area of special education, and during the program will complete requirements for approval in the pre-school handicapped area. Upon completion of the program, they will be prepared to work either as classroom teachers or as program coordinators in this area. In addition to the core courses, they must complete: SPE 505-3, 512-3, at least one of 513-3, 514-3, or 515-2, and additional electives selected in cooperation with the graduate adviser.

Resource Teacher of the Mildly Handicapped. Students choosing this emphasis will ordinarily enter the program with certification in at least one area of special education and during the program will find another area of special education certification. Their training will prepare them to work as resource personnel in school programs where mildly handicapped children have been returned to regular classes. In addition to the core courses, they must complete: one of SPE 401-3, or 404-3; 511-3; at least one of 513-3, 514-3, or 515-2; and additional electives selected in cooperation with their graduate adviser to a total of at least 30 semester hours.

Teacher of the Moderately and Severely Handicapped. Students choosing this emphasis will ordinarily have been certified in the area of trainable-severely/profoundly handicapped or behavior disorders, and during their master's degree program will be pursuing an advanced degree of knowledge and expertise. However, persons without a teaching certification are also admitted to this degree program but must complete all course deficiencies. The major objective of this program is to prepare educators to apply systematic instruction technology to the learning and behavioral problems of moderately and severely handicapped persons so that they might function as fully as possible in community life. After completion of this program, graduates will be prepared to directly teach or supervise educational efforts in school, community, domestic, and vocational settings. Program applicants may declare an emphasis in severe behavior disorders or moderate/severe/profound mental retardation. In addition to the core course requirements, students must complete characteristics and methods deficiencies, SPE 550-3, and additional electives selected in cooperation with their graduate adviser. For a student choosing a joint emphasis in mental retardation and behavior disorders, specific departmental and nondepartmental electives may be designed from which the student must choose.

Teacher of the Severely Behavior Disordered. Students choosing this emphasis will ordinarily have been certified in the area of behavior disorders, and during their master's degree program will be pursuing an advanced level of knowledge and expertise. Persons without a teaching certificate are also admitted to this degree program, but must complete all course deficiencies. The major objective of this program is to prepare educators to apply systematic instruction technology to the learning and behavioral problems of severely handicapped persons so that they might function as fully as possible in community life. After completion of this program, graduates will be prepared to directly teach or supervise educational efforts in school, community, domestic, and vocational settings.

In addition to the core course requirement, students must complete characteristics and methods deficiencies, SPE 501-3; 550-3; and additional electives selected in cooperation with their graduate adviser. For a student choosing a joint emphasis in mental retardation and behavior disorders, specific departmental

and nondepartmental electives may be designated from which the student must choose.

Teacher of Secondary Aged Mildly Handicapped. Teachers with this emphasis will be expected to have a bachelor's degree in special education. At the conclusion of this program the students will be qualified to teach secondary aged mildly handicapped youths in a variety of public and private school settings. In addition to the core courses, the students must complete: SPE 516-3, 519-3, and EPSY 402-3, and at least 9 hours from either vocational education studies, administration of justice, Rehabilitation Institute, or some combination of the above. The students' academic programs are planned in consultation with their adviser on the basis of interest and experiences.

Special Education Supervisor. Students choosing this emphasis will enter the program with certification in at least one area of special education and a minimum of two years teaching experience in their area of certification. Upon successful completion of the program, the students will be eligible for supervisory certification in the special education area of teaching experience. The program has as its purpose the training of effective instructional leaders. In addition to the core courses, they must complete: EAHE 501-3, 503-3, 517-3 or 519-3, 511-3 or C&I 531-3 or C&I 571-3, SPE 513-3, 514-3, and additional electives selected in cooperation with their graduate adviser to a total of at least 32 semester hours.

Research requirements for the master's program are as follows:

1. The student must successfully complete SPE 500-3, and then SPE 599-2 to 6 during which the thesis is completed.
2. The student must successfully defend the thesis in an oral examination conducted by the student's committee chair and two additional committee members.

A comprehensive examination over the field of special education is also required and conducted by the student's committee chair and two additional committee members.

All full-time graduate students in the department may be required to work a maximum of five hours per week in departmental activities as a part of their professional development.

Doctor of Philosophy Degree in Education

The Department of Special Education participates in the doctoral program in education with a concentration in special education. Inquiries regarding application should be directed to the chair of the department. See the description of the Ph.D. degree in education.

Speech Communication

At a time when many speech communication departments are staffed by individuals representing the same school of thought, our department has a healthy diversity of outlooks and approaches. Nevertheless our diversity has not prevented the development of an exceptionally supportive interpersonal climate. While we argue about a great many issues, we are committed as colleagues to effective teaching and productive scholarship. We believe that our students share these commitments, and we are most anxious to recruit students who want to study in such an environment.

Our facilities include a superior laboratory for oral performance studies, the Calipre stage, computer terminal laboratory room, video tape laboratory, library, and research carrels all housed in the department. We offer graduate assistants

the opportunity for independent teaching experiences as well as the usual support duties as teaching and research assistants. All graduate students are eligible for training experiences through internships in business, governmental, and political organizations.

Financial Assistance

There are several forms of financial assistance available to graduate students in the Department of Speech Communication. First, there are graduate fellowships awarded on the basis of superior scholarship, which do not require any departmental service. Second, there are several special fellowships offered annually to students who show promise of success in graduate studies even though their academic records have been only average because of economic or social disadvantages. These special fellowships have no service requirements. Third, there are graduate assistantships available which require up to 20 hours per week of service in teaching or research. Finally, there are dissertation research awards for students in their final year of work toward the Ph.D. degree.

The stipends for the above awards currently range from $5976 to $6372 for the nine month academic year depending on the level of graduate study of the appointee and the type of appointment. These rates may be increased for the forthcoming year. All the appointments, fellowships, and assistantships, also include a waiver of tuition (both in-state and out-of-state) for the student, although the student is responsible for student fees. Students who hold assistantship appointments for two consecutive semesters also receive a tuition waiver for the following summer session, and a limited number of appointments pay stipends for summer assignments as well.

Applications for financial assistance may be obtained by writing: Director of Graduate Studies, Department of Speech Communication, Southern Illinois University at Carbondale, Carbondale, Illinois 62901. Completed applications for fellowships should be received by February 1 for appointment during the subsequent fall semester. Applications for fall semester assistantships should be received by March 1.

The Department of Speech Communication offers three graduate programs of instruction and research in the discipline of human communication leading respectively to the Master of Arts, Master of Science, and Doctor of Philosophy degrees.

Curriculum. The graduate faculty of the department offers curriculum areas in communication education, interpersonal communication, philosophy of communication, performance studies, and (at the doctoral level) theater as well as course work in intercultural communication (including semiotics), organizational communication and public relations, political communication, and rhetoric and public address.

Admissions. Applicants must meet the minimum requirements of the Graduate School and should have completed a minimum of 24 quarter or 16 semester credit hours in speech or related subjects. A program for remedying deficiencies in background can be arranged upon petition to the graduate committee of the Department of Speech Communication. In some instances applicants will be accepted for direct entry from the baccalaureate to the doctoral program when the graduate committee identifies high achievement and potential in the applicant's undergraduate work. Master's degree students seeking the Ph.D. degree should make application when they are within 16 hours of completing the degree.

Application for admission to graduate studies in speech communication should be directed to the director of graduate studies of the Department of Speech Communication. The GRE Aptitude Test is not required as a condition for admission but is strongly recommended. In some cases it may be requested to support ap-

plication materials. Except for persons from English-speaking countries, international students are required by the department to have a TOEFL score of 600 or higher for admission. In addition to materials sent to the Graduate School, each applicant should submit to the Department of Speech Communication three recommendations from former instructors and an application form indicating professional and personal objectives. In addition, applicants for the Ph.D. degree program may be requested to furnish a thesis or research paper as evidence of research and writing ability.

Acceptance for graduate study in speech communication and subsequent continuation in the graduate program is determined by the graduate committee of the Department of Speech Communication. Students who are awarded graduate assistantships to provide assistance in the instruction of the department are required to take SPCH 539 if they have not had previous teaching experience at the secondary, college, or university level; the course is strongly recommended for all students planning careers in university teaching.

Research Style. In most cases graduate students are required to write a term research paper for each course taken; and, depending on the degree program, each student is required to write a research report, thesis, or dissertation. In all cases the writing must conform to the latest edition of *The MLA Style Manual* or the *APA Publication Manual,* depending on the nature of the research. In all cases the writing must conform to the current edition of the Graduate School *Guidelines for the Preparation of Research Reports, Theses, and Dissertations.*

Master's Degree Programs

A minimum of 30 semester credit hours is required for the M.A. or M.S. degree. At least 15 of these hours must be at the 500 level. A student who completes only the minimum of 30 hours of work may devote no more than 9 hours to work outside the Department of Speech Communication. However, a student may petition the graduate committee for a program to include 15 hours outside the department. Such outside work must be germane to one of the departmental curriculum areas for purposes of research and examination. Competence in one foreign language is required for the M.A. degree. Competence may be demonstrated by (1) E.T.S. examination, (2) achieving a grade of *B* or *A* in FR 488, GER 488, RUSS 488, or SPAN 488, or (3) achieving a passing grade in other approved foreign language courses on campus, a list of which is available in the department office. Current standards for passing the E.T.S. examination in French, German, Russian, or Spanish are available from the director of graduate studies.

A faculty adviser is named for the individual student before the end of the first semester. The faculty adviser and the student will plan the program of study. The program must consist of course work in at least three curriculum areas. In order to satisfy a given area of study, a student must complete at least 6 semester hours of work in that area. A course used for one curriculum area may not be counted toward another area. A comprehensive written examination is taken during the last semester of study.

The requirements for the master's degree may be met by either of the following plans chosen by the student in consultation with the adviser.

Plan 1: Thesis. Each student must complete a minimum of 30 semester credit hours, with no more than 6 hours or fewer than 3 hours of thesis credit in SPCH 599 counted toward the 30 hour minimum. In addition, the student must register for at least one semester hour of credit in SPCH 599 during any academic term in which the services of any faculty member are utilized in the supervision of or consultation concerning the thesis. If the student's reliance upon faculty assistance justifies, the director may require an appropriately greater number of credit hours in SPCH 599. The thesis is submitted to a committee of three

members of the graduate faculty, at least two of whom must be from the Department of Speech Communication. The committee must approve the prospectus and will administer an oral examination over the thesis. Students are required to submit two copies of the thesis to the Graduate School, one copy to the Department of Speech Communication, and one copy to the thesis director.

Plan 2: Research Report. Each student must complete a minimum of 30 semester credit hours, with no more than 3 hours or fewer than 1 hour of research report credit in SPCH 595 counted toward the 30 hours minimum. A research report is submitted as evidence of research competence. This paper should be based on a special project or specific courses as recommended by an advisory committee composed of the student's adviser and one other member of the graduate faculty in the Department of Speech Communication selected by the student and the adviser. This advisory committee must approve the research paper before it is submitted to the graduate committee and, then, to the Graduate School. One copy of the research report is submitted to the Graduate School, one copy to the Department of Speech Communication, and one copy to the adviser.

The subject of the thesis or research report must be in one of the curriculum areas chosen by the student. A student must have a graduate grade point average of 3.25 in order to be eligible for the master's degree.

Doctor of Philosophy Degree

A minimum of 42 semester credit hours of course work plus 9 hours of methodology (tool) courses beyond the master's degree and 24 semester credit hours of dissertation work are required for the Ph.D. degree. Course work outside the department must be germane to one of the departmental curriculum areas for purposes of examination and dissertation research. Throughout the program of study, the student must maintain a 3.25 grade point average in all work taken. If the grade point average drops below the minimum, the student is placed on academic warning for the following two semesters.

During the last half of the second semester of course work, the student's progress shall be reviewed by the advisory committee to determine continuation, change, or termination of the program. The advisory committee for each student shall be responsible for assembling the necessary information (grades, recommendations, progress in curriculum areas, etc.) for consideration in reaching the above decision.

Advisory Committee. A three person advisory committee shall be established during the first semester of graduate study to plan the program of study with each student. The chair of the committee shall act as the primary adviser and sign the graduate course request form. This advisory committee is responsible for certifying to the graduate committee that the student has met all departmental requirements for admission to candidacy and has passed the Ph.D. preliminary examination.

The advisory committee and the student will plan the program of study. The program of study focuses on at least one curriculum area. All students are required to take SPCH 501, Introduction to Speech Communication Research and SPCH 510, Rhetoric and Communication. Also students must take a minimum of 9 hours of methodology courses prescribed by the chosen curriculum area. Students selecting theater as a curriculum area must take 18 hours of speech communication courses including SPCH 501 and 510.

Attendance is required at proseminars as part of professional development. Graduate students are encouraged to present their scholarly work.

Preliminary Examination. The student must pass a preliminary examination on each of the declared curriculum areas in the program of study. The preparation and administration of the examination are determined by the advisory committee in consultation with the student. The examination is taken near the end of the course work.

Dissertation. Each student must register for at least 24 semester hours of dissertation credit in SPCH 600 or SPCH 601 or THEA 600 or THEA 601. In addition, the student must register for at least one semester hour of credit in SPCH 600 or THEA 600 during any academic term in which the services of any faculty member are utilized in the supervision of or consultation concerning the dissertation. If the students' reliance upon faculty assistance justifies, they may be required by the dissertation adviser to register for an appropriately greater number of credit hours.

The dissertation director shall, upon consultation with the student, be responsible for setting up a dissertation committee, supervising the dissertation, and administering the final oral examination. The dissertation committee shall approve the dissertation prospectus and pass upon the completed dissertation and oral examination. Students are required to submit two copies of the dissertation to the Graduate School, one copy to the Department of Speech Communication, and one copy to the dissertation director.

Interdisciplinary Program. Students who have been admitted to the doctoral program in speech communication and who wish to develop an interdisciplinary program, should review the guidelines set forth by the Graduate School. The graduate dean approves interdisciplinary Ph.D. programs only when they bear the endorsement of the principal sponsoring department. A student who wishes to apply for an interdisciplinary program in which speech communication will be the principal sponsoring department should understand that the program of study must include substantial involvement with courses in speech communication and that the department may require the student to meet other requirements similar to those established for the doctoral program in speech communication.

Telecommunications

The Master of Arts degree in telecommunications provides advanced professional training for students preparing for leadership positions in radio and television broadcasting, cable television, corporate video, and related fields. Content areas include the structure and organization of broadcast-related industries, mass media theories, economic and management perspectives, emerging new technologies, policy and regulatory issues, content criticism and review, programming innovations, international perspectives, and societal effects. Graduates of the program advance to leadership positions in broadcast stations, cable systems, production houses, corporate and public sector video departments, or teach in colleges and universities.

Admission

A baccalaureate degree is required from an accredited university for admission to the M.A. degree in telecommunications with preference given to those who have studied radio-television. For students coming from non-radio/TV backgrounds or whose preparation is lacking in certain areas, additional undergraduate course work may be required by the graduate faculty. Courses taken to satisfy deficiencies will not be counted towards the M.A. degree. Applicants must submit an application form obtained from the department, transcripts of all un-

dergraduate work, evidence of scholarship such as a research paper, and evidence of proficiency in a foreign language or computer programming. In addition, all applicants must fulfill the requirements for admission to the Graduate School.

Requirements

A minimum of 30 graduate credit hours is required for the M.A. degree in telecommunications. Of these, 6 hours must be taken in an outside department but related to the student's program and approved by the student's adviser. For example, courses in business administration may be chosen by students focusing their studies in the area of management. A minimum of 18 hours must be successfully completed at the 500 level or above. All students in the program are required to successfully complete RT 500 Introduction to Research in Telecommunications, RT 532 Telecommunications Research, RT 573 Telecommunications Management, RT 571 Telecommunications Policy. Students are also required to complete selected other 500 level courses in their major.

As a part of the 30 hours required for graduation, each student must select one of two options:

Plan 1. Thesis. Each student must complete a minimum of 30 semester credit hours including a traditional written thesis (RT 599, Thesis) which counts 3 to 6 hours in the program. An oral examination by the faculty advisory committee is given upon completion of the thesis.

Plan 2. Research report. Each student must complete a minimum of 30 semester hours including an individual research report (RT 591, Individual Study in Telecommunications) which counts 3 hours in the program. A research report is required which should be based upon supervised research or an independent investigative project approved by the student's advisory committee. An oral examination by the faculty advisory committee is given the student upon completion of the research report.

During the first semester of course work, the student will be appointed a major adviser and a committee of two additional graduate faculty members. The committee will work with the student to prepare a specific plan of study. The major adviser will also serve as the director of the student's thesis. In all instances students will be required to pass comprehensive examinations upon completion of course work and prior to work on the thesis.

Retention

A 3.0 grade point average in course work taken at the 400 level and above is required. It is expected that students will be in full-time residence for a minimum of one calendar year. A maximum of 12 hours of relevant transfer credit may be accepted into the student's program.

Theater

The Department of Theater blends scholarship and practice into an academically based theater experience preparing the student for a career in professional, education, or community theater. The extensive production schedule in two theaters—a proscenium house, the McLeod Theater, seating about 500 and a flexible space, the Laboratory Theater, seating about 100—provides training in all aspects of the theater augmented by courses in acting, voice, movement, directing, playwriting, production, design, and technical theater. Courses in theater history, dramatic theory and criticism, aesthetics, and specialized courses, e.g., children's theater and theater management, complement the

program. Students in design and playwriting concentrations are required to widen their horizons by appropriate courses outside the department. Seminars in international and ethnic theater and drama coordinated with ongoing research projects enhance the total experience.

The Department of Theater offers a graduate program of study leading to a Master of Fine Arts degree in theater. Doctoral study in theater is sponsored by the Department of Speech Communication. Interested students should consult the description of the program under speech communication.

Admissions

Two sets of forms—one to the Graduate School, another to the Department of Theater—must be submitted by the applicant. All forms should be requested from the director of graduate studies in theater. Applicants for graduate studies in theater must satisfy the minimum requirements of the Graduate School before being admitted to the department, which requires the submission of a personal and professional data form together with three letters of recommendation from former teachers or supervisors.

Although an undergraduate major in theater is not essential for admission to a graduate degree program in theater, the director of graduate studies may require that certain course deficiencies in undergraduate subject areas are remedied. These requirements are stated in writing on the admissions approval form.

There are additional requirements established by each of the four areas of study in the M.F.A. program. Applicants in the acting and acting/directing areas are interviewed and required to audition. Applicants in the production design/technical areas are required to submit portfolio samples of their work. Applicants in the playwriting area must submit examples of their writings. More detailed information about these requirements is obtainable from: Director of Graduate Studies, Department of Theater, Southern Illinois University at Carbondale, Carbondale, IL 62901, (618) 453-5741.

Financial Assistance

There are several kinds of financial assistance available to graduate students in the Department of Theater. First, there are graduate fellowships awarded on the basis of superior scholarship. Second, special fellowships are offered annually to students who show promise of success in graduate studies although their academic records have been only average due to economic disadvantages. The fellowships have no service requirements. Third, graduate assistantships (over $5,000 per academic year) are available to students who are employed in various academic support positions, such as teaching, researching, and in production. All fellowships and assistantships include a waiver of tuition (both in-state and out-of-state). Applications for financial assistance may be obtained by writing to the director of graduate studies.

The Master of Fine Arts Degree Program

The Master of Fine Arts degree program in theater emphasizes practical expertise in one of the following areas: acting, acting/directing, production design (separate concentrations in scenic, lighting, costume design, and technical direction), and playwriting. Coordination of cognate areas within the University structure offers the possibility of study in such interdisciplinary fields as dramatic literature, ethnic/international theater, and music theater, among others. In most instances, a minimum two year residency is required of all M.F.A. students.

All M.F.A. students must complete a minimum of 60 semester hours of course work, including the M.F.A. degree core requirements:

THEA 400 — 4 hours
THEA 500, 501 — 5 hours

Basic theater course in area — 3 hours
Total M.F.A. core — 12 hours

Besides the core requirements, the student will propose and successfully complete a project to qualify for further study in the chosen area. This project will be developed in concert with the student's committee consisting of three faculty members.

In addition, each of the four areas of study has specific area and elective requirements which are as follows.

Acting.
M.F.A. core (including THEA 417 or 517a) — 12 hours
Area requirements — 37 hours
Four semesters of Graduate voice — 8 hours
Four semesters of Graduate movement — 8 hours
Three semesters of Graduate acting — 9 hours
THEA 511 and 522 — 6 hours
THEA 599 — 6 hours
Electives (THEA 526a suggested) — 11 hours
Total: 60 hours

Acting / Directing.
M.F.A. core (including THEA 402a) — 12 hours
Area requirements — 32
THEA 402b, 502 — 6 hours
THEA 503a, b — 4 hours
THEA 513a, b — 4 hours
THEA 517a, b — 6 hours
THEA 511 or 522 — 6 hours
THEA 599 — 6 hours
Electives (by advisement) — 16 hours
Total: 60 hours

Production Design. (separate concentrations in scenic/lighting/costume design and technical direction)
M.F.A. core (including THEA 407) — 12 hours
Area requirements — 32
THEA 414, 418 — 6 hours
Area theater electives — 14 hours
THEA 511 or 522 — 6 hours
THEA 599 — 6 hours
Electives (by advisement) — 16 hours
Total: 60 hours

Playwriting.
M.F.A. core (including THEA 411a) — 12 hours
Area requirements — 32
THEA 402a or b, or 502 — 3 hours
THEA 411b, 511, 526b — 9 hours
THEA 504 or 505 — 3 hours
THEA 511 or 522 — 3 hours
THEA 454 or 550 — 2 to 3 hours
THEA 530 — 6 to 5 hours
THEA 599 — 6 hours
Electives (by advisement) — 16 hours
Total: 60 hours

Thesis requirements vary for each area of study; however, they include a research component as well as a description and evaluation of the student's creative project. In concert with the student's committee, the candidate may choose to separate the two, submitting an approved research paper during the first academic year and a creative thesis after completion of the M.F.A. final project.

The Department of Theater requires an oral examination, conducted by the student's thesis or dissertation committee, for each M.F.A. and Ph.D. degree candidate. The examination covers the thesis or dissertation, and may include questions designed to ascertain the student's general competence in theater.

Vocational Education Studies

The Department of Vocational Education Studies offers programs of study leading to the Master of Science in Education and Doctor of Philosophy degrees. Information about either program may be obtained by writing: Coordinator of Graduate Studies, Department of Vocational Education Studies, Southern Illinois University at Carbondale, Carbondale, IL 62901.

Master of Science in Education Degree

The master's degree with a major in vocational education studies is designed to accommodate a broad range of individuals preparing for teaching and non-teaching roles in education, business, industry, government, and other fields. The major consists of a minimum of 30 semester hours of course work organized into three components.

Professional Core Requirements. This consists of four courses: VES 561, VES 566, VES 580, and EPSY 402. Students are required to take a minimum of 9 hours (3 courses) from the core.

Speciality Area Courses. This consists of 12–18 semester hours of course work relevant to a student's career goals. Technical courses, professional courses, individualized study, and internships may be included. Courses may be taken within the department or in other units of the college or University.

Research Paper or Thesis. In accordance with Graduate School requirements, a research paper or thesis must be written showing evidence of the student's knowledge of research techniques. The majority of students select the research paper option. Students enroll in 3 semester hours of VES 593 to develop the research paper. Students choosing the thesis option will enroll for 6 semester hours of VES 599.

The program of study is individually tailored based on the student's background, interests, and career goals. Representative programs of study include: secondary teacher of vocational or practical arts education, post-secondary technical teacher, local director of vocational education, coordinator of cooperative vocational education, industrial trainer, employment and training specialist, manager of human resource development, and extension adviser. Upon completion of all requirements, a final oral or written examination covering the course work and research paper or thesis is conducted by the student's advisory committee.

Doctor of Philosophy Degree in Education

Advanced studies leading to the Doctor of Philosophy degree in education with a concentration in vocational education studies is offered through the Department of Vocational Education Studies. The concentration is a broad, general leadership, and professional development degree that caters to people having knowl-

edge, experience, and interests in the fields of: (a) vocational and technical education, (b) career education, (c) employment and training, or related fields. Even though many students who enter the program have a specific service area identity (e.g., agriculture education, business education, health occupations education, home economics education, industrial education), the degree is not awarded in a service area specialty.

Within the vocational education studies concentration a student may select one of three areas of specialization: (a) management, (b) professional development, or (c) research. The specialty area should be chosen based on the student's background, interests, and future career goals.

Persons seeking admission to the program must meet all requirements for admission established by (a) the Graduate School of the University, (b) the College of Education, and (c) the Department of Vocational Education Studies. It is required that applicants possess a background of academic and professional experience which will provide a basis for advanced study and research. More specifically, the program is designed for individuals with a background and experience in teaching, program administration, or training and development. Admission to the concentration is determined by a screening committee composed of a minimum of three members of the graduate faculty of the Department of Vocational Education Studies.

The program of study consists of 64 hours beyond the master's degree and includes an 8-hour professional seminar sequence in the College of Education, a 15-hour departmental core, 17 hours of supportive studies which may include an internship, research tool competence, and 24 hours of dissertation credit.

Zoology

The Department of Zoology's teaching and research programs are supported by appropriate courses, equipment, and facilities in a modern life science building. Available are an electron microscope complex, a centralized animal holding unit, a variety of sophisticated computer facilities, shops for design and construction of research equipment, Morris Library with approximately 1.8 million volumes, specialized research laboratories, and significant research collections. In proximity to the central campus are experimental ponds, wildlife enclosures, and natural laboratories. The Cooperative Fisheries and Wildlife Research laboratories, closely allied with the Department of Zoology, make important contributions to research facilities and research appointments for graduate students. The geographic location, physiographic features, and prevailing land use practices of southern Illinois and adjacent states offer unequaled opportunities for the use of natural and man-made environments in teaching and research. Of special value are the numerous refuges and parks, a national forest, large acreages of surface-mined lands, and a variety of streams and lakes. The Department of Zoology offers the Master of Arts, Master of Science, and the Doctor of Philosophy degrees. These degrees are awarded on the basis of demonstrated scholarship and the ability to organize, conduct, and report original research. Opportunities are available for experience in teaching and research.

Admission

Applicants for all graduate degrees must fulfill the requirements of the Graduate School.

Applicants for the master's degree must possess the following academic background: 24 semester hours in courses covering the basic principles of zoology; one year of college chemistry (organic or biochemistry is also desirable); one year of college mathematics including college algebra and trigonometry (calculus and

statistics are desirable). A grade point average of 2.70 (*A* = 4.0) or above. Applicants with less than 2.70 will be considered on individual merit.

Applicants for the doctoral degree must demonstrate a sound background of academic training in the animal sciences; hold a master's degree or its equivalent and have a grade point average in graduate work of 3.25 or above. Accelerated entry after one semester in a master's degree program is possible for students demonstrating exceptional potential.

Inquiries should be directed to the director of graduate studies in zoology. Separate applications must be made to the Graduate School and to the Department of Zoology. A completed departmental application for admission includes: departmental application form, transcript of all previous college credits, scores from the aptitude test of the Graduate Record Examination, and three letters of evaluation relative to professional and academic competence. All applicants will be notified of the action taken on their application by the director of graduate studies in zoology.

Advisement

Following admission to the department, and prior to registration, a student should consult appropriate faculty (representing student's area of interest) or the director of graduate studies in zoology for assistance in registration. Each student must arrange with a faculty member to serve as an adviser no later than the end of the first semester of registration in the program. A change in the adviser will be coordinated by the director of graduate studies in zoology at the request of the student and with the approval of the current and prospective professors.

Following selection and approval of an adviser, an advisory and research committee is to be recommended to the director of graduate studies in zoology for approval by the graduate dean. For the master's degree, the committee shall consist of a minimum of three members, one of whom may be from outside the department, with the adviser serving as chair.

For the doctoral degree the advisory and research committee shall consist of five faculty members, one of whom must be from outside of the department. The adviser shall serve as chair.

A program of course work and research tools as required must be approved by the advisory and research committee, and made a part of the student's departmental file no later than the first week of the second semester of registration in the program.

A research plan approved by the student's advisory and research committee must be placed in the student's departmental file prior to registration for ZOOL 598, 599, or 600 and no later than the end of the second semester of registration in the program.

While pursuing the completion of degree requirements, continuous registration is expected until such time as the degree has been completed. The number of hours required per session will reflect the extent of the demand for use of time and University and department facilities and academic personnel.

Academic Credit

Audited courses may not be counted toward completion of minimum hour requirements toward the degree. No course with a grade below *C* will fulfill minimal requirements of the degree. A petition for the use of transfer credits must be approved by the student's advisory and research committee and submitted to the director of graduate studies in zoology for forwarding to the dean of the Graduate School for approval.

Master of Science Degree

A minimum of 30 hours of graduate credit is required beyond the bachelor's degree including at least 18 hours of formal course work in Zoology and 6 hours of ZOOL 599.

In addition, one of the following tools is required: a foreign language either by completion of FL 488 with a grade of *A* or *B* or a score of at least 465 on the ETS proficiency exam, or two semesters of one of the following: statistics, computer science, mathematics, biochemistry, or biotechnology.

A thesis embodying results and analysis of original research and a final examination are required.

Master of Arts Degree

A minimum of 38 hours of graduate credit is required beyond the bachelor's degree including at least 24 hours of formal course work in zoology, and 2 hours of ZOOL 598. A research paper demonstrating the ability of the student to collect and analyze data and report results in a scientific manner is required. A library research problem is acceptable but must include an original contribution in the form of correlations and interpretations. A final examination is required.

Required Level of Performance in Master's Degree Program. A cumulative grade point average of at least 3.0 must be attained during the first two semesters in all graduate level work, and must be maintained thereafter. Failure to meet this requirement will result in loss of any financial support provided by the department. A grade of *C* or better must be earned in all background (undergraduate) courses to remove deficiencies.

Final Examination.

1. Each candidate for a master's degree is required to pass a final examination. The examination will be oral and should be taken no later than four weeks before graduation.
2. The examination consists of two parts:
   a. Presentation of the results of the research in a seminar.
   b. A closed session of inquiry by the student's advisory and research committee following the seminar.

Graduation. Candidates for a master's degree must follow and fulfill all Graduate School procedures and requirements for processing one's application for graduation.

The Ph.D. Degree

There is no minimal credit hour requirement beyond the Graduate School's residency and dissertation hour requirements. A student in consultation with an adviser prepares a program of study including courses in the major, in the minor, in areas of deficiency, and to complete the research tool requirement. This program when approved by the student's advisory and research committee is filed with the director of graduate studies in zoology.

Acceptable tools include foreign language, statistics, computer science, mathematics, biochemistry, and biotechnology. Normally two tools are required; however, one tool with exceptional expertise may satisfy the requirement if approved by the student's committee (exception: English as a second language). A student may qualify in a foreign language by completion of FL 488 with a grade of *A* or *B* or a score of at least 465 on the ETS proficiency exam. To qualify in statistics, a student must have course work through multiple regression analysis, which is GUID 506 and 507. In computer science a student should take CS 200 and one of the following: 129, 215, 220, and 470. For the tool requirements in mathematics,

biochemistry, and biotechnology, the student will arrange a program of two or three courses acceptable to the advisory committee. Previously acquired skills or knowledge may satisfy the tool requirement if the student passes an appropriate proficiency examination.

A 3.25 grade point average in graduate level course work must be maintained; failure to meet this requirement will result in loss of any financial support provided by the department. No course in which the grade is below *C* is acceptable for credit.

Preliminary Examinations. These examinations (oral and written) are taken after the tool requirement and a major portion (approximately 80 percent) of formal course work are completed, usually at the end of the second year of graduate study. The student with the approval of the adviser, advisory committee, and the director of graduate studies in zoology registers with the chair of the preliminary examination committee to take the examination. The written examination evaluates basic competence in zoology, and the oral portion emphasizes the area of specialization and minor.

Dissertation. The nature of the research to be used for the dissertation is established in consultation with the student's adviser, and is approved by the advisory and research committee. An approved copy of the research proposal is filed with the director of graduate studies in zoology. The student is required to register for a minimum of 24 semester hours in ZOOL 600, Dissertation Research. The dissertation is evaluated by the student's advisory and research committee, reviewed for approval by the chair and submitted to the graduate dean for final approval.

Final Examination. Upon approval of the dissertation by the student's advisory and research committee, the candidate requests the director of graduate studies in zoology to schedule a seminar and a final examination. Following the seminar, the final examination over the dissertation is conducted by the student's committee. Both the seminar and examination are open to the public.

Graduation. Candidates for a Ph.D. degree must follow and fulfill all Graduate School procedures and requirements for processing one's application for graduation.

3 Course Descriptions

In this chapter 400- and 500-level courses offered by Southern Illinois University at Carbondale are described. Courses are listed numerically within each subject-matter area. Areas are listed alphabetically.

The first entry for each course is a three-digit identification numeral. Courses numbered 400-499 are open to both seniors and graduate students, unless designated otherwise. Courses numbered above 499 are for graduate students only.

Following the course identification number is another number which indicates maximum credit allowed for the course. The maximum may vary, and specific semester hours may be assigned for each term a course is offered.

Following the course title and description may be prerequisites which must be satisfied before a student will be permitted to enroll. Graduate students will not receive graduate credit for Pass/Fail grades taken at the 400 level. Graduate credit is awarded for 500-level courses which have been approved to be graded *S/U* (Satisfactory/Unsatisfactory) only.

All courses offered in a specific term will be listed in the appropriate Schedule of Classes, which is published for each summer, fall, and spring term. Schedules are available at registration centers on campus and by mail from University Electronic Communications, Southern Illinois University at Carbondale, Carbondale, IL 62901. For mail orders, please specify year and term.

Accountancy

421-3 Advanced Accounting. Accounting principles and procedures relating to specialized topics, including partnership equity, installment and consignment sales, fiduciaries, international operations, branches, and business combinations. Prerequisite: junior standing and limited to accounting majors or consent of school; a grade of **C** or better in 322.

422-3 Current Development in Accounting Theory. Critical analysis of current developments in accounting theory, especially as reflected in the publications of major accounting associations. Prerequisite: junior standing and limited to accounting majors or consent of school; 322 with grade of *C* or better.

431-3 Advanced Cost Accounting. Managerial decision making; profit planning and control through relevant costing, return on investment and transfer pricing, determination of cost behavior patterns, analysis of variances, capital budgeting, inventory models, probabilities, statistical methods, and operations research. Prerequisite: junior standing and limited to accounting majors or consent of school; 331 with grade of *C* or better.

441-3 Advanced Tax. Study of income tax problems which arise from sole proprietorship, partnership, corporation, estate, and trust of organization. Brief study of social security, federal and state estate tax and gift tax. Student does research in source materials in arriving at solutions of complicated problems. Prerequisite: junior standing and limited to accounting majors or consent of school; 341 with grade of *C* or better.

451-3 Advanced Accounting Information Systems. A review of current systems design and operation methodologies with special attention to the advantages and disadvantages these provide to an integrated information system. Prerequisite: junior standing and limited to accounting majors or consent of school; 351 with grade of *C* or better.

461-3 Advanced Auditing. The study and application of selected auditing concepts and techniques. Hands-on application will be emphasized. Prerequisite: junior standing and limited to accounting majors or consent of school; 361 with grade of *C* or better.

471-3 Accounting for Public Organizations. Financial and managerial accounting concepts peculiar to the planning and administration of public and quasi-public organizations, such as gov-

ernmental units, institutions, and charitable organizations. Includes the conventional budgetary-appropriation process, as well as some of the more recent accounting developments related to public decision making. Prerequisite: 230 with grade of *C* or better.

512-3 to 18 (3 per topic) Accounting Research Methods Seminar. An advanced seminar critically analyzing research methods employed to study problems existing in a subarea of accounting thought, which may be repeated for credit in terms of sections (a) through (f). Sections (a) through (f) may be taken only once each. **(a)** Auditing, **(b)** financial accounting, **(c)** managerial accounting, **(d)** not-for-profit accounting, **(e)** accounting information systems, **(f)** taxation. Prerequisite: BA 513 or consent of the school.

521-3 Emerging Issues in Accountancy. Identifies developing areas in financial accounting and forces students to research the issues, to think critically, evaluate alternatives, and communicate conclusions in oral and written form. International accounting, not-for-profit, standard setting and regulation, and other developing issues are addressed. *The Journal of Accountancy*, other professional journals, and guest speakers. Prerequisite: 321, 322, or consent of instructor.

522-3 Financial Accounting Theory. Contemporary advanced accounting theory, including controversial issues with emphasis on net income determination and asset valuation; particular attention given to current publications of the professional and government agencies. Prerequisite: 521 or consent of instructor.

529-3 Seminar in Financial Accounting. Discussion of differences in accounting practices in a variety of major industry groups. Prerequisite: 521 or consent of instructor.

531-3 Controllership and Policy. Duties and responsibilities of a controller; key role of the management control system in the controllership concept; information for managerial formulation of goals, objectives, policy, and programming; unique control problems for service, not-for-profit, and multinational companies; cybernetics behavioral considerations and administrative decision issues. Prerequisite: 331 or consent of instructor.

532-3 Advanced Management Accounting. Management planning and control decisions and design and evaluation of management accounting systems requiring formal models and application of vigorous analytic reasoning. Integration and synthesis of techniques such as regression analysis, linear programming, decision theory, and behavioral science for important decisions of the form. Information economics. Contemporary research directories. Prerequisite: enrollment in M.Acc. or M.B.A. program or consent of instructor.

541-3 Tax Concepts. Provides the student with an understanding of the nature of the federal tax law and an appreciation of the law's impact upon business decisions both for individuals and companies. Prerequisite: 341 or consent of instructor.

542-3 Tax Research and Procedure. Provides the student with a working knowledge of the tax practitioner's methodology applied to the solution of both routine and complex tax problems. Prerequisite: enrollment in M.Acc. program or consent of instructor.

543-3 Corporate Taxation. Provides students with in-depth exposure to federal income taxation of corporations and shareholders. Areas explored are corporate formations, distributions, redemptions, liquidations, subchapter S election, corporate income tax, accumulated earnings tax, personal holding company tax, and affiliated corporations. Prerequisite: enrollment in M.Acc. program or consent of instructor.

544-3 Partnership Taxation. Provides students with in-depth exposure to the federal income taxation of partnerships and partners. Areas explored are the definition of a partnership, acquisition of an interest, basis of interest, tax accounting for partnership operation, distributions, termination, sale or exchange of interest, collapsible partnerships, death or retirement, and tax shelters. Prerequisite: enrollment in M.Acc. program or consent of instructor.

545-3 Estate Planning. A comprehensive study of the various aspects of estate planning, including an analysis of the impact of the federal estate and gift tax laws. In addition, the role of wills, trusts, insurance, and other related legal topics necessary to formulate a comprehensive plan is emphasized. The case approach will be utilized wherever feasible. Prerequisite: enrollment in M.Acc. program or consent of instructor.

546-3 Seminar: Selected Tax Topics. Provides students with in-depth exposure to federal income taxation of selected topics. Topics will vary from semester depending upon instructor and topics of current interest. Prerequisite: 541 or consent of instructor.

547-3 Tax Accounting Principles. Provides linkage of accounting skills with tax knowledge through identification of significant differences between tax and financial accounting and selection of tax accounting principles having a significant impact on cash flows. Tax accounting problems for industrial, wholesale, and retail companies. Prerequisite: 541 or equivalent and 421.

548-3 Interjurisdictional Tax. Examination of tax accounting problems when taxable events transcend governmental boundaries. Compares use of transfer pricing for international tax purposes to use of allocation procedures for interstate tax purposes. Specific international tax problems of foreign persons, U.S. citizens living abroad, U.S. shareholders for foreign corporations, and other U.S. persons. Special problems related to interstate taxation. Prerequisite: 541 or equivalent and 531 or consent of the school.

551-3 Accounting Information Systems Concepts. Concepts and principles underlying the analysis, design, implementation, and control of information systems. Emphasizes designing and implementing particular computerized information systems for different purposes and uses, focusing on accounting information systems in financial, managerial, and entrepreneurial decision-making. Prerequisite: 331, 351, 361, or consent of instructor.

552-3 Accounting Information Systems II. Survey of the subsystems of a business information system and their integration. Specific attention will be given to the budgeting and planning systems and the accounting, marketing, and production subsystems. Prerequisite: 551 or consent of instructor.

561-3 Professional Dimensions of Accountancy. Study of ethical and professional conduct in the practice of financial and operational audits. Includes a detailed look at codes of ethics and conduct in public accounting, industrial accounting, internal auditing, governmental accounting, tax practice, and consulting. Prerequisite: 361 or consent of instructor.

562-3 Advanced Auditing Topics. Examination of state-of-the-art auditing topics including auditing EDP systems; microcomputer applications in analytical review procedures, internal controls, and tests of details; statistical techniques; operational and compliance auditing; and attestation engagements. Prerequisite: 561 or consent of instructor.

571-3 Not-For-Profit Accounting. The study of accounting principles and practices of schools, hospitals, governmental agencies, the arts, and other not-for-profit organizations. Emphasis is on financial reporting. Prerequisite: enrollment in M.Acc. program or consent of instructor.

590-3 Seminar in Accounting. Discussion of current accounting theories, principles, standards, and problems. Prerequisite: enrollment in M.Acc. program or consent of instructor.

591-1 to 6 Independent Study. Directed independent study in selected areas of accountancy. Prerequisite: enrollment in M.Acc. program.

595-3 Internship. Supervised work experience in professional accounting. Prerequisite: outstanding record in accounting and recommendation of the department committee on internship. Graded *S/U* only.

599-3 to 6 Thesis. Prerequisite: enrollment in M.Acc. program.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Administration of Justice

The following courses are offered through the Center for the Study of Crime, Delinquency, and Corrections.

402-3 Group and Family Treatment in Criminal Justice. Presentation of theoretical knowledge and practical techniques utilized in major group and family treatment approaches for adults and juveniles in institutions, community-based correctional programs, and transitional living situations.

403-3 to 9 (3 per topic) Enforcement Operations. **(a)** Advanced investigation; **(b)** Enforcement management; **(c)** Enforcement discretion. This course offering provides a broad coverage of law enforcement activities from detailed investigative work through specialized management techniques required. Some sections of the course may be offered only every other year. Prerequisite: **(a)** 303 or graduate status; **(b)** 202 or graduate status or consent of instructor.

408-3 Criminal Procedure. An introduction to the procedural aspects of criminal law pertaining to police powers in connection with the laws of arrest, search and seizure, the exclusionary rule, civil liberties, eavesdropping, confessions, and related decision-making factors. Prerequisite: 310.

415-3 Prevention of Crime and Delinquency. Multidisciplinary analysis of the functions, goals, and effectiveness of measures to forestall delinquency and crime. Etiology of delinquent behaviors as related to community institutions such as police, courts, corrections, mental health clinics, schools, churches, and citizen groups. Prerequisite: 201 and 290 or consent of instructor.

450-3 Public and Private Security. An overview of important issues related to internal and external security and loss prevention. Covers security's historical development; its current role; different careers available; the prevention, detection, and reduction of hazards stemming from both internal and external sources; as well as certain administrative aspects.

451-3 Forensic Interrogation. Forum focusing on forensic interrogation; conceptual framework for understanding the behavioral and psychological aspects of the process; discussion of its historical and philosophical development, general use in criminal and private security investigations, legal proceedings, and importance in a democratic society. Students receive both theoretical grounding and hands-on experience. Prerequisite: consent of instructor.

460-3 Women and the Criminal Justice System. (Same as Women's Studies 476.) Addresses the topics of women as offenders, as victims and as workers in the criminal justice system. Prerequisite: 201 and 290 or consent of instructor.

472-3 The American Correctional System. (Same as Sociology 472.) A survey of the correctional field, covering probation, institutional treatment, and parole. Historical development, organizational structure, program content, and current problems. Prerequisite: 201 and 290 or consent of instructor.

473-4 Juvenile Delinquency. (See Sociology 473.) Prerequisite: 201 and 290 or consent of instructor.

474-3 Juvenile Justice. The evolving definition of juvenile misbehavior and the legal mechanisms that have emerged to control it. The problems and promise of juvenile justice in terms of the juvenile code and court, law enforcement, juvenile institutions both custodial and treatment, and community treatment. Prerequisite: none; 473 or equivalent recommended.

476-3 Crime and Criminal Justice: International Dimensions. Examination of sociocultural and political factors shaping criminality and responses to crime around the world. Similarities and differences in criminogenic conditions and practices of law enforcement and corrections are traced. Prerequisite: 201 and 290 or consent of instructor.

485-3 Corrections and the Community. Traditional correctional functions are redefined to emphasize development of resources of community

at large, diversion of convicted offenders from institutions, and direct involvement of correctional programs in community affairs. Prerequisite: three administration of justice courses or consent of instructor.

490-1 to 3 Independent Study in the Administration of Justice. Supervised readings or independent investigative projects in the various aspects of crime control, treatment of offenders; and management of programs of law enforcement, courts, and correctional agencies. May be repeated up to a maximum of three credit hours. Prerequisite: 201 and 290 or consent of instructor.

492-2 to 6 (2 to 3 per section) Contemporary Issues in Administration of Justice. A forum for focusing on special interest topics depending on the availability of staff, visiting professors, and other selected instructional resources to cover a contemporary issue of concern to students and the faculty. May re-enroll for a maximum of six credits. Prerequisite: 201 and 290 and consent of instructor.

500-3 Foundations of Criminal Justice. An exploration of the nature and scope of the criminal justice process. Criminal justice operations and behavior are assessed in context of the major theoretical, historical, normative, and organizational influences found in the field.

504-3 Criminological Theory. Multidisciplinary study of biogenic, psychogenic, and sociogenic explanations for criminal behavior relevant to policy-making and practice in criminal justice. Prerequisite: consent of instructor.

516-3 Scope and Method of Criminal Justice Inquiry. Principles of scientific inquiry applied to the study of crime and criminal justice. Examines the interrelationship of theory and research techniques, development of hypotheses and problem statements, different approaches to data collection, and research designs.

517-3 Seminar in Advanced Quantitative Techniques in Administration of Justice Research. Examination and application of multivariate analytic techniques often utilized in criminal justice research; including but not limited to multiple regression, multivariate analysis of variance, discriminant analysis, factor analysis, and log-linear and logistic modeling.

562-3 Fundamental Legal Concepts in the Administration of Justice. Includes the origin of rights, a review of the historical development and current use of civil rights; due process, equal protection, and cruel and unusual punishment; affirmative action, the limits of governmental action; and the application of these doctrines to various populations such as criminal justice personnel, prisoners, women, and minorities.

571-3 Correctional Systems in Criminal Justice. Evaluation of corrections as a system, its programmatic interrelationships and conflicts, and the probable course of its future development. Prerequisite: consent of instructor.

578-1 to 4 Seminar in Correctional Rehabilitation Counseling. Review of major issues and research relative to rehabilitation practices in youth and correctional settings. Prerequisite: consent of instructor.

580-3 Planning for Change in the Administration of Justice. Examines the planning of change in criminal justice. Presents perspectives and models used in understanding the dynamics of planned change and why change efforts succeed or fail. Discusses types of change strategies, targets of change, and levels of intervention with focus on broad-based organizational and system-level change.

582-3 Criminal Law and the Correctional Process. Basic principles and administration of the criminal law and the legal foundations of the juvenile court, the sentencing process, parole and probation, and the changing concept of mental competency. Includes statutory, case, and administrative law requirements of "due process" in correctional services.

584-3 Administration and Management in Criminal Justice. Focuses on the development and history of administrative theory and its impact on management techniques involving administration of justice bureaucracies.

587-3 Seminar in Law Enforcement. Multidisciplinary study of the philosophical premises, theoretical implications, and functions of contemporary law enforcement. Prerequisite: consent of instructor.

588-3 to 6 (3 per topic) Selected Topics in the Administration of Justice and Public Safety. **(a)** Personnel administration. Issues and processes in the education, selection, training, and promotion of administration of justice personnel are reviewed. **(b)** Policy and program evaluation. Examination of approaches and problems in the analysis and evaluation of criminal justice personnel, policy, and problems, with attention paid to both process and outcome analyses.

590-1 to 3 Supervised Readings in Selected Subjects. Readings supervised by a faculty member in a selected area of the Administration of Justice. Prerequisite: consent of a faculty sponsor.

591-1 to 6 Field Project Research. A requirement for the non-thesis option directed by a faculty committee. Usually represents an applied research project addressing an issue/problem confronted during supervised field work (AJ 595a and AJ 595b). Graded *S/U* only. Prerequisite: consent of graduate faculty advisor.

592-3 Advanced Seminar in Administration of Justice. Seminars of varied content for advanced students. Prerequisite: consent of instructor.

595A-3 or 6 Supervised Field Work (Internship). Experience in law enforcement agencies, juvenile courts, probation and parole departments, correctional institutions, delinquency control programs, and public or voluntary agencies. Orientation sessions precede placement. Student must submit internship application during the first 30 days of the preceding spring or fall semester. Graded *S/U* only. Prerequisite: consent of instructor.

595B-3 or 6 Supervised Field Work (Internship). Experience in law enforcement agencies, juvenile courts, probation and parole departments, correctional institutions, delinquency control programs, and public or voluntary agencies. Orientation sessions precede placement. Student must submit internship application during the first 30 days of the preceding spring or fall semester. Graded on a letter grade basis. Prerequisite: consent of instructor.

599-1 to 6 Thesis. Graded *S/U* only. Prerequisite: consent of academic coordinator.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Agribusiness Economics

Field trips are required for certain courses.

401-3 Agricultural Law. Relations of common-law principles and statutory law to land tenure, farm tenancy, farm labor, farm management, taxation, and other problems involving agriculture. Prerequisite: junior standing or consent of instructor.

402-1 to 6 Problems in Agribusiness Economics. Designed to improve the techniques of agribusiness economics workers through discussion, assignment, and special workshops on problems related to their field. Emphasis will be placed on new innovative and currently developed techniques for the field. Prerequisite: consent of chairperson.

440-3 Land Resource Economics. (Same as Economics 471.) The use of land as an economic variable in production of goods and services; land markets; public versus private land use conflicts; and land-use planning in an institutional setting. Prerequisite: 12 hours of agricultural economics or economics credit, or graduate status or consent of instructor.

444-3 Agricultural Development. Analysis of the economic, social, political, cultural, and institutional factors related to economic growth and development in agricultural sector. Framework for evaluating outcome of alternative strategies in agricultural production, marketing, and government policies that affect output, income distribution, and resource use in agriculture and the related agroindustrial complex. Prerequisite: 204.

450-3 Advanced Farm Management. Application of production economic principles and modern decision-making techniques to farm management problems. The importance of information, sources of agricultural risk and management of risk in farm planning will be integrated. Prerequisite: 350 or equivalent, and GED 107.

451-2 Farm Real Estate Appraisal. Principles and practices of farm real estate appraisal. Application of capitalization, market, and cost approaches for estimating market value. Understanding of special valuation methods used for buildings, insurance, assessments, loans, and condemnation. Field trips not to exceed $10. Prerequisite: 350 or consent of instructor.

453-3 Agribusiness Planning Techniques. Application of mathematical programming to agribusiness and farm planning, including enterprise selection, resource allocation, least cost ration formulation, decision making under risk and uncertainty, transportation and location problems. Emphasis placed on modeling problems and interpretation of results. Prerequisite: 350 or consent of instructor.

460-3 Agricultural Prices. Measurement and interpretation of factors affecting agricultural prices. Construction of index numbers, trend analysis, seasonal and cyclical price movements and the measurement of relationships between price and other variables. Prerequisite: 362 or equivalent.

461-3 Agriculture Business Management. Examination of agribusiness firm management with emphasis on the management and control of financial resources and the interrelationship between the agribusiness firm and human resource management. Other topics in agribusiness will include effective communication in the management process, business ethics, and workable credit programs for customers. Prerequisite: 351 and 360 or equivalent.

462-3 Advanced Agricultural Marketing. Advanced treatment of marketing issues from both theoretical and practical decision-making perspectives. Marketing margins, intertemporal, and spatial price relationships are reviewed in detail. Historical and current grain and livestock price series are utilized in decision-making exercises. Prerequisite: 362 or equivalent.

500-6 (3,3) Agribusiness Economics Research Methodology. (a) Social science research methodology in agriculture, including defining research problems, hypothesis formation, specification of research design, survey methodology, source of data, and development of research proposals. **(b)** A survey of applied techniques and procedures for developing and evaluating agricultural economic research models with an emphasis on multiple regression and time-series models. Prerequisite: EPSY 506 or equivalent.

551-3 Resource Allocation in the Agribusiness Firm. An examination of resource allocation in the agribusiness firm. Production decisions, agricultural product price analysis, and decision making models are considered. Prerequisite: six hours of agricultural economics or economics or consent of instructor.

552-3 Problems and Policies of the Agricultural Sector. An analytical survey of agricultural policy issues including agricultural price and income stabilization; international trade, capital and credit, the structure of agriculture, and the quality of life in rural areas. Prerequisite: six hours of agricultural economics or economics or consent of instructor.

581-1 to 4 Seminar in Agribusiness Economics. Seminar on current research and issues in agribusiness economics on topics such as farm management, farm policy, agricultural marketing, farm finance, agricultural prices, and international agriculture.

588-1 to 8 International Graduate Studies. University residential graduate study program abroad. Prior approval by the department is required both for the nature of program and the number of semester hours of credit.

590-1 to 4 Readings. Readings in specialized topics under the direction of an approved graduate faculty member. Graded *S/U* only.

593-1 to 4 Individual Research. Directed research in selected topics under the supervision of an approved graduate faculty member. Graded *S/U* only.

599-1 to 6 Thesis. Work in the research for and presentation of a thesis under the supervision of an approved faculty member. Graded *S/U* only.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Agricultural Education and Mechanization

Field trips are required for certain courses.

402-1 to 12 (1 to 6 per topic) Problems in Agricultural Education and Mechanization. **(a)** Agriculture education, **(b)** agriculture mechanization. Designed to improve the techniques of agricultural education and mechanization workers through discussion, assignment, and special workshops on problems related to their field. Emphasis will be placed on new innovative and currently developed techniques for the field. A limit of six hours will be counted toward graduation in master's degree program. Prerequisite: consent of chairperson.

411-3 Program Development in Agricultural Extension. Principles and procedures in developing extension programs with emphasis on program determination and methods. Prerequisite: junior standing.

412-3 Methods of Agriculture Mechanization. Theory and use of educational materials and devices adaptable to the needs and interests of educators involved in agricultural mechanization laboratories. There is a $15 laboratory fee for this course.

414-3 Adult Education Procedures, Methods, and Techniques. Determining adult education needs and interests of the community. Securing and organizing the information needed for adult education programs and planning teaching activities.

415-3 Beginning Teacher Seminar. The application in the professional field setting, of principles and philosophies of the education system. Includes application of principles of curricula construction, programming student and community needs. Prerequisite: consent of instructor.

418-3 Applications of Integrated Software/Agriculture. (Same as Vocational Education Studies 409.) Design of agricultural or educational applications of integrated software. Spreadsheet, database, wordprocessing, graphic and communications software will be applied to the solution of agricultural problems. Individual student projects will be the focus of the applied nature of the class. Prerequisite: junior standing or consent of instructor.

472-3 Agricultural Tractors and Engines. Tractor performance and selection, principles of operation, maintenance analysis, and tune-up of multi-cylinder farm type internal combustion engines. There is a $5 laboratory fee for this course.

473-2 Advanced Agricultural Electricity. Application of electricity to agricultural problems. An emphasis on principles of electrical distribution on the farm and/or the agribusiness operation. Planning the efficient usage of electricity. Prerequisite: 373 or equivalent.

474-3 Advanced Agricultural Structures. A study of design characteristics, construction, methods, and environmental control applicable to agricultural structures. Design construction and environment are considered from the standpoint of the function of the building of an agricultural enterprise. Prerequisite: 384 or equivalent.

483-3 Agricultural Materials Handling, Processing, and Storage. Arrangement of systems for animal waste disposal, feed handling and processing, and storage of agricultural products. Prerequisite: 373 or 384 or 473 or 474.

500-3 Agricultural Education and Mechanization Research Methodology. Social science research methodology in agriculture including defining research problems, preparing project proposals, and sources of data.

501-3 Recent Research in Agricultural Education. A study of recent research and development in agricultural education. The course includes an analysis of regional and national scholarly publications, procedures, and products. Prerequisite: graduate status and consent of instructor.

525-3 Program Development in Agricultural Education. Analysis and appraisal of current trends in agricultural education program development. Attention is given to implications for educators at the high school, post secondary, and in extension education positions. Offered each year, alternating spring and summer semesters.

526-3 Professional Development in Agricultural Education. Recent developments and trends in agricultural education are presented for review and discussion. The role of the agricultural instructor in determining educational priorities is emphasized. Offered each year, alternating fall and summer semesters.

571-3 Current Problems and Research in Agricultural Power and Machinery. A study and analysis of current problems, research findings, and innovations in agricultural power units and machinery. Prerequisite: 472 or equivalent.

581-1 to 8 (1 to 4 per topic) Seminar. **(a)** Agriculture education. **(b)** Agriculture mechanization. Study and discussion in selected topics under the supervision of an approved graduate faculty member. A maximum of four hours can be counted toward a Master of Science degree.

588-1 to 8 International Graduate Studies. University residential graduate study program abroad. Prior approval by the department is required both for the nature of program and the number of semester hours of credit.

590-1 to 4 Readings. Readings in specialized topics under the direction of an approved graduate faculty member. Graded *S/U* only.
593-1 to 4 Individual Research. Directed research in selected topics under the supervision of an approved graduate faculty member. Graded *S/U* only.
595-1 to 4 Agricultural Occupation Internship. Prepares coordinators to fulfill their responsibilities in selected areas in agricultural related occupations through an internship in the area of specialization and through orientation to related technical information. Prerequisite: consent of department.
599-1 to 6 Thesis. Work in the research for and presentation of a thesis under the supervision of an approved faculty member. Graded *S/U* only.
601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Agriculture

401-3 Fundamentals of Environmental Education. (Same as Forestry 401 and Recreation 401.) A survey course designed to help education majors develop an understanding of environmental problems and an awareness of how these types of problems can be handled both inside and outside the classroom. Prerequisite: ten hours of biological science, or ten hours of recreation and/or education, or consent of instructor.
423-3 Environmental Interpretation. (Same as Forestry 423 and Recreation 423.) Principles and techniques of natural and cultural interpretation. Two hours lecture, three hours laboratory. Approximately $10 cost for field trips. Prerequisite: ten hours biological science or ten hours of recreation.
450-2 Farming Systems Research and Development. An introduction to farming systems, which is an interdisciplinary approach to agricultural research and development emphasizing small farms. The whole farm is viewed as a system of interdependent components controlled by the farm household. Focuses on analyzing interactions of these components as well as the physical, biological, and socioeconomic factors not controlled by the household. Techniques of analysis are applicable domestically and internationally.
481-1 International Agricultural Seminar. Discussion of special topics relating to worldwide agricultural development. Prerequisite: consent of instructor.

Animal Science, Food and Nutrition

Animal Science

Field trips are required for certain courses.

409-4 Equine Science. Designed for students interested in the more scientific aspects of equine physiology and management. The class will take a more advanced look at anatomy and physiology of the systems of the equine and consider how they relate to selection, use, and management. Lecture and laboratory. Prerequisite: 219, 220, 331 or Physiology 310, or equivalent.
410-3 Meat Science. Chemical, physical, and nutritional properties of meat and meat products. Topics covered include muscle function, tissue growth and development, aspects of post mortem change including rigor mortis, meat microbiology, methods of analysis, and quality control. Prerequisite: 210, Chemistry 140 or equivalent, and a course in physiology.
414-2 Animal Feed Quality Control. Laboratory procedures for nutrient determinations used in animal feed quality control. Prerequisite: Chemistry 140 or equivalent.
415-3 Monogastric Nutrition. Advanced principles and practices involved in meeting nutrient requirements of monogastric animals. Prerequisite: 215 and 315.
416-3 Ruminant Nutrition. Practical knowledge gained of problems associated with digestion, absorption, and metabolism of nutrients as related to domestic ruminants, horses, and other pseudoruminants. Prerequisite: 215 and 315.
419-3 Stable Management. Designed for the advanced equine science student planning a career in the horse field. Teaches in-depth management techniques on an applied basis. Students will have the opportunity to learn both theory and application of management in one course. One hour lecture, four hours laboratory. Prerequisite: 219, 409, and consent of department.
420-4 Commercial Poultry Production. Principles and practices of management of broilers, layers, and turkeys as adapted to commercial operations. Field trip. Offered fall semester of even numbered years. Prerequisite: 315 or consent of instructor.
421-2 International Animal Production. A study of world animal production practices with emphasis on the developing countries. Adaptability of animals to environmental extremes and management practices employed to improve productivity. Prerequisite: junior standing plus ANS 121 or one year of biological science.
430-4 Dairy Cattle Management. Application of the principles of breeding, physiology, and economics to management of a profitable dairy herd. Breeds of dairy cattle, housing, milking practices, and quality milk production. Field trip. Students enrolled will incur field trip expenses of approximately $25. Prerequisite: 315, 332.
431-4 Reproductive Physiology of Domestic Animals. Comparative anatomy and physiology

of the male and female reproductive system of domestic animals; hormones; reproductive cycles; mating behavior; gestation and parturition; sperm physiology; collection and processing of semen; artificial insemination, pregnancy tests; diseases. Prerequisite: 121 or a course in physiology.

432-2 Quantitative Inheritance of Farm Animals. A review of the genetic principles underlying changes in animal breeding population; interpretations of gene frequency, heritability, and genetic correlations; application of selection and breeding systems in farm animals. Prerequisite: 332.

434-2 Physiology of Lactation. Anatomy and physiology of milk secretion; endocrine control; milk precursors and synthesis; milk composition; physiology and mechanics of milking, mastitis. Offered only fall semester of odd numbered years. Prerequisite: course in physiology.

455-2 Animal Waste Management. Acquaints the student with the scope and problems involved with animal waste management, current regulations and laws on environmental protection. Principles covering waste management technology and current livestock waste management systems are presented. Field trips will be scheduled. Prerequisite: junior standing.

465-4 Swine Production. Swine production systems and management techniques including breeding and selection, reproduction, nutrition, herd health and disease prevention, housing and waste management, marketing, production costs, and enterprise analysis. Field trip. Prerequisite: 315 and 332 or consent of instructor.

480-3 Sheep Production. Breeding, feeding, and management of sheep. Field trip. Prerequisite: 315.

481-1 Current Topics in Equine Science. Seminar exploring selected topical concerns in the horse industry. Students will prepare and present an individual seminar on current scientific work in the equine area. Such areas of study might include but are not limited to behavior, nutrition, reproduction, management, veterinary advances, and general and exercise physiology. Prerequisite: 419.

485-4 Beef Production. Beef cattle production systems and management, breeding and selection, reproduction, nutrition, and herd health with emphasis on the most economical and efficient systems. Field trip. Students enrolled will incur field trip expenses of approximately $5. Prerequisite: 315 and 332 or consent of instructor.

500-3 Research Methods in Agricultural Science. Experimental design and biometry as applied to biological and allied fields. Prerequisite: graduate student.

502-2 Surgical Research Techniques in Farm Animals. Basic methods of experimental surgery and sampling of biological materials in research on farm animals. Practice of techniques discussed in the lectures. Prerequisite: consent of instructor.

506-3 Instrumentation Methods in Agricultural Science. Basic methods and techniques of spectrophotometric and chromatographic instrumentation are taught in the lectures with application of instruments carried out in the laboratories. Prerequisite: consent of instructor.

515-3 Energy and Protein Utilization. Energy and protein utilization including digestion, absorption, and metabolism as related to domestic animal production. Prerequisite: CHEM 344 and 345.

516-3 Minerals and Vitamins in Animal Nutrition. Basic and applied principles of mineral and vitamin metabolism. Emphasis on metabolic functions, reaction mechanisms and interrelationships. Prerequisite: CHEM 344 and 345.

531-2 Topics in Theriogenology. Current research topics in reproduction of domestic mammals are discussed in relation to improving production technology. Emphasis is on neural and endocrine control mechanisms that may be modified to increase animal productivity. Prerequisite: 431.

581-1 to 2 (1,1) Seminar. Problems relating to various phases of animal industries. Maximum of one hour per semester.

588-1 to 8 International Graduate Studies. University residential graduate study program abroad. Prior approval by the department is required both for the nature of the program and the number of credit hours.

590-1 to 3 Reading in Animal Industries. Reading in specialized fields under direction of approved graduate specialists.

593-1 to 3 Individual Research. Investigation of a problem in animal science under the supervision of an approved graduate specialist.

599-1 to 6 Thesis. Credit is given for a master's thesis when it is accepted and approved by the thesis committee.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Anthropology

400A-3 Theory and Method in Physical Anthropology. Current topics in biological evolution and variation, including the theoretical and methodological background to each. Topics will be drawn from the four major areas of physical anthropology: genetics and evolutionary theory, primate studies, human fossil record, and human variation. Prerequisite: 300A for undergraduates or consent of instructor.

400B-3 Theory and Method in Linguistic Anthropology. History of linguistic anthropology. Description and analysis of languages. Origin, development, and acquisition of language. Theory of symbolic systems. Human and animal communication. Historical linguistics. Languages in culture and society. Prerequisite: 300B for undergraduates or consent of instructor.

400C-3 Theory and Method in Archaeology. Overview of the currents and controversies in anthropological archaeology in their historical and theoretical context. Topics include history of archaeological theory, explanation in archaeology, limitations of the archaeological record, and

archaeological approaches to the study of cultural variation. Prerequisite: 300C for undergraduates or consent of instructor.

400D-3 Theory and Method in Sociocultural Anthropology. Overview of contemporary approaches to social and cultural research in anthropology. Attention is given to such topics as structural functionalism, cultural ecology, dialectical and cultural materialism, ethnoscience, sociobiology, neo-Darwinism, symbolism, and cross-cultural comparison. Problem areas investigated include kinship, social structure, comparative economics, political organizations, religion, culture and personality, environmental adaptation, cultural change. Prerequisite: 300D for undergraduates or consent of instructor.

402-3 People and Culture. Offered primarily for non-anthropology majors. Focuses on the nature of culture, cultural processes, and cultural change with emphasis on social, political, economic, artistic, religious, and linguistic behavior of humans as individuals and in social groups.

404-3 Art and Technology in Anthropology. An introduction to the basic ways in which people utilize the natural resources of their habitat to meet various needs, such as food, shelter, transportation, and artistic expression. The nature of art, its locus in culture, and its integration into technical society will be considered.

406-3 Conservation Archaeology. The method and theory of archaeology in relationship to local, state, and federal laws regarding the protection and excavation of antiquities. Emphasis is on problem oriented survey and excavation, as well as the preparation of archaeological contracts and the writing of reports to satisfy statutes involving environmental concerns. Prerequisite: 300C or 400C or consent of instructor.

409-3 History of Anthropology. The development of anthropological thought in the four subfields of the discipline (sociocultural, physical, linguistics, archaeology). Emphasis is on concepts, ideas, and work and major practitioners of the early 19th to the middle of the 20th centuries, and on the major trends that have led to specialties found in anthropology today. The present status of anthropology as an academic discipline is briefly explored, and an attempt is made to assess the future of the discipline in terms of intellectual and practical concerns.

410A-3 Applied Anthropology. The practical applications of theoretical social anthropology. Problems of directed culture change are examined from an anthropological perspective as they apply to the work of the educator, social worker, extension agent, administrator, and others who are attempting to guide change in the life ways of others in Western culture and the third world. Prerequisite: none. 300D recommended for undergraduates.

410B-3 Educational Anthropology. An examination of the cultural processes of formal and informal education, the use of anthropological premises in educational program design, bicultural-bilingual education programs, comparative American-non-American systems, and the teaching of anthropology. Prerequisite: none. 300D recommended for undergraduates.

410C-3 Economic Anthropology. The study of non-Western economic systems. Prerequisite: none. 300D recommended for undergraduates.

410D-3 Anthropology of Folklore. A comparative study of the role of folklore in various cultures of the world, with emphasis upon nonliterate societies. Analysis of motifs, taletypes, themes and other elements; comparisons between nonliterate and literate groups. Prerequisite: none. 300D recommended for undergraduates.

410E-3 Anthropology of Law. Anthropological thought on imperative norms, morality, social control, conflict resolution and justice in the context of particular societies, preliterate and civilized. Law of selected societies is compared to illustrate important varieties. Prerequisite: none. 300D recommended for undergraduates.

410F-3 Anthropology of Religion. A comparative study of (religious) belief systems, with emphasis upon those of non-literate societies. Examination of basic premises and elements of these belief systems, normally excluded from discussions of "Great Religions". Prerequisite: none. 300D recommended for undergraduates.

410G-3 Psychological Anthropology. Similarities and differences in personality structures cross-culturally including the historical development of this as an anthropological subdiscipline. Prerequisite: none. 300D recommended for undergraduates.

410H-3 Ethnomusicology of Oceania, Asia and Africa. A survey of theory, method, structure, organology, and cultural context of the ethnomusicology of Oceania, Asia, and Africa.

410I-3 Ethnomusicology of Middle East, Europe and the New World. A survey of theory, method, structure, organology, and cultural context of the ethnomusicology of Europe and the New World.

410J-3 Kinship and Social Organization. Universal features of non-Western systems of kinship terminology and social organization. Topics include the structure and functioning of kinship systems, lineages, clans, sibs, phratries, moieties, and tribal units. Prerequisite: none. 300D recommended for undergraduates.

410K-3 Ecological Anthropology. An examination of the relationship of past and present human populations in the context of their natural and social environments. Prerequisite: 300C and 300D or equivalent.

425-3 Cognitive Anthropology. The theory of culture as cognitive organization is explored. Among the topics are: Formal analysis of lexical domains, folk classifications and strategies, the problem of psychological validity, linguistic determinism and relativity, biogenetic and psycholinguistic bases of cognition, and the "new ethnography."

430A-3 Archaeology of North America. Detailed study of the early cultures of North America. Emphasis on the evolutionary cultural development of North America. Prerequisite: 300C or 400C or consent of instructor.

430B-3 Archaeology of Meso-America. Detailed study of the early cultures of Meso-America with emphasis on the evolutionary cultural development of Meso-America. Prerequisite: 300C or 400C or consent of instructor.

430C-3 Archaeology of the Southwest. Detailed study of the early cultures of the Southwest with emphasis on the evolutionary cultural development of the area. Prerequisite: 300C or 400C or consent of instructor.

430D-3 Archaeology of the Old World. Detailed study of the early cultures of the Old World with emphasis on the evolutionary cultural development of the area. Prerequisite: 300C or 400C or consent of instructor.

430E-3 Archaeology of the Eastern Woodlands. Detailed study of the early cultures of the North American Eastern Woodlands with emphasis on the evolutionary development of cultures. Prerequisite: 300C, 302, 400C or 430A or consent of instructor.

440A-3 Human Evolution. An advanced consideration of the fossil evidence for human evolution and evaluation of the various theories regarding the course of human evolution. Prerequisite: 300A or consent of instructor.

440B-3 Race and Human Variation. A consideration of the range, meaning and significance of contemporary human biological variation, including evolutionary and adaptive implications and the utility of the race concept. Prerequisite: 300A or consent of instructor.

441-6 (3, 3) Laboratory Analysis in Archaeology. **(a)** Emphasizes methods of analysis in archaeology as part of a larger research design created by the student. May be taken independently or as a follow-up to 496. **(b)** Emphasizes technical methods of the physical and natural sciences in archaeological analysis, as used in environmental reconstruction, dating, and for the investigation of production and exchange.

442-1 to 12 Working with Anthropological Collections. Management, curation, and analysis of anthropological collections as part of a research project created by the student. May be taken independently or as a follow-up to 450, 495, 496, or 597.

444-3 Human Genetics and Demography. A course in human genetics with an emphasis on population genetics and demography of modern and ancient human populations. Prerequisite: 300A, 400A or consent of instructor.

450-6 (3, 3) Museum Studies. A detailed study of museum operation to include **(a)** methodology and display and **(b)** administration, curation, and visits to or field work with area museums. Practical museum work will be stressed in both **(a)** and **(b)** and **(a)** must be taken before **(b).**

455-3 to 27 (3 per topic) Topics in Bioanthropology. Intensive study of one of the major subfields within biological anthropology. Topical areas include: **(a)** Dental Anthropology. **(b)** Laboratory Methods. **(c)** Primate Behavior and Ecology. **(d)** Quantitative Methods. **(e)** Biomedical Anthropology. **(f)** Human Growth, Development, and Adaptation. **(g)** Primate Biology and Evolution. **(h)** Osteology. **(i)** Comparative and Functional Primate Anatomy.

460-1 to 12 Individual Study in Anthropology. Guided research on anthropological problems. The academic work may be done on campus or in conjunction with approved off-campus (normally field research) activities.

470-3 to 24 People and Cultures. A survey of the prehistory, cultural history, and contemporary cultures of the area in question. Topical emphasis may vary from course to course and year to year. **(a)** Africa, (b) Asia, (c) Caribbean, **(d)** Europe, **(e)** Latin America, **(f)** Near East and North Africa, **(g)** North America, **(h)** Oceania. Prerequisite: a basic acquaintance with geography and history of the areas.

490-3 Field Methods and Analysis in Linguistic Anthropology. Includes theoretical background and a project in the linguistic aspects of culture. Prerequisite: 300B, 301, or 400B.

495-3 to 8 Ethnographic Field School. Apprentice training in the field in ethnographic theory and method. Students will be expected to devote full time to the field school. Prerequisite: consent of instructor.

496-1 to 8 Field School in Archaeology. Apprentice training in the field in archaeological method and theory. Students will be expected to be in full-time residence at the field school headquarters off campus. Prerequisite: consent of instructor.

501-6 (3,3) Practicum in Educational Anthropology. Provides anthropology students actual classroom experience in a lower division anthropology course. Students will be involved in the teaching of designated courses. The instructor of record will meet with practicum members on a regular basis, critique their lectures, and together with them work out problems and plan future direction of the course. Graded *S/U* only. Prerequisite: Ph.D. level or successful completion of core course requirements at the M.A. level.

510-2 to 6 (2 to 3 per topic) Seminar in New World Archaeology. From year to year, the areal and topical coverage of this course will vary, as will the instructors. Students should consult the department about subjects to be covered.

511-2 to 6 (2 to 3 per topic) Seminar in Meso-American Archaeology. From year to year, the areal and topical coverage of this course will vary, as will the instructors. Students should consult the department about subjects to be covered.

512-2 to 6 (2 to 3 per topic) Seminar in Old World Archaeology. From year to year, the areal and topical coverage of this course will vary, as will the instructors. Students should consult the department about subjects to be covered.

513-2 to 6 (2 to 3 per topic) Seminar in Archaeology. Seminars in varying topics in archaeology. Students should consult department about subjects to be covered.

515A-3 Seminar in Social-Cultural Anthropology. Discussion of anthropological concepts of social structure and related topical themes, based upon extensive reading selected from a large number of sources. Prerequisite: 409 or consent of instructor.

515B-3 Seminar in Social-Cultural Anthropology. Intensive analysis of a limited set of monographs organized around a theoretical problem or set of problems. Prerequisite: 409 or consent of instructor.

520-2 to 6 (2 to 3 per topic) Seminar in New World Ethnology. From year to year, the areal and topical coverage of this course will vary, as will instructors. Students should consult the department about subjects to be covered.

521-2 to 6 (2 to 3 per topic) Seminar in Ethnology of Latin America. From year to year,

the areal and topical coverage of this course will vary, as will the instructors. Students should consult the department about subjects to be covered.

522-2 to 6 (2 to 3 per topic) Seminar in the Anthropology of Oceania. From year to year, the areal and topical coverage of this course will vary, as will the instructors. Students should consult the department about subjects to be covered.

523-2 to 6 (2 to 3 per topic) Seminar in Anthropology of Africa. From year to year, the areal and topical coverage of this course will vary, as will the instructors. Students should consult the department about subjects to be covered.

530-2 to 6 (2 to 3 per topic) Seminar in Physical Anthropology. Seminars in varying topics in physical anthropology. Students should consult the department about subjects to be covered.

540-3 Pidgin and Creole Languages. (Same as Linguistics 507.) Survey of the world's pidgins and creoles, with emphasis on the English-based Atlantic creoles. Comparison of creolization with first and second language acquisition, and with the origin and evolutionary development of human language. Prerequisite: one previous course in linguistics or consent of department.

545-2 to 6 (2 to 3 per topic) Seminar in Anthropological Linguistics. From year to year, the areal and topical coverage of this course will vary, as will the instructors. Students should consult the department about subjects to be covered.

560-2 to 6 (2 to 3 per topic) Seminar in Comparative Social Organization. From year to year, the areal and topical coverage of this course will vary, as will the instructors. Students should consult the department about subjects to be covered.

562-2 to 6 (2 to 3 per topic) Seminar in the Anthropology of Contemporary Peoples. From year to year, the areal and topical coverage of this course will vary, as will the instructor. Students should consult the department about subjects to be covered.

565-2 to 6 (2 to 3 per topic) Seminar in Culture Change and Development. From year to year, the areal and topical coverage of this course will vary, as will the instructor. Students should consult the department about subjects to be covered.

567-2 to 6 (2 to 3 per topic) Seminar in Anthropological Theory and Method. From year to year, the areal and topical coverage of this course will vary, as will the instructors. Students should consult the department about subjects to be covered.

576-2 to 6 (2 to 3 per topic) Seminar in Anthropological Research Design. Supervised training in the preparation of anthropological research designs. Requirements will include completed research proposals involving the relation of data to theory and results in the general sub-areas of archaeological, physical, social, and linguistic anthropology. Coverage will vary. Students should consult the department.

581-2 to 6 (2 to 3 per topic) Seminar in Anthropology. From year to year, the areal and topical coverage of this course will vary, as will the instructor. Students should consult the department about subjects to be covered.

585-1 to 12 (1 to 3 per semester) Readings in Anthropology. Guided readings to cover special topics and fill gaps in the student's specialized anthropological background, to be arranged with department.

590-1 to 12 Internship in Conservation Archaeology. The purpose of this course is to allow pre-professional archaeologists to be introduced to an actual archaeological or administrative milieu. This will normally take the form of a supervised field project, but the project may be excavation, survey, or aspects of administration. Graded *S / U* only.

595-3 Field Methods in Ethnology. Anthropological methods of inquiry and documentation of cultures and habitat together with appropriate instruction in the technique of field work such as photography and sound recording.

597-1 to 12 Fieldwork in Anthropology. To be arranged with department. Graded *S / U* only.

599-1 to 6 Thesis.

600-1 to 32 (1 to 12 per semester) Dissertation.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S / U* or *DEF* only.

Applied Linguistics

(See Linguistics.)

Art and Design

Art studio courses (400–499, 500–598) are directed toward individual research in the student's major field. Emphasis is placed upon the history, materials, processes, and ideas that form the content and experience of the major field.

Courses in this department may require the purchase of supplemental materials. Permission of the major adviser in each studio is required for enrollment in studio courses.

400d-3 to 15 Advanced Drawing I. Independent study in drawing. Prerequisite: consent of major adviser. Studio fee: $5. Incidental expenses may exceed $50.

401d-3 to 15 Advanced Painting I. Independent study in painting. Prerequisite: consent of major adviser. Studio fee: $5. Incidental expenses may exceed $50.

402d-3 to 15 Advanced Printmaking I. Independent study in printmaking. Prerequisite: consent of major adviser. Studio fee: $10 per credit hour. Incidental expenses may exceed $50.

403d-3 to 15 Advanced Sculpture I. Independent study in sculpture. Prerequisite: consent of major adviser. Studio fee: contigent upon type of

materials used. Incidental expenses may exceed $75.

404d-3 to 15 Advanced Ceramics I. Independent study in ceramics. Prerequisite: consent of major adviser. Studio fee: $27 per credit hour enrolled. Incidental expenses may exceed $20.

405d-3 to 15 Advanced Metalsmithing I. Independent study in metalsmithing. Prerequisite: consent of major adviser. Studio fee: $10 per credit hour enrolled. Incidental expenses may exceed $75.

406d-3 to 15 Advanced Fibers I. Independent study in fibers. Prerequisite: consent of major adviser. Studio fee: $17 per semester. Incidental expenses may exceed $75.

407-3 Ancient Art. Ancient art of the Mediterranean area from the Egyptians to the end of the Roman Empire. A survey of the major cultures, with emphasis upon visual analysis, media and techniques, function, and icongraphy. Field trip required. Documented research paper on an aspect of ancient art required for graduate credit. Prerequisite: 207a or consent of instructor.

414-3 to 21 Glass I. A studio course designed for the beginning glass student focusing initially upon basic "flat glass" and cold working techniques and processes. Coursework includes projects intended to familiarize the student with designing and executing products in stained glass. Student will be introduced to forming techniques in glassblowing. Studio fee $20 per credit hour enrolled. Prerequisite: consent of instructor.

415-4 A Creative Look at Reclamation Possibilities for Massively Disturbed Land. Presents the possibility that massively disturbed areas can be aesthetic resources if potential inherent in these sites can be recognized and addressed. Seminar/lecture/studio format with selected lectures given by invited speakers. Discussions include recognition of massive land disturbance; reclamation as a concept; environmental art and design; the questions a potential developer or designer of disturbed land should ask and where they might look for expert advice; and group critiques on student studio projects. Studio projects will involve the visualization in two- and three- dimension formats of plans for the reclamation of the students' chosen site with accompanying documentation.

417-3 Medieval Art. Medieval art from the Fourth to the Fifteenth Century in Western Europe. Examination of selected art objects in terms of media and techniques, iconography, function, and cultural milieu. Field trip required. Documented research paper on an aspect of medieval art required for graduate credit. Prerequisite: 207a or consent of the instructor.

427-3 Renaissance Art. An examination of various topics appropriate to a study of Renaissance art, both Northern and Italian, during the Fifteenth and Sixteenth Centuries in Europe. The emphasis is on a range of art history problems and methods of approach. Field trip required. Prerequisite: 207a or consent of instructor.

437-3 Baroque and Rococo Art. An examination of various topics appropriate to a study of Baroque and Rococo art in Western Europe. Emphasis upon a range of art historical problems and methods of approach. Field trip required. Prerequisite: Art 207a or b or consent of instructor.

447-3 Introduction to Museology. A survey of museum and gallery techniques (emphasis upon practical exhibit development) which will involve answering questions concerning contractual agreements, taxes, insurance, packing, shipping, exhibit design and installation, record systems, general handling, public relations, and sale of art works directed toward problems encountered by the artist outside the privacy of the studio. Prerequisite: art major or consent of instructor.

457-3 Women in the Visual Arts. (Same as Women's Studies 427.) Consists of a survey of women's contributions and participation in the visual arts from the middle ages through the Twentieth Century. Through lecture, discussion and research, painting, sculpture, architecture, crafts, film, photography, and other forms of visual art will be covered. Screening fee: $10.

467-3 Critical Issues in Contemporary Art. An examination of the style and meaning of contemporary art in relation to the current political, social, and cultural issues. Will include visual arts, architecture, and communications media. Prerequisite: 207a and b or consent of instructor,

477-3 American Art of the Thirties. A sociopolitical and artistic study of American art during the decade of the Great Depression. Course material will be divided in three parts: (1) a survey of art trends during the Thirties concentrating on traditional art forms such as painting, sculpture, and architecture, (2) an investigation into government-subsized art programs, and (3) recent governmental and corporate patronage of the arts through such programs as the National Endowment for the Arts. Prerequisite: 207a and b or consent of instructor.

487-6 (3, 3) American Art. (a) U.S. art to 1913, study of American art from native Indian settlements through Colonial period to 20th Century. Attention to such art forms as painting, sculpture, and architecture, as well as the rich varied Indian folk and craft traditions. **(b)** U.S. art since 1876, study of American art and design from Industrial Revolution to present. Attention to such traditional art forms as painting, sculpture, and architecture, as well as the many facets of modern design. Prerequisite: 207a,b or consent of instructor.

497-3 to 6 (3 per topic) Problems in Art History. A close examination of selected categories of works of art from various periods, media, and cultures as illustrative of particular art historical problems. Topics will vary and include **(a)** portraiture, **(b)** landscape and still life, **(c)** narrative, **(d)** other selected topics. Sections **a** through **c** may be taken only once each, section **d** may be repeated as topics vary. Art historical perspectives to include formal analysis, iconography, art theory, social history, connoisseurship. Prerequisite: 300-level art history course or consent of instructor.

499-3 to 21 Individual Problems. Art studio course directed toward individual research in the student's major field. Emphasis is placed upon the history, materials, processes, and ideas that form the content and experience of the student's major field. Designed to adapt to students' individual needs in problem research. Prerequisite: senior standing in the School of Art and Design, a 3.0 average, and consent of instructor.

500-3 to 21 Advanced Drawing II. A studio directed toward individual research in the student's major field. Emphasis is placed upon the historical materials, processes, and ideas that form the content and experience of the student's major field. Prerequisite: consent of major adviser.

501-3 to 21 Advanced Painting II. Art studio course directed toward individual research in the student's major field. Emphasis is placed upon the history, materials, processes, and ideas that form the content and experience of the student's major field. Prerequisite: consent of major adviser.

502-3 to 21 Advanced Printmaking II. Advanced studio course in printmaking directed toward individual research in the student's choice of print media. Emphasis is on the processes which lead to the formation of personal content. Studio fee $13 per credit hour enrolled. Prerequisite: graduate status and consent of instructor.

503-3 to 21 Advanced Sculpture II. Advanced studio course directed toward individual research in the student's major field. Emphasis is placed upon the history, materials, processes, and ideas to form content in the student's medium. Incidental expenses may exceed $100. Prerequisite: consent of major adviser.

504-3 to 21 Advanced Ceramics II. Art studio course directed toward individual research in the student's major field. Coursework is designed to assist the student's discovery of ceramic form and content as applied to personal artistic expression. Emphasis upon the development of creative studio research techniques and seminar-type experiences exploring historical and contemporary issues as they relate to ceramic art. Studio fee $43 per credit hour enrolled. Incidental expenses may exceed $50. Prerequisite: consent of major adviser.

505-3 to 21 Advanced Metalsmithing II. Art studio course directed toward individual research in the student's major field. Emphasis is placed upon the history, materials, processes, and ideas that form the content and experience of the student's major field. Studio fee $10 per credit hour enrolled. Prerequisite: consent of major adviser.

506-3 to 21 Advanced Fibers II. Art studio course directed toward individual research in the student's major field. Coursework is designed to assist the student's discovery of fibers and content as applied to personal artistic expression. Emphasis upon development of creative studio research techniques and seminar-type experience exploring historical and contemporary issues as they relate to fibers. Studio fee $17 per credit hour enrolled. Prerequisite: consent of major adviser.

507-3 to 6 (3,3) Readings in Art History. Individual assistance and investigation to discover new meaning and involvement in graduate studio work through the literature of art.

508-2 to 9 (2 to 3, 2 to 3, 2 to 3) Research in Art Education. Each student demonstrates via class presentations, a term paper, surveys of research reports and formulations of research designs, an understanding of advanced art education research procedures, analyses and implications; new process and product research techniques; and research in artistic creativity, perception, and the evolution of art images. Prerequisite: consent of instructor.

514-3 to 21 Glass II. An advanced glass course intended to increase the student's knowledge of the potential of glass as a medium of creative expression and to refine studio skills associated with the material. Coursework will include the investigation of historical and contemporary solutions to aesthetic problems related to the medium. Studio fee $30 per credit hour enrolled. Prerequisite: consent of major adviser or consent of instructor.

517-3 to 6 (3,3) Concepts in Art History. Group seminar to discuss and present aspects of the history of art in relation to both traditional and contemporary artistic concerns.

518-2 to 9 (2 to 3, 2 to 3, 2 to 3) Seminar in Art Education. Each student shows evidence, via class presentation, a term paper and evaluations of individual and group projects, an understanding of important literature; the latest developments and trends in philosophical, psychological, and sociological concepts in art education and methods for developing rationale for art curriculum and instruction programs. Prerequisite: consent of instructor.

599-2 to 6 Thesis. Art studio course directed toward individual research in the student's major field. Emphasis is placed upon the history, materials, processes, and ideas that form the content and experience of the student's major field.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Behavior Analysis and Therapy

(See Rehabilitation.)

Black American Studies

There is no approved graduate program in Black American studies. Four-hundred-level courses may be taken for graduate credit unless otherwise indicated in the course description.

455-2 to 12 Rehabilitation Services with Special Populations.

465-3 Governments and Politics of Sub-Saharan Africa. (See Political Science 465.)

480-4 to 8 (4, 4) Seminar in Black Studies. Analysis of the black experience directed toward practical contribution in the area studied. Topics vary with instructor. May be repeated once for a total of eight credits provided registrations cover different topics. Topics announced in advance. Prerequisite: Black American Studies 109 or consent of department.

499-1 to 5 Special Readings in Black American Studies. Supervised readings for students with sufficient background. Registration by special permission only. Offered on demand. Prerequisite: consent of instructor.

Biological Sciences

(See Chapter 2 for description of the biological sciences program.)

Botany

(See Plant Biology)

Business Administration

Students desiring to enroll in these courses must be admitted to the Master of Business Administration, Master of Accountancy, or Doctor of Business Administration degree program or have permission of the associate dean for graduate study in business administration or accountancy.

410-3 Financial Accounting Concepts. Basic concepts, principles, and techniques used in the generation of accounting data for financial statement preparation and interpretation. Asset, liability, equity valuations and income determination is stressed. Prerequisite: Enrollment in MBA program or consent of department.

430-3 Business Finance. An introductory course combining both a description of the structure of business financing and an analysis of functional finance from a managerial viewpoint. Prerequisite: enrollment in MBA program or consent of department; 410, Educational Psychology 506, and MBA program "computer ability" foundation requirement met, or equivalent.

440-3 The Management Process. Analysis of management theories and the administrative process. Specific managerial activities are analyzed and discussed. Functional relationships in administered organizations are explored. Prerequisite: enrollment in MBA program or consent of department.

450-3 Introduction to Marketing Concepts. An overview of the role of marketing within an economic system and of the major marketing activities and decisions within an organization. Emphasis is on developing an understanding of the marketing process. Prerequisite: enrollment in MBA program or consent of department.

451-3 Methods of Quantitative Analysis. (Same as Mathematics 457.)

452-3 Operations Research. A survey of operations research techniques with emphasis on problem formulation, model building, and model solution. Topics include mathematical programming, waiting-line models, simulation, and decision theory. Prerequisite: enrollment in the MBA program or consent of department; 451, Educational Psychology 506 or equivalent.

470-3 Legal and Social Environment. An overview of the legal, social, and ethical dimensions which influence business with particular attention to the role of law as a control factor of society in the business world. Prerequisite: enrollment in MBA program or consent of department.

500-3 Research Applications in Business and Organizations. The analysis of actual problems in research: project design, data collection, analysis, interpretation, dissemination, and application in business and organizational settings. This includes an understanding of the proper utilization of appropriate research statistics and involves use of the computer for problem solving. Three lecture and two laboratory hours per week. Prerequisite: enrollment in M.B.A. program or consent of department; M.B.A. program foundation.

502-3 Business in our Capitalistic Society. Study of the external environment in which business in America operates; social, political, legal, and ethical dimension, inter-relationships, and requirements. Prerequisite: enrollment in M.B.A. program or consent of department; all M.B.A. program foundation.

510-3 Managerial Accounting and Control Concepts. Basic cost concepts, measures, methods, and systems of internal accounting useful for managerial planning, implementation, control, and performance evaluation. Includes cost analysis relevant for non-routine decision-making. Prerequisite: enrollment in M.B.A. program or consent of department; 410, and M.B.A. program "computer ability" foundation requirement met, or equivalent.

513-3 Accounting Concepts in Business Organizations. Accounting theory and practice as it applies to business and other organizations. Emphasis is on current problem areas in accounting and on research methods being used to resolve these problems. Prerequisite: enrollment in the D.B.A. program or consent of department.

519-3 Seminar in Accounting. Discussion of current accounting theories, principles, standards, and problems. Prerequisite: enrollment in M.B.A. program or consent of department.

520-3 Production/Operations Management. A survey of the design, operation, and control of systems that produce goods and services. Topics include forecasting, production planning, facility location and layout, inventory management, scheduling, and quality control. Prerequisite: enrollment in M.B.A. program or consent of department; 452 or equivalent.

521-3 Business Conditions Analysis. Emphasis is given to macro-economic theory as it affects economic forecasting. Particular emphasis is given to GNP forecasting models, industry forecasts, and forecasting for the firm. Prerequisite: enrollment in M.B.A. program or consent of department; 430 or equivalent.

526-3 Managerial Economics. Develops conceptual framework for business decision making with emphasis on demand, costs, prices, and profits. Prerequisite: enrollment in M.B.A. program or consent of department; 451 and Educational Psychology 506 or Mathematics 458 or equivalent.

530-3 Financial Management. A study of financial principles and practices with special emphasis on their relation to managerial planning and control. Prerequisite: enrollment in M.B.A. program or consent of department; 430, 510, and either 526 or ECON 441, and 440, or equivalent.

531-3 Advanced Financial Management. An evaluation of selected financial policies connected with the acquisition and disposition of funds by the firm. An emphasis is placed on quantitative solutions to these problems. Prerequisite: enrollment in M.B.A. program or consent of department; 430 or equivalent.

532-3 Financial Institutions and Markets. The principal financial institutions and markets will be studied in relation to their contribution to the efficient operation of the individual enterprise and the total company. Prerequisite: enrollment in M.B.A. program or consent of department; 430 or equivalent.

533-3 Investment Concepts. A study of fixed return and variable return securities, investment services, industry and issue analysis, empirical studies of groups and individual stock price movements. Prerequisite: enrollment in M.B.A. program or consent of department; 430 or equivalent.

534-3 Financial Decision Making. Study of the scope and nature of advanced financial decision making and the application of quantitative tools and techniques to decisions relating to working capital, fixed assets, cost of capital, value of the firm, and financial structure. Prerequisite: enrollment in the D.B.A. program or consent of department.

536-3 Advanced Financial Analysis. Deals with examination of classical and various modern treatments of investment, valuation, cost of capital, and capital structure. Portfolio, state-preference, capital markets, options pricing, mergers, and exchange rate theories are explored. Prerequisite: enrollment in M.B.A. or D.B.A. program or consent of department; 430 or equivalent.

539-1 to 15 Seminar in Finance. A series of doctoral seminars on theoretical and empirical issues in finance. Sections (a) through (d) may be taken only once. Section (e) may be repeated as topics vary. **(a)** Corporate financial theory. **(b)** Financial institutions and markets. **(c)** Portfolio theory and speculative markets. **(d)** International financial theory. **(e)** Selected topics. Prerequisite: enrollment in D.B.A. program or consent of department.

540-3 Managerial and Organization Behavior. Case analyses of human problems in the business organization. Application of findings of behavioral science research to organization problems. Development of direction and leadership skills. Prerequisite: enrollment in M.B.A. program or consent of department; 440 or equivalent.

541-3 Operations Research II. Continuation of the survey of topics and approach taken in 452. Problem formulation; model building and elementary mastery of state-of-the-arts solution techniques are emphasized. Topics include integer programming, traveling sales representative problems, probabilistic programming, queuing, simulation and inventory theory. Prerequisite: enrollment in M.B.A. program or consent of department; 452 or equivalent.

543-3 Personnel Management. An overview of the field of personnel administration, based on a review of the relevant literature and on practice in simulations of problems typically encountered in the field. Prerequisite: enrollment in M.B.A. program or consent of department; 440 or equivalent.

544-3 Advanced Production Planning and Inventory Management. An in-depth study of analytical models and techniques for production planning, scheduling, and inventory management. Management science techniques utilized include classical optimization, mathematical programming, and simulation. Prerequisite: enrollment in M.B.A. program or consent of department; 520 or equivalent.

545-3 to 21 Seminar in Strategic Management. (a)-3 Advances in Strategic Manangement. **(b)-3** Strategic Management Systems. **(c)-3** Strategic Management of Information Systems. **(d)-3** International Strategic Management. **(e)-3** Strategic Management of Technology. **(f)-3 to 6** Seminar in Strategic Management. Prerequisite: enrollment in D.B.A. program or consent of department.

546-3 Leadership and Managerial Behavior. This course will concentrate on leader and manager behavior at middle and upper organizational levels. Emphasis will be placed on leader and manager effectiveness and the factors that impact effectiveness. Prerequisite: enrollment in M.B.A. program or consent of department; 540 or equivalent.

547-3 to 15 Seminar in Management Science/ Operations Research. Series of advanced seminars on Management Science/Operations Research (MS/OR). Sections **(a)** through **(c)** may be taken only once each. Section **(d)** may be repeated as topics vary. **(a)-3** Management Science/Operations Research II. **(b)-3** Modern Topics and Research Methods in Management Science/Operations Research. **(c)-3** Production/Operations Management and Information Systems. **(d)-3 to 6** Seminar in Production/Operations Management. Prerequisite: enrollment in D.B.A. program or consent of department.

548-3 to 15 Seminar in Management Information Systems. A series of advanced seminars on Management Information Systems (MIS). Sections **(a)** through **(c)** may be taken only once each. Section **(d)** may be repeated as topics vary. **(a)-3** Advances in Management Information Systems. **(b)-3** Decision Support and Information Systems. **(c)-3** Quantitative and Computer Methods for Decision Support and Information Systems. **(d)-3 to 6** Seminar in Management Information Systems. Prerequisite: **(a)** enrollment in MBA program or consent of department; **(b-d)** enrollment in D.B.A. program or consent of department.

549-3 to 15 Seminar in Organizational Behavior. Series of advanced seminars on organizational behavior. Sections **(a)** through **(d)** may be taken only once each. Section **(e)** may be repeated as topics vary. **(a)-3** Advances in Organizational Behavior and Theory. **(b)-3** Behavior in Organizations—Individual Processes. **(c)-3** Behavior in Organizations—Group and Interpersonal Processes. **(d)-3** Organization of Complex Systems. **(e)-3** Selected Topics in Organizational Behavior and

Theory. Prerequisite: enrollment in D.B.A. program or consent of department.

550-3 Marketing Management. A managerial approach to the study of marketing. Emphasis is on the nature and scope of the marketing manager's responsibilities and on marketing decision making. Prerequisite: enrollment in M.B.A. program or consent of department; 450 or equivalent.

551-3 Product Strategy and Management. Designed to treat product management and its relationships with business policies and procedures; the development of multiproduct strategies, means of developing such strategies, and the problems and methods of commercialization. Prerequisite: enrollment in M.B.A. program or consent of department; 550 or equivalent.

552-3 Research Methodology for Marketing. The study of theory, method, and procedure for quantitative and qualitative analysis of primary and secondary marketing data. Emphasis is placed on application of specific research tools to the process of formulating and testing research hypotheses. Prerequisite: enrollment in D.B.A. program or consent of department.

553-3 Multinational Marketing Management. The basic elements of marketing management are identified in the setting of a global business environment. Emphasis is given to variables in the international markets that effect strategic business planning such as cultural, ethical, political, and economic influences. The course focuses on current trends in the marketing practices of organization. Prerequisite: enrollment in the M.B.A. program or consent of department, 550 and MKTG 435 or equivalent.

554-3 Strategic Issues in Marketing and Society. A critical view of the social, political, legal, and economic impact of strategic marketing decision making. Emphasis is on the ethical and moral ramifications of marketing activities in a complex social environment. Prerequisite: enrollment in M.B.A. program or consent of department.

555-3 Seminar in Consumer Behavior. Emphasis on the theories and research relating behavioral science to the discipline of marketing. Development of sophisticated comprehension of the consumption process is undertaken. Prerequisite: enrollment in D.B.A. program or consent of department.

556-3 Seminar in Marketing Strategy. Long run market opportunities are identified and evaluated. Methods of implementation and execution affecting the relationship of strategic marketing planning to the allocation decisions of top management are emphasized. The orientation is toward theoretical development to provide a base for continuing research in the field. Prerequisite: enrollment in D.B.A. program or consent of department.

557-3 Seminar in Marketing Theory. The philosophical bases underlying the development of theory in marketing. The process of development of marketing ideations through research is emphasized. Prerequisite: enrollment in the D.B.A. program or consent of department.

558-3 Promotional Strategy and Management. The study of the elements of the promotional mix including advertising, personal selling, sales promotion, and publicity, and how they apply in the profit and not-for-profit sectors of the market place. Prerequisite: enrollment in the M.B.A. program or consent of department; 550 or equivalent.

559-3 Seminar in Marketing. Study of current issues and problems in marketing and an evaluation of contemporary marketing theory and practice. Prerequisite: enrollment in M.B.A. program or consent of department; 450 or equivalent.

560-3 Management Information Systems. A survey of information system design, analysis, and operations. Topics include systems concepts, systems analysis and design, database management, software and hardware concepts, decision support systems, distributed processing and telecommunications, and information systems planning. Computer application will be emphasized. Prerequisite: enrollment in MBA program or consent of department; 452 and MBA program 'computer ability' foundation requirement met or equivalent.

573-3 Planning Systems and Strategic Decisions. A critical review of theory and research on the structure, content, and process of strategic decisions. The design and implementation of planning systems also is emphasized. Prerequisite: enrollment in M.B.A. or D.B.A. program or consent of department.

574-3 Advanced Research Methods in Business Administration. A capstone research course in business administration that exposes the student to a full range of research experiences. Emphasis is on integrating learning and creative thinking in the execution of the research process. Prerequisite: enrollment in D.B.A. program.

580-3 International Business Operations. Course is designed to provide an overview of the international dimension of a firm's operations. Alternative methods for reaching foreign markets, operational adjustments and specific problems in dealing with foreign environments, are the principal areas of consideration. Prerequisite: enrollment in M.B.A. program or consent of department; all M.B.A. program foundation.

591-1 to 15 (3 per semester per 700 number) Independent Study. Directed independent study in selected areas of business administration. May be repeated as topics vary. Prerequisite: enrollment in M.B.A. program, or D.B.A. program, or consent of department; consent of instructor.

595-1 to 6 Internship—Work Experience. Current practical experience in a business or other work directly related to course work in a College of Business and Administration program and to the student's educational objectives may be used as a basis for granting credit to the college. Credit is given when specific program credit cannot be granted and is usuable for elective credit only. Credit is sought by petition and must be approved by the COBA dean before registration. Graded S/U or DEF only.

598-3 Business Policies. Study of the development and evaluation of business strategies and policies as they relate to the overall performance of the firm within its environment. Knowledge of the functional areas of administration, available business data, and analytical tools will be utilized in solving comprehensive business cases and sim-

ulation games. Prerequisite: enrollment for past semester in M.B.A. program.

599-3 to 6 Thesis. Prerequisite: enrollment in M.B.A. program or consent of department; consent of instructor.

600-1 to 24 (1 to 16 per semester) Dissertation. Minimum of 24 hours to be earned for the Doctor of Business Administration degree. Prerequisite: advancement to candidacy for the D.B.A. program.

601-1 per semester Continuing Enrollment. For those graduate students in business who have not finished their degree programs and who have one or more INCs or DEFs on their records and/or are in the process of completing their degree requirements. The student must have previously enrolled in a minimum of 36 hours of course work that meets MBA program core and elective requirement or have completed a minimum of 24 hours of BA 600 before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S / U* or *DEF* only.

Accountancy

(See course listing under School of Accountancy.)

Finance

There is no graduate program offered through the Department of Finance. Four-hundred-level courses may be taken for graduate credit unless otherwise indicated in the course description.

433-3 Portfolio Theory and Management. Examination of modern concepts relating to management of security portfolios. Topics include security analysis, Markowitz Portfolio Theory, efficient market hypothesis, portfolio performance measurement, risk, and portfolio construction. Prerequisite: passed 331 with a grade of **C** or better, 361 (361 may be taken concurrently), and must be a business (not prebusiness) major or consent of department.

462-3 Working Capital Management. Short-term budgeting and forecasting techniques used in business; alternative approaches to working capital management including consideration of certainty, risk and uncertainty; theory and applications of management of cash, marketable securities, accounts receivables, inventory, banking relationships, and short-term sources of funds. Prerequisite: 361 or concurrent enrollment and must be a business (not prebusiness) major or consent of department.

463-3 Forecasting and Capital Budgeting. Long-term forecasting techniques used in business; alternative approaches to capital structure decisions, cost of capital measurement; and performance measurement for investment decisions including mergers and leasing; explicit consideration of certainty, risk, and uncertainty in investment analysis; theory and applications in private and public sectors. Prerequisite: 361 or concurrent enrollment and must be a business (not prebusiness) major or consent of department.

464-3 International Financial Management. Financial behavior of multinational firms. Emphasis on the modification of conventional financial models to incorporate uniquely foreign variables. Prerequisite: 361 or concurrent enrollment and must be a business (not prebusiness) major or consent of department.

480-3 Problems in Labor Law. Social, economic, and legal evaluations of recent labor problems, court decisions, and legislation. Concern is on long-run legislative impact on manpower planning, dispute settlement, and utilization of employment resources. Prerequisite: must be a business (not prebusiness) major or consent of department.

Management

There is no graduate program offered through the Department of Management. Four-hundred-level courses in this department may be taken for graduate credit unless otherwise indicated in the course description.

431-3 Organizational Design and Structures. The study of modern theories of complex organizations. Particular emphasis is placed on open-systems perspectives of administrative theory and the adaption of the organization to a changing environment. Prerequisite: 341 and junior standing or consent of department and must be a business (not prebusiness) major.

453-3 Advanced Quantitative Models for Systems Analysis. A continuation of 352. Mathematical model building in organizations and solution techniques commonly used to solve such models. An extension of topics in deterministic and probabilistic modeling introduced in 352. Prerequisite: 352, junior standing or consent of department and must be a business (not prebusiness) major.

456-3 Building Decision Systems Support. Investigation of selected systems and computer based methods for aiding management decision-making. Topics include systems analysis applications, simulation, and decision models. Prerequisite: 345, 352, and junior standing or consent of department and must be a business (not prebusiness) major.

471-3 Seminar in Entrepreneurship. Investigation of selected special or advanced topics in seminar format. Topics may include but are not limited to entrepreneurship, small business analysis, or topics related to the ownership and management of a business. Activities will include library and field research, data analysis, report writing, and active participation in seminar presentations and discussions. Designed particularly for the student who has completed the three small business courses numbered 350 and has discussed personal small business or entrepreneural objectives with the instructor prior to registration. Prerequisite: consent of department and must be a business (not prebusiness) major.

474-3 Management's Responsibility in Society. Analysis of the cultural, social, political, economic, and immediate environment of the organization. Particular emphasis is given to the manner in which the manager adapts to and is

influenced by the environment and its conflicting demands. Prerequisite: senior standing or consent of department and must be a business (not prebusiness) major.

483-3 Advanced Production-Operations Management. In-depth study of analytical planning, scheduling, and control theory and techniques in the context of production/operations systems. Case exercises will be utilized to illustrate production management problems and methods. Prerequisite: 318, 352, junior standing or consent of department and must be a business (not prebusiness) major.

485-3 Organizational Change and Development. Analysis of problems in personnel management with emphasis on current trends and techniques. Case problems, special reports, and experiential approaches are used as a basis for examining ways of using an organizations' human resources to best advantage. Prerequisite: 341, junior standing or consent of department and must be a business (not prebusiness) major.

Marketing

There is no graduate program offered through the Department of Marketing. Four-hundred-level courses may be taken for graduate credit unless otherwise indicated in the course description.

401-3 Retail Management. Designed to present the basic principles in decision areas such as location, layout, organization, personnel, merchandise control, sales promotion, advertising, etc. Retail merchandising through managerial perspective. Prerequisite: 304 and junior standing or higher and must be a business (not prebusiness) major or consent of department.

435-3 International Marketing. Analysis of international operations. Emphasis on the factors influencing marketing to and within foreign countries and the alternative methods of operations open to international firms. Prerequisite: 304 and junior standing or higher and must be a business (not prebusiness) major or consent of department.

438-3 Sales Management. Analysis of the management of the sales effort within the marketing system. Philosophies, concepts, and judgment criteria of the sales function in relationship to the total marketing program. Prerequisite: 304 and Management 304 or 301 and junior standing or higher and must be a business (not prebusiness) major or consent of department.

439-3 Industrial Marketing. Analysis of decision criteria related to the marketing of industrial products. Emphasis on program development, formulation of a marketing mix, and the behavioral relationships in the modern industrial organization. Prerequisite: 304 and junior standing or higher and must be a business (not prebusiness) major or consent of department.

452-3 Physical Distribution Management. Integration of physical distribution activities of the firm into a system. Transportation and location as elements of the system. Inventories and service as constraints upon the system. Planning, operation, organization, and management of the system. Prerequisite: 304 and junior standing or higher, or consent of the department and must be a business (not prebusiness) major or consent of department.

463-3 Advertising Management. Advertising from the viewpoint of business management. Develops an understanding of the role of advertising under various conditions. Problems of integrating advertising strategy into the firm's total marketing program. Prerequisite: 304 and 363 and junior standing or higher and must be a business (not prebusiness) major or consent of department.

493-3 Marketing Policies. A comprehensive and integrative view of marketing policy formulation. Marketing decisions analyzed and discussed. Prerequisite: 329, 363, and 390 (not more than one to be taken concurrently) and junior standing or higher and must be a business (not prebusiness) major or consent of department.

Chemistry and Biochemistry

All laboratory courses in chemistry and biochemistry require the student to purchase either special notebooks or workbooks, costing within the range of $1.50 to $8.50. All students enrolled in a chemistry class that includes a laboratory session will be assessed a breakage charge for all glassware broken. This policy will apply to undergraduate and graduate students.

411-3 Intermediate Inorganic Chemistry. Fundamentals of inorganic chemistry, covering bonding and structure, coordination compounds, and the chemistry of some familiar and less familiar elements. Three lectures per week. Prerequisite: 465a or concurrent enrollment.

416-3 X-Ray Crystallography. (See Geology 416.) Prerequisite: 222b, one year of college physics and Mathematics 150.

431-4 Environmental Analytical Chemistry. Practical applications of common instrumental and wet methods to the determination of chemical substances in common natural and commercial materials. Techniques will include titrimetry; quantitative transfer of liquids and solids; gas, thin-layer and ion-exchange chromatography; atomic absorption; flame photometry; ion selective electrode potentiometry; and spectrophotometry. The course is intended for senior-level and graduate students in disciplines other than chemistry who desire to know the practical aspects of laboratory measurements. The course is not applicable to a major in chemistry. One lecture, one laboratory-lecture, and two three-hour laboratories per week. Prerequisite: 222a,b or nine hours of chemistry excluding general education courses.

434-2 or 4 Instrumental Analytical Chemistry. Theory and practice of modern instrumental measurements, including emission and absorption spectroscopic, electroanalytical, and chromatographic methods, and an introduction to applied electronics. Two lectures and two three-hour laboratories per week for four credits. Enrollment for two credit hours is restricted to grad-

uate students in the Department of Chemistry and Biochemistry advised to take instrumental analysis. Prerequisite: one semester of physical chemistry or concurrent enrollment in 465a.

436-3 Analytical Separations and Analyses. A study of the analyses of complex materials, usually inorganic, with emphasis on separations, functional-group chemical analyses, and instrumental applications. Two lectures and one three-hour laboratory per week. Prerequisite: 226 and one semester of physical chemistry which may be taken concurrently.

444-3 Intermediate Organic Chemistry. Intended for incoming graduate students and advanced preprofessional students. Provides students with intermediate level coverage of organic reactions, mechanisms, syntheses, and structure of determination. Emphasis will be placed on problem solving, including structure elucidation, road map sequences, multistep synthetic sequences, and elucidation of reaction mechanisms including those with stereochemistry and multiple sites of reactivity. Prerequisite: 344, 346, or equivalent and consent of instructor.

446-4 Qualitative Organic Analysis. A systematic study of the separation and identification of organic compounds. Two lecture and six hours of laboratory per week. Prerequisite: 226 and either 346 and 349 or consent of instructor.

451-6 (3, 3) Biochemistry. (a) Chemistry and function of amino acids, proteins, and enzymes; enzyme kinetics; chemistry, function, and metabolism of carbohydrates; citric acid cycle; electron transport and oxidative phosphorylation. **(b)** Chemistry, function, and metabolism of lipids; nitrogen metabolism; nucleic acid and protein biosynthesis; metabolic regulation. Three lectures per week. Must be taken in a,b sequence. Prerequisite: one year of organic chemistry.

455-4 Biochemistry Laboratory. Modern biochemical laboratory techniques for isolation, purification, and characterization of constituents of living cells and for investigations of pathways, kinetics, energetics, and regulatory mechanisms related to metabolism and enzymic activity. One lecture and eight hours of laboratory per week. Prerequisite: 451a and 226 or concurrent enrollment; graduate standing in the Department of Chemistry and Biochemistry or consent of the instructor.

456-3 Biophysical Chemistry. A one semester course in biophysical chemistry intended for biochemists and molecular biologists. Emphasis will be on solution thermodynamics, kinetics, and spectroscopy applied to biological systems. Prerequisite: MATH 141 or 150, CHEM 380a and b or 344 and 346, CHEM 451a or concurrent enrollment.

465-9 (3,3,3) Physical Chemistry. A three semester sequence of physical chemistry. Three lectures per week. **(a)** Classical thermodynamics, its applications, and reaction kinetics. **(b)** Quantum chemistry and group theory. **(c)** Spectroscopy and statistical mechanics. To be taken in a,b,c sequence. Prerequisite: **(a)** Mathematics 250; **(b)** Mathematics 305 or 221 **(c)** 465b.

466-2 (1,1) Physical Chemistry Laboratory. A two semester laboratory sequence for 465. One three hour laboratory per week per semester. **(a)** Experiments relating to topics covered in 465a. Prerequisite: 226b and 465a. **(b)** Experiments relating to topics covered in 465b,c. Prerequisite: 465b.

489-1 to 3 Special Topics in Chemistry. Prerequisite: consent of instructor and of chairperson.

490-2 Chemical Literature. A description of the various sources of chemical information and the techniques for carrying out literature searches. Two lectures per week. Prerequisite: 346 and 347 or 349.

491-2 History of Chemistry. The evolution of chemistry from ancient times until 1920. Two lectures per week.

502-3 Molecular Orbital Theory. An introduction to molecular orbital theory. Applications and limitations of various methods. Three lectures per week. Prerequisite: one year of undergraduate physical chemistry including quantum mechanics.

511-6 (3,3) Advanced Inorganic Chemistry. (a) Principles of group theory and their application to molecular structure, ligand field theory and its application and magnetic properties of matter. **(b)** Energetics, kinetics, and mechanisms of inorganic systems. Prerequisite: one year of physical chemistry, 411 or satisfactory completion of 500.

519-1 to 9 (1 to 3 per semester) Advanced Topics in Inorganic Chemistry. Metal ions in biological processes and other selected topics to be announced by the department. Maximum credit nine semester hours. Prerequisite: consent of instructor.

531-3 Theory of Chemical Analysis. The phenomena utilized in analytical chemistry with emphasis on separations, organic reagents, and complex methods. Three lectures per week. Prerequisite: 436 or equivalent.

532-3 Analytical Chemistry Instrumentation. Theories of design and methods of interfacing components of instruments with applications to optimization of systems for determinations of chemicals in trace concentrations. Two lectures and one three-hour laboratory per week. Prerequisite: 434.

535-3 Advanced Analytical Chemistry. Theory and applications of chromatography; statistics; uses of laboratory computers in chemical instrumentation and data evaluation. Three lectures per week. Lectures will occasionally be used for laboratory operations. Prerequisite: 434.

539-1 to 9 (1 to 3 per semester) Advanced Topics in Analytical Chemistry. Selected topics of interest to practicing analytical chemists such as microanalytical chemistry, functional-group chemical determinations, absorption spectroscopy, and electroanalytical chemistry. Maximum credit nine semester hours. Prerequisite: 434.

541-3 Organic Structure and Reactivity. Structure and reactivity of organic compounds: steric, electronic, kinetic, and thermodynamic aspects. NMR, ESR, IR, and mass spectrometry in structure characterization. Prerequisite: master's degree in chemistry, or a grade of *B* or better in 446, or passing grade on the organic diagnostic examination.

542-3 Mechanistic Organic Chemistry. Reaction mechanisms in organic chemistry. Orbital symmetry, photochemistry, and the chemistry of

the common transient intermediates. Prerequisite: master's degree in chemistry, or a grade of *B* or better in 446, or passing grade on the organic chemistry diagnostic examination.

543-3 Synthetic Organic Chemistry. Organic synthesis: classical and modern methods. Prerequisite: master's degree in chemistry, or a grade of *B* or better in 446, or passing grade on the organic chemistry diagnostic examination.

549-1 to 9 (1 to 3 per semester) Advanced Topics in Organic Chemistry. Specialized topics in organic chemistry. The topic to be covered is announced by the department. Maximum credit nine semester hours. Prerequisite: 542.

556-1 to 7 Advanced Biochemistry. A critical treatment of the topics indicated below. A student may select any one, two, three, or all four topics for the indicated credit. **(a)**-2 Eurkayotic molecular biology. Prerequisite: 451a,b or equivalent; MICRO 460 recommended. **(b)**-1 Chemical data analysis. Data reduction and analysis with a laboratory microcomputer with examples from chemistry and biochemistry. Prerequisite: 451a,b or equivalent; MICRO 460 recommended. **(c)**-2 Chemistry and biochemistry of biological membranes. An advanced level introduction to the techniques used to study biological membranes including: electron microscopy, X-ray diffraction, spectroscopy, electrophysiological, and biochemical. Topics will include the latest information from biophysics to molecular biology. Prerequisite: 556a,b. **(d)**-2 Biophysical methods. Prerequisite: 556a,b,c.

559-1 to 12 (1 to 3 per semester) Selected Topics in Biochemistry. Topic to be announced by the department. Maximum credit twelve semester hours. Prerequisite: 451b.

560-3 Introduction to Quantum Chemistry. Basic principles and applications of quantum mechanics to chemistry. Topics include operator and vector algebra, classical mechanics, angular momentum, approximate methods, hydrogen-like atoms, and molecular electronic structure. Three lectures per week. Prerequisite: one year of undergraduate physical chemistry.

562-6 (3,3) Advanced Molecular Spectroscopy. (a) Theory of rotational and vibrational spectroscopy, electronic spectroscopy of molecules. **(b)** Magnetic resonance, general theory, spectral analysis, chemical shifts and coupling constants, exchange phenomena, Fourier Transform methods, 13C nuclear magnetic resonance, electron paramagnetic resonance, and hyperfine interactions. Three lectures per week. Prerequisite: 565 or consent of instructor.

564-3 Statistical Thermodynamics. Principles of statistical mechanics and applications to equilibrium and nonequilibrium systems. Topics include ideal gases, monatomic crystals, lattice statistics, the cluster method, correlation functions, Brownian motion, the Boltzmann equation, and the Kubo-Green technique. Three lectures/week. Prerequisite: 465a,b or consent of instructor.

565-3 Group Theory. Applications of group theory to quantum mechanics and spectroscopy. Three lectures per week. Prerequisite: 465a,b or consent of instructor.

569-1 to 9 (1 to 3 per semester) Advanced Topics in Physical Chemistry. Topic to be announced by the department. Maximum credit nine semester hours. Prerequisite: consent of instructor.

594-2 to 3 Special Readings in Chemistry. Assigned library work in any of the six fields of chemistry with individual instruction by a staff member. **(a)** Analytical, **(b)** biochemistry, **(c)** inorganic, **(d)** organic, **(e)** physical, **(f)** history of chemistry. Maximum credit three hours.

595-1 Advanced Seminar in Chemistry. Advanced level talks presented by graduate students. **(a)** Analytical, **(b)** biochemistry, **(c)** inorganic, **(d)** organic, and **(e)** physical chemistry.

597-1 to 15 Professional Training. Experience in teaching of chemistry, instrument operation and special research projects. One hour required each semester in residence. Graded *S/U* only. Prerequisite: graduate standing.

598-1 to 50 (1 to 12 per semester) Research. Maximum credit 50 hours, except by permission of the student's graduate advisory committee. Graded *S/U* only. Prerequisite: consent of chair.

599-1 to 6 Thesis. Maximum credit six hours. Prerequisite: consent of chair.

600-1 to 30 (1 to 12 per semester) Dissertation—Doctoral. Requirement for Ph.D. degree, 24 hours. Maximum credit 30 hours, except by permission of the student's graduate advisory committee. Prerequisite: 598.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Cinema and Photography

Graduate work in the Department of Cinema and Photography is offered toward the Master of Fine Arts degree and the Master of Arts degree in public visual communications. Four hundred-level courses in this department may be taken for graduate credit unless otherwise indicated in the course description.

Students provide photographic materials for all cinema and photography production courses, students supply their own film, photographic paper, certain specialized chemicals, a fully adjustable 35mm or 120 roll film camera, and $15 additional cost for laboratory materials for each production course. In motion picture production courses, students provide their own film, processing, recording materials, and editing supplies. In courses which involve analysis and screening of a number of films, a cost of $10 per course for screenings will be required.

401-3 Large Format Photography. Introduction to the aesthetics and techniques of large format (sheet film cameras) photography with emphasis on personal expression and commercial/professional applications. Students purchase texts and provide photographic materials and chemicals. $15 for additional laboratory materials. Prerequisite: 322 or concurrent enrollment and consent of department.

402-3 Sensitometry. An advanced course dealing with the technical and visual applications of the black and white process. Explores the zone system, density parameter system, and practical chemistry. Also deals with the visual application of these systems. Laboratory fee: $15. Prerequisite: 320 and consent of department.

404-3 Introduction to the Studio. Problems and possibilities in the aesthetics and techniques of studio photography: lighting, visual perception, environment, history, theory. Students purchase texts and provide photographic materials. $15 laboratory fee. Prerequisite: 320 or consent of department.

405-3 Applied Photography I. Theory and practice of contemporary commercial/industrial photography. Students provide materials and may purchase texts. Laboratory fee: $15. Prerequisite: 322 and consent of department.

406-3 Applied Photography II. Practice and ideas of advertising/illustrative and editorial photography. Students purchase materials and may purhase props, texts, and equipment. Laboratory fee: $15. Prerequisite: 405 and consent of department.

407-3 Photography and the Mass Media. Exploration of the use, context, and meaning of photography in the mass media. The photograph as a communications tool will be evaluated along with the role and responsibility of the photojournalist. Students will apply theoretical concepts through group and individual assignments. Students purchase texts and provide photographic materials. $15 laboratory fee. Prerequisite: 320 and consent of department.

408-3 Documentary Photography: Method, Format, and Distribution. Exploration of the techniques, history, and contemporary context of documentary photography. Audience, publication, and distribution of documentary projects will be addressed. Each student will produce an in-depth documentary photographic project. Students purchase texts and provide photographic materials. $15 laboratory fee. Prerequisite: 322 and consent of department.

420-3 Experimental Camera Techniques. Experimental approaches to the creation of photographic images in the camera. Students provide materials and may be required to purchase texts. Laboratory fee: $15. Prerequisite: 322 and consent ofdepartment.

421-3 Experimental Darkroom Techniques. Experimental darkroom manipulations of the straight camera image. Students provide materials and may purchase texts. Laboratory fee: $15. Prerequisite: 322 or consent of department.

422-3 Advanced Color Photography. Advanced study and production of color photographs with emphasis on experimental techniques using Dye Transfer, Kwik Proof, and other forms of photo-mechanical reproduction. Students provide materials and may purchase texts. Laboratory fee: $15. Prerequisite: 322 and consent of department.

423-3 Reconstruction of Color. A study of the principle of color separation in photography as it relates to the processes of dye transfer, silkscreening, lithography, letter press, etching, and other reproduction processes. Students purchase texts and provide photographic materials and chemicals. $15 cost for additional laboratory materials. Prerequisite: 322.

425-3 to 9 Studio Workshop. An intensive workshop focusing on current trends in photography. Topics have included landscape photography, architectural photography, environmental portraiture, and imagemaking, among others. Students provide photographic materials and may purchase texts. Laboratory fee: $15. Prerequisite: 322 or consent of department.

426-3 Non-Silver Photography. Intensive introduction to hand-applied emulsions of cyanotype, vandyke brownprinting, gum printing, etc. Students purchase materials and may purchase texts. Laboratory fee: $15. Prerequisite: 322 and consent of department.

449-3 Survey of Film History. Intensive study of major historical periods of the cinema, including technological developments, national cinema movements, sociological and aesthetic determinations, and concerns of film historiography. Prior completion of 349 and 360 is strongly recommended for cinema and photography majors. Screening fee: $10.

452-3 Film Planning and Scripting. The screenplay as a basis for production. Practice in preparing film plans, treatments, storyboards, and scripts. Examination of the film industry. Prerequisite: 355 or consent of department.

454-3 Animated Film Production. Practical course for visual expression exploring various animation techniques: developmental, filmographic, rear lit, cut out, line, cel, etc. Students purchase texts, art supplies, film materials, and processing. Equipment usage fee: $10. Prerequisite: 355 and/or consent of department.

455-3 Film Production III. Advanced production by individuals or crews of 16mm sound films from pre-production through shooting. Intensive study of budgeting, production planning, scripting, casting, location and studio shooting techniques, equipment rental, lighting, and double system sound filming. Students provide film stock, processing and sound materials. Equipment usage fee: $50. Prerequisite: 356, 452 or consent of department.

456-3 Film-Production IV. Continuation of 455 through post production to a first answer print. Intensive study of editing, sound mixing, laboratory procedures and distribution. Students provide editing and sound materials and are responsible for laboratory costs. Equipment usage fee: $50. Prerequisite: 455 and consent of department.

462-3 History of the Documentary Film. Study of the development of the non-fiction film with emphasis on the documentary. Screening fee: $10. Students purchase texts.

463-3 History of the Experimental Film. Study of experimentation in cinema from the turn of the century to contemporary avant-garde films. Student purchase texts. Screening fee: $10.

465-3 History of the Animated Film. Study of the history, techniques, and aesthetics of the graphic/animated film. Students purchase texts. Screening fee: $10.

466-3 to 6 (3, 3) Film Styles and Genres. Intensive study of specific body of films grouped by similarities in style, genre, period and cultural origin. Emphasis of historical, theoretical, and critical issues. Topics vary each semester. Sample topics: the Western; the French new wave: Third World cinema: Surrealism in film. Screening fee: $10.

467-3 to 6 (3, 3) Film Authors. Intensive study of the work of one or more film authors (directors, screenwriters, etc.). Emphasis is on historical, theoretical, and critical issues. Topics vary each semester. Sample topics: the films of Alfred Hitchcock, the films of Jean Renoir. Screening fee: $10.

468-3 Advanced Film Theory and Analysis. An intensive study of contemporary film theory with an emphasis on the application of analytic models. Focus is on structural, semiotic, and psychoanalytical theory of the cinema, and the textual analysis of specific films. Screening fee: $10. Prerequisite: 368 or graduate standing.

470-3 to 9 (3, 3, 3) Advanced Topics. An advanced course concentrating on special topics in cinema and photography. **(a)** Advanced studies in cinema history/theory. Topics offered have been the information film, feminist and ideological criticism of film. **(b)** Advanced topics in film production. Topics offered included motion picture sound workshop, narrative film workshop. **(c)** Advanced studies in photography. Topics offered have included publication and presentation, the figure, multi-image, fantasy photography among others. **(d)** Advanced studies in interdisciplinary topics. Not more than six semester hours may be counted for graduate credit. Screening fee for a): $10. Laboratory fee for c): $15. Equipment usage fee: $10 to $50 to be determined. Prerequisite: consent of department.

471-3 to 6 (3, 3) Problems in Creative Production: Photography. Conceptual exercises involving different aspects of photographic production. Emphasis is placed upon individual creative response to assignments. Topics vary; may be repeated for a total of 6 credits. Students provide photographic materials and chemicals and may purchase texts. Equipment usage fee: $10 to $50 to be determined by project. Prerequisite: 322 and consent of department.

472-3 to 6 (3, 3) Problems in Creative Production: Cinema. An intensive examination, through readings, screenings, and filmmaking, of a cinematic genre, style, movement, or technical challenge. Theory is combined with practice, resulting in a group film production. Previous problems studied have been the pseudo-documentary, 35mm filmmaking, and film as performance. Topics may vary; may be repeated for a total of 6 credits. Prerequisite: consent of department.

541A-3 Seminar: History of Photography, 1839 to World War II. Advanced study of the history of photography with emphasis on the development of technique and content. Students purchase texts.

541B-3 Seminar: Contemporary History of Photography. Advanced study of the history of photography with emphasis on the development of technique and content. Students purchase texts.

542A-3 Seminar in Film History: American. Analysis of the films and ideas associated with a particular director or a significant movement in motion picture history. Screening fee. Students purchase texts. Course content varies each semester; may be repeated for a total of 6 credits.

542B-3 Seminar in Film History: International. Analysis of the films and ideas associated with a particular director or a significant movement in motion picture history. Screening fee. Students purchase texts. Course content varies each semester; may be repeated for a total of 6 credits.

574-3 Contemporary Theory and Analysis of Cinema. An intensive examination of the dominant recent theoretical approaches to the cinema. The application of cinema of semiology and structuralism, with very recent branches into psychoanalysis and ideology, will be concentrated upon. Films related to the issues under study are assigned for viewing. Students purchase texts.

575-6 (3,3) Contemporary Theory and Analysis of Photography. Selected readings in the aesthetics and philosophy of photography. Students purchase texts. Weekly reading assignments, discussions, midterm exam, and final paper. Topics vary; may be repeated for a total of 6 credits. Prerequisite: consent of instructor.

591-1 to 6 Individual Study in Cinema and Photography. Supervised research or independent creative work, the area of study to be determined by the student in consultation with cinema and photography faculty. Prerequisite: consent of department.

595-1 to 4 (1,1,1,1) Graduate Seminar. A seminar for graduate degree candidates focusing on the artistic development of the participants. **(a)** Graduate seminar in photography. **(b)** Graduate seminar in film production. Prerequisite: admission to the M.F.A. program in still photography or the M.A. program in public visual communications.

597-1 to 16 M.F.A. Projects. Supervised independent creative work, the amount and exact nature of which is to be determined in consultation with the cinema and photography faculty. Equipment usage fee: $50. Prerequisite: admission to the M.F.A. program and consent of department.

598-1 to 6 M.F.A. Final Creative Project. Supervised independent creative work leading to the completion of the M.F.A. creative project requirement. Registration for six hours of 598 is required of each M.F.A. candidate. Equipment usage fee: $50. Prerequisite: admission to the M.F.A. program and consent of the department.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Civil Engineering and Mechanics

(See Engineering.)

Communication Disorders and Sciences

406-3 Methods and Materials. Current information regarding treatment procedures in communication disorders will be presented. Additionally, topics will include clinical practice in various settings, federal legislation, scheduling, case selection and counseling, and the impact on service delivery.

408-3 Communicative Disorders: Craniofacial Anomalies. An introduction to the ontology, teratology, and management of cleft palate and various craniofacial syndromes important to majors and non-majors interested in this aspect of communication and its disorders. Associated problems of personal and social adjustments are also examined. Prerequisite: 214 or consent of instructor.

410-3 Multicultural Aspects of Communication Disorders. Students will explore different cultures and communication within these cultures. Emphasis will be placed on the relationship between cultural differences and communication disorders. Review of speech and language disorders in multicultural populations, as well as assessment and intervention strategies for use with this diverse group will be provided. Prerequisite: 302, 303, 417 or consent of instructor.

417-3 Stuttering. Reviews the data and theories that relate to the etiology, onset and development of stuttering.

418-3 Paraments of Voice. Physio-acoustic parameters of voice quality variables evidenced in verbal communication. Lectures and demonstrations emphasize basic information necessary to study for the treatment of voice disorders.

419-3 Communication Problems of the Hearing Impaired. Objectives and techniques for the teaching of lip reading, speech conservation, and auditory training. Prerequisite: 302, 303, and 420, or equivalents and consent of instructor.

420-3 Introduction to Audiological Disorders and Evaluation. Bases of professional field of audiology (orientation, anatomy, and physiology of the auditory system), major disease processes influencing hearing and their manifestations, measurement of hearing loss. Prerequisite: 203 and 204.

428-3 Communication Disorders and the Classroom Teacher. Etiology and therapy of common speech defects. May be taken by all in-service teachers, seniors, and graduate students in education.

431-1 to 6 Speech Physiology. Course focuses on the physiologic parameters of the supraglottal tract, and respiratory and laryngeal systems related to speech production. Discussion and laboratory experiences involve physiological characteristics of normal and disordered speech production, measurement and research procedures, and implications for neuromotor control of speech. Prerequisite: 203 and 214 or consent of instructor.

438-2 Problems of Communication and the Process of Aging. Reviews problems of communication related to the aging process and examines relevant diagnostic and therapeutic techniques. Prerequisite: senior or graduate standing.

450-3 Neuroanatomical Basis of Human Communication. Examination of the central nervous system (brain and spinal cord) as it relates to normal and disordered human communication. Presentation of basic neuroanatomy, common neuropathologies relevant to communication disorders, and strategies in neurogenic problem solving. Prerequisite: 214, 307, or consent of instructor.

460-3 Augmentative and Alternative Communication Systems. An introduction to alternative and augmentative communication systems for non-vocal clients. Discussions include: use of aided and unaided augmentative systems, assessment procedures and training. Prerequisite: 203, 214, 307 or consent of instructor.

485-1 to 9 (1 to 3 per section) Special Topics in Communication Disorders and Sciences. Topical presentations of current information on special interests of the faculty not otherwise covered in the curriculum. Designed to promote better understanding of recent developments related to disorders of verbal communication. Open to advanced undergraduate and graduate students with consent of instructor. The student may take only one section per 700 number.

491-1 to 9 (1 to 3 per semester) Individual Study. Activities involved shall be investigative, creative, or clinical in character. Must be arranged in advance with the instructor, with consent of the chairperson. Prerequisite: consent of chairperson.

492-3 Diagnostic Procedures in Communication Disorders. A course devoted to discussion of the role of the speech and hearing clinician as a differential diagnostician. Special emphasis is placed on correlating information obtained from the oral-peripheral examination, articulation and language evaluation, audiometric and case history information in constructing the initial evaluation report. Prerequisite: 302, 303, and one additional 300-level course or consent of instructor.

493-3 Basic Clinical Practice. Supervised clinical practicum in base theory procedures, diagnostic techniques, and preparation of reports. Prerequisite: 302, 303 and two additional 300-level courses or equivalents or consent of instructor. For CDS majors only.

494-3 Advanced Clinical Practice-Therapy/SLP. Advanced clinical practicum in communication disorders. Emphasis will be placed on specialized therapy procedures, diagnostic techniques and the preparation of reports. For CDS majors only. Prerequisite: 302, 303, 493, or equivalents and consent of instructor.

495-3 Advanced Clinical Practice-Diagnostics/SLP. Advanced clinical practicum in speech and language diagnostic. Populations of children and adults will be evaluated. Emphasis will be

placed on diagnostic techniques used in evaluation, as well as preparation of evaluation reports. For CDS majors only. Prerequisite: 492, 493 or equivalent.

497-1 to 2 Advanced Clinical Practice: Hearing Diagnostics. Advanced clinical practice in hearing diagnostics. Emphasis will be placed on diagnostic techniques used in the preparation of basic and advanced audiological reports. Prerequisite: consent of instructor.

500-3 Research Design in Speech Pathology and Audiology. Evaluation of the strategies and procedural tactics of behavioral research.

503-3 Laboratory Instrumentation in Speech-Language and Hearing Science. Physiological, acoustical, and biomedical recording, measurement and analysis of the speech encoder, decoder, and code for clinical and research applications. Prerequisite: 203 or consent of instructor.

505-3 Phonological Acquisition. An introductory discussion of the important linguistic, physiological, and acoustic variables which affect language production at the segmental and suprasegmental level of language; and an historical examination of the growth and development of distinctive feature systems from 1920 to the present. Concentration upon the mathematical, logical, physiological, and acoustic assumptions of the various matrices which have been developed. Prerequisite: 302 or equivalent and consent of instructor.

507-3 Language Acquisition. Discussion of the application of current theoretical implications and research findings to the syntactically impaired. This course emphasizes diagnostic and therapeutic models applicable to language disorders. Opportunities for research and clinical experience with young children displaying developmental language problems will be provided. Required for master's students. Prerequisite: 303 or equivalent and consent of instructor.

510-3 Stuttering: Behavior Assessment and Therapy. Explores the assumptions underlying diagnosis and assessment. Procedures specific to the differential assessment of fluency failures are examined, evaluated, and related to therapeutic strategies and the tactics of behavior change. Prerequisite: 319 or equivalent, and consent of instructor.

512-3 Voice Disorders. An intensive study of the variables of air stream modulation resulting from impaired structures and function of head and neck. Prerequisite: 318 or equivalent and consent of instructor.

517-3 Seminar: Language Disorders in Children. Students will explore current theories of syntactical and semantic acquisition with an emphasis upon applicability to clinical research and methodology. An historical review of linguistic theory will form the basis for discussion of research approaches in psycholinguistics. Students will review psycholinguistic research and devise paradigms appropriate for the study of verbal impairment. Elective course for master's and doctoral candidates. Prerequisite: 303 or equivalent and consent of instructor.

521-3 Audiology II: Peripheral and Central Auditory Tests. Application of special behavioral auditory techniques used for site-of-lesion testing, basic anatomical and neurological correlates of abnormal auditory behavior. Prerequisites: 420 or equivalent and consent of instructor.

525-3 Amplification for the Hearing Impaired. Clinical and laboratory methods of evaluating hearing aid performance; counseling of adult clients, parents and teachers; professional relationship of audiologist to otologists and to hearing aid dealers; use and evaluation of individual and classroom auditory trainers. Prerequisites: 420 and consent of instructor.

526-3 Audiology III: Objective Procedures and Hearing Conservation. Theory and practice in the use of objective auditory procedures such as acoustic immittance measures, auditory brainstem response, and event related potentials; also a consideration of techniques used in hearing conservation such as environmental noise controls and identification audiometry. Prerequisites: 420, and consent of instructor.

528-3 Seminar: Physio- and Psycho-Acoustics of the Ear. Advanced study of the physiological responses of the middle and inner ear to the acoustic stimulus, in relation to major theories of auditory function; advanced study of behavioral responses to the major parameters of the acoustic stimulus; threshold sensitivity, loudness, pitch, localization, beats, and masking. Prerequisite: 316 or equivalent and consent of instructor.

530-3 Aural Rehabilitation/Auditory Perceptual Disorders. Advanced study of aural (re) habilitative principles and practices for children and adults as well as diagnoses and remediation of auditory perceptual disorders. Prerequisites: 420, 521, 525, and consent of instructor.

533-3 to 6 (3,3) Seminar: Speech and Auditory Perception. Special problems in hearing and communication science. Students may choose from a wide range of topics: speech acoustic, kinesthetic and vibrotactile perception, voiceprint identification, synthetic and compressed speech, digital speech, electrostimulation of hearing, and neurophysiological basis for perception. One or more topics are pursued in depth. The seminar may be repeated for a total of six hours with different content. Prerequisite: consent of instructor.

536-3 Seminar: Administration of Speech and Hearing Programs. Program settings, organizational procedures, and professional interrelationships in adult speech and hearing therapy. Field trips to rehabilitation centers and related agencies.

540-3 Neurogenic Disorders of Communication I. Focus on aphasia and neurolinguistic science. A clinically oriented presentation of the aphasias, and related CNS language disturbances, will be integrated with an introduction to the broader field of neurolinguistics. Clinical aspects will focus on assessment of rehabilitation approaches in aphasia and related disorders. Other topics include cortical language representation, hemispheric functions (general), and review of basic neurolinguistic literature. Prerequisite: 450 or consent of instructor.

541-3 Neurogenic Disorders of Communication II. Focus on the role of the pyramidal and extrapyramidal motor systems in speech production and speech disorders related to abnormalities in these motor systems. Discussion of the neurological basis and clinical management of the

dysarthrias and verbal apraxia. Prerequisite: 540 or consent of instructor.

544-3 Seminar: Phonological Disorders in Children. An historical examination of the growth and development of distinctive feature systems from 1920 to the present. Concentrates on the mathematical, logical, physiological, and acoustic assumptions of the various matrices which have been developed. Prerequisite: 302 or equivalent and consent of instructor.

548-3 Seminar: Stuttering Behavior-Theory and Research. Examines modern learning theory approaches to fluency failure. The learning models dealt with are critically examined in relation to clinical and experimental data. Also reviews the research data on stuttering in relation to design, methodology, and technology. Discussions serve as the background for original investigations. Prerequisite: 319 or equivalent and consent of instructor.

550-1 to 15 Professional Training Seminar. A special seminar that provides doctoral students the opportunity to prepare and present papers on various aspects of speech-language pathology and audiology. Liberal discussion will follow each paper. All doctoral students are required to enroll for one credit each semester until admitted to candidacy. Graded *S/U* only. Only four credit hours are counted toward the Ph.D. degree.

590-1 to 4 (1 to 2, 1 to 2) Readings in Speech-Language Pathology and Audiology. Supervised and directed readings in specific areas of speech pathology and in audiology. Maximum of two hours counted toward master's degree. Prerequisite: consent of chair.

593-1 to 3 Research Problems in Speech-Language Pathology and Audiology. Individual work upon selected problems for research. Prerequisite: consent of chair.

597-9 Public School Practicum. Public School internship provides the student with clinical experience under the supervision of a school-based certified speech-language pathologist. The student should receive experience with the disorders of fluency, articulation, voice, organics, language, and hearing. The student should also gain administrative experience. Prerequisite: 150 to 200 clock hours and consent of instructor.

598-1 to 3 Internship in Speech-Language Pathology and Audiology. Internship in a selected medical center, hospital clinic, community agency, or private clinic. The internship provides the student with an intensive, professional, clinical experience under supervision of qualified and certified resident staff members. Prerequisite: consent of chair.

599-1 to 6 Thesis.

600-1 to 32 (1 to 16 per semester) Dissertation.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Communications and Fine Arts

497-1 to 6 Special Interdisciplinary Study. Designed to offer and test new and experimental courses and series of courses within the College of Communications and Fine Arts. Prerequisite: consent of instructor.

Community Development

401-3 Introduction to Community Development. This course surveys the field of community development, an applied social science that encourages self-reliance by generating change and growth strategies for groups and communities. The course focuses on the history and philosophy of community development, citizen rights issues, change techniques, value dilemmas confronting change agents, and examination of some current community development programs.

402-3 Third World Community Development. Analyses of the history, goals, methods, and techniques of socioeconomic development in the Third World countries. Cultural, economic, social structural, political, and administrative factors in development and in the process of community organization are discussed. Case studies from Africa, Asia, and Latin America.

403-3 Community Organization. An examination of basic approaches to community organization used by change agents and human service workers. Special emphasis is placed on sensitizing students to consumer participation issues.

404-3 Role Theory and Analysis in Community Development. The focus of this course is on role theory and methods of analysis. The student will gain considerable exposure to the techniques of role analysis as an evaluation tool in community development training and program development.

405-3 Social Planning. Introduction to the methods, practices, functions, and ethics of social planning in the United States, including a critical perspective. Criminal justice, health, manpower, welfare, and other sectors of social planning will be discussed to illustrate the principles of social planning.

489-3 Field Service Seminar. (Same as Social Work 489.) This seminar is to be taken concurrently with 495 or SW 495. May not be taken for credit if credit has been earned in 389 or SW 289. Prerequisite: consent of instructor.

491-1 to 6 Independent Study in Community Development. Supervised individual study and projects in keeping with the needs of each student. Prerequisite: consent of instructor.

495-1 to 6 Advanced Field Services Practicum in Southern Illinois. (Same as Social Work 495.) This course is directed at upperclassmen and graduate students volunteering service to community, social service, or health

agencies in southern Illinois. Credit based on time spent in direct service. Approval of agency required for registration. May not be taken for credit if credit has been earned in 295 or SW 295. Mandatory Pass/Fail for undergraduates.

497-1 to 12 (1 to 3 per topic) Seminar in Community Development. The identification and analysis of special problems in community development. **(a)** Project funding, evaluating, and reporting; **(b)** central and peripheral systems in community development; **(c)** community development cooperatives and credit unions; **(d)** research problems and methods; **(e)** special problems. Credit limited to not more than three per topic and not more than 12 total.

500-3 Research Seminar in Community Development. Introduction to research design, theory, sampling, data collection (both qualitative and quantitative), information retrieval, data analysis, and research criticism. Content based on community issues and concerns. Students are encouraged to incorporate their interests and projects into the course work.

501-4 Small Group Process in Community Development. This course combines theory and laboratory methods in giving the student greater awareness of the dynamics of individual interaction in small groups. Such issues as authority, leadership, power, trust, decision making, communication, problem solving, goal setting and attainment, giving and receiving feedback, resource utilization, and evaluation are covered in both theory and laboratory sessions.

502-3 Community and Change. Analyses of causes of social problems and methods for planned change at community level. Local community problems are examined in the context of wider socio-economic and political settings. Changing patterns of community in the United States and elsewhere are explored.

503-3 Community Development Practice. Focuses upon a range of community development problems, models, and practical skills. Observation of field consultants, community organizers and agencies, and persons skilled in and programs demonstrating distinctive approaches to community development. Prerequisite: 401.

589-2 Community Development Internship Seminar. To prepare student for supervised field internship experience. Must be taken concurrently with (or as a prerequisite to) 595, Internship.

593-1 to 6 Individual Research in Community Development. Enables an advanced student to do independent study in community development under the supervision of a faculty member or to pursue work on a terminal research report or advanced field project. Prerequisite: 500 and consent of instructor.

595-1 to 8 Internship. A supervised field experience to acquaint students with problems, situations, and challenges typical of community development work. Students develop a community-based project which allows them to gain experience while demonstrating proficiency in appropriate skills. Personal growth and professional potential are considered in evaluating the intern's field performance. Seven credit hours (350 field hours) are required for the M.S. degree; additional work may be taken as elective hours, calculated at 50 clock hours per semester hour. Graded *S/U* only. Prerequisite: 589 or concurrent enrollment and consent of internship coordinator.

599-1 to 6 Thesis Research. Credit is given for work accomplished on a master's thesis when it is accepted and approved by the thesis committee. Prerequisite: 500 and approval of thesis committee chair.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Computer Science

401-3 Computer Architecture. Review of logical circuit design. Hardware description languages. Algorithms for high speed addition, multiplication, and division. Pipelined arithmetic. Implementation and control issues using PLA's and microprogramming control. Cache and main memory design. Input/Output. Introduction to interconnection networks and multiprocessor organization. Prerequisite: 306 and 315 each with a grade of *C* or better.

411-3 Programming Languages. Study of the significant features of existing programming languages with particular emphasis on the underlying concepts abstracted from these languages. Includes formal specification of syntax and semantics, representation and evaluation of simple statements, grouping of statements, scopes and storage allocation, procedures. Prerequisite: 220 and 302 each with a grade of *C* or better; a working knowledge of at least two of the high-level languages covered by the 311 courses is recommended.

414-3 Operating Systems. An extended treatment of the components of operating systems, including I/O programming, memory management, virtual memory, process management, concurrency, device management and file management. Prerequisite: 306 and 330 each with a grade of *C* or better and a working knowledge of the language C.

416-3 Compiler Construction. Introduction to compiler construction. Design of a simple complete compiler, including lexical analysis, syntactical analysis, type checking, and code generation. Prerequisite: 411 with a grade of *C* or better.

430-3 Database Systems. A comprehensive treatment of database systems, including network, hierarchical, and relational systems. Prerequisite: 330 with a grade of *C* or better.

435-3 Software Design and Development. An exercise in the analysis, design, implementation, testing, and maintenance of a large modular application system. Team production of a system is the focal point for the course. Topics include the system life cycle, system specification, human interfaces, modular design, improved programming techniques, and program verification and valida-

tion. Prerequisite: 306 and 330 each with a grade of *C* or better.

436-3 Artificial Intelligence I. Search and heuristics, problem reduction. Predicate calculus, automated theorem proving. Knowledge representation. Applications of artificial intelligence. Parallel processing in artificial intelligence. Prerequisite: 315 with a grade of *C* or better; at least one of 311L or 311P or concurrent enrollment.

440-3 Introduction to Computer Networks. Design and analysis of computer communication networks. Topics to be covered include queuing systems, data transmission, data link protocols, topological design, routing, flow control, security and privacy, and network performance evaluation. Prerequisite: 306 and 315 each with a grade of *C* or better and Mathematics 380.

447-3 Introduction to Graph Theory. (Same as Mathematics 447.) Introduction to theory of graphs, digraphs, and networks and applications to electrical systems and computer science. Topics include blocks and cutpoints, Eulerian graphs, trees, cycle and cocycle spaces, planarity and Kuratowski's Theorem, connectivity and Menger's Theorem, Hamiltonian graphs, colorability and Heawood's Theorem, flows in networks and Ford-Fulkerson Theorem, critical path analysis. Prerequisite: 315 and Mathematics 221 or Mathematics 319.

449-3 Introduction to Combinatorics. (Same as Mathematics 449.) An introduction to combinatorial mathematics with computing applications. Topics include selections and arrangements, generating functions, recursion, inclusion and exclusion, coding theory, block designs. Prerequisite: 315 or Mathematics 319, or consent of department.

451-3 Introduction to Automata and Theory of Computing. The fundamental concepts of the theory of computation including finite state acceptors, formal grammars, Turing machines, and recursive functions. The relationship between grammars and machines with emphasis on regular expressions and context-free languages. Prerequisite: 306 and 315 each with a grade of *C* or better.

455-3 Design and Analysis of Computer Algorithms. An extensive treatment of the design, analysis and complexity of algorithms. Searching/sorting algorithms, polynomial and matrix algorithms, graph theoretic algorithms. Introduction to complexity theory. Prerequisite: 315 and 330 each with a grade of *C* or better and Mathematics 380.

464-6 (3, 3) Numerical Analysis. (Same as Mathematics 475.) An introduction to the theory and practice of computation with special emphasis on methods useful with digital computers. Topics include the solution of nonlinear equations, interpolation and approximation, numerical differentiation and integration, solution of differential equations, matrix calculations and the solution of systems of linear equations. Prerequisite: for a, Mathematics 221 and 250 and a working knowledge of FORTRAN; for b, 464a and Mathematics 305.

470-3 Computer Simulation Techniques. Applications and rationale. Design and analysis of discrete simulation models. Generation of random sequences and stochastic variates. Simulation languages. Prerequisite: 202 and Mathematics 380.

471-3 Introduction to Optimization Techniques. (Same as Mathematics 471.) Nature of optimization problems. General and special purpose methods of optimization, such as linear programming, classical optimization, separable programming, integer programming, and dynamic programming. Prerequisite: 202 and Mathematics 221 and 250.

472-3 Linear Programming. (Same as Mathematics 472.) Nature and purpose of the linear programming model. Development of the simplex method. Application of the model to various problems. Duality theory. Transportation. Assignment problem. Postoptimality analysis. Prerequisite: 202 and Mathematics 221.

485-3 Computer Graphics. Study of the devices and techniques for the use of computers in generating graphical displays. Includes display devices, display processing, transformation systems, interactive graphics, 3-dimensional graphics, graphics system design and configuration, low and high level graphics languages, and applications. Prerequisite: 220 and 302 each with a grade of *C* or better; Mathematics 150 and 221 are recommended.

490-1 to 6 (1 to 3 per semester) Readings. Supervised readings in selected subjects. Prerequisite: consent of instructor and department.

491-1 to 4 Special Topics. Selected advanced topics from the various fields of computer science. Prerequisite: consent of instructor.

492-1 to 6 (1 to 3 per semester) Special Problems. Individual projects involving independent work. Prerequisite: consent of department.

493-1 to 4 Seminar. Supervised study. Preparation and presentation of reports. Prerequisite: consent of instructor.

501-3 Advanced Computer Architecture. Hardware and software elements of multiprocessors, multicomputers, pipeline and array machines, data flow architecture, and other state-of-the-art architectures. Design principles related to machine structures, interconnection networks, control software and hardware, data storage, and access. Prerequisite: 401.

502-3 Design and Analysis of VLSI Systems. The theory, technology, fabrication, and design of digital integrated circuits that are commonly used in modern computers. Construction and analysis of algorithms for VLSI design such as: PLA minimizer and folder, design rule checker, circuit extractor, and router. Silicon complier. Prerequisite: 401.

503-3 Fault-Tolerant Computing Systems. An introduction to different aspects of fault-tolerance in computing systems. Concurrent checking techniques. Redundancy techniques. Evaluation methods. System-level diagnosis and fault-tolerant VLSI architectures. Prerequisite: 401.

511-3 Formal Specification of Programming Languages. A survey of modeling techniques and meta languages for the formal specification of the syntax and semantics of high-level programming languages. Prerequisite: 411.

512-3 Declarative Programming. An advanced level course on nonprocedural programming with emphasis on logic programming, pure functional programming, and the characteristics of the

declarative style common to these two paradigms. Topics include logic programming, functional programming, implementation consideration for each along with current research topics in the areas. Prerequisite: 411.

514-3 Advanced Operating Systems. Rigorous treatment of advanced topics in operating systems. Multiprocessor and distributed operating systems. Highly concurrent machines. Performance analysis of memory management and scheduling algorithms. Security in operating systems. Prerequisite: 414.

516-3 Advanced Compilers. A continuation of 416 including advanced topics in lexical and syntax analysis, error recovery, sematic analysis, code optimization, and compiler compilers. Prerequisite: 416.

530-3 Advanced Data Base System. A detailed treatment of advanced topics in data base systems including, but not limited or restricted to, relational database theory, query optimization, recovery techniques, concurrency control, distributed database systems, security and integrity, and database machines. Prerequisite: 430.

532-3 to 6 Topics in Information Systems. A detailed study of two or three topics relevant to information systems. Topics may include but are not limited to sorting, searching, information retrieval and automatic text processing, database security and encryption, distributed databases, and data communication. Prerequisite: 430 and consent of instructor.

536-3 Artificial Intelligence II. Theorem proving, the Resolution Principle, strategies, and achievements. Program verification. Natural language processing. Other selected topics. Prerequisite: 436.

540-3 Parallel Processing. An advanced treatment of the theory and implementation of parallel processing. Topics include architectural considerations, parallel programming on multiprocessor and multicomputer systems, and the identification and exploitation of parallelism in algorithms. Prerequisite: consent of instructor.

553-3 Formal Languages and Automata. The Chomsky hierarchy of formal grammars and the corresponding classes of automata. Turing machines and basic concepts of computability. Recursive and recursively enumerable languages. Closure properties. Undecidable problems about Turing machines and context-free languages. Deterministic context-free languages and the construction of LR parsers. Prerequisite: 451.

555-3 Theory of Computability. Turing machines and other models of computation. Computable functions. Church's thesis. Solvable and unsolvable problems. Introduction to complexity theory including the classes P and NP. Polynomial time approximation algorithms for NP-complete problems. Prerequisite: 451.

564-1 to 12 Advanced Topics in Numerical Analysis. (Same as Mathematics 572.) Selected advanced topics in Numerical Analysis chosen from such areas as: approximation theory; numerical solution of initial value problems; numerical solution of boundary value problems; numerical linear algebra; numerical methods of optimization; functional analytic methods. Prerequisite: consent of instructor.

570-3 to 9 per topic (3,3,3) Topics in Operations Research. (Same as Mathematics 570.) **(a)** Netflows. Builds on network and generalized network models for the transportation, transhipment, assignment, shortest path, maximal flow. Prerequisite: 472 or MATH 472. **(b)** Advanced computer simulation. Review of GPSS. Advanced topics in GPSS. Generation of random variates. Validation, parametric, and nonparametric tests. Design of experiments, optimization, parameter tuning. Analysis of variance, spectral analysis, and variance reduction. Prerequisite: 470 and MATH 480 or 483. **(c)** Large scale linear programming. Advanced L.P. techniques for sparge matrices and reinversion routines. Prerequisite: 472 or MATH 472. **(d)** Nonlinear programming. Integer programming with branch and bound and cutting plane methods for solving integer programming problems. Basic dynamic programming with emphasis on the methods and applications. Prerequisite: 472 or MATH 472.

585-3 Advanced Topics in Computer Graphics. Study of computer graphics for realistic image synthesis. Object modeling and associated date structures. Advanced rendering techniques such as raytracing and radiosity. Efficiency considerations. Image composition and compression. Current advances and research problems in realistic computer graphics. Prerequisite: 485.

586-3 Pattern Recognition and Image Processing. An introduction to the area of computer vision for the purpose of restoration, segmentation, encoding, analysis, and recognition of pictures. Topics include: image transforms, edge detection, smoothing, filtering, pseudo-coloring, syntactic methods in scene analysis, parametric decision theory, non-parametric decision theory, linear discriminant functions, parameter estimation, supervised learning, and unsupervised learning. Prerequisite: 220 and MATH 380 or consent of instructor.

590-1 to 9 Readings. Supervised readings in selected subjects. Graded *S/U* only. Prerequisite: consent of instructor and department.

591-1 to 9 (1 to 3 per topic) Special Topics. Selected advanced topics from the various fields of computer science.

592-1 to 6 (1 to 3 per semester) Special Problems. Individual projects involving independent work. Graded *S/U* only. Prerequisite: consent of department.

593-1 to 4 Seminar. Preparation and presentation of reports. Graded *S/U* only. Prerequisite: consent of instructor.

599-1 to 5 Thesis. Minimum of three hours to be counted toward a master's degree. Prerequisite: consent of department.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Curriculum and Instruction

400-2 Simulation and Gaming. The role of simulation and gaming in instruction, the availability of commercial games and simulation devices, and the theoretical backgrounds used in constructing teacher-made games are to be examined.

402-3 Education for Disadvantaged and Culturally Different Students. The student examines the characteristics of behavior and learning patterns of culturally different and socioeconomically disadvantaged children. Content also includes school adjustment, experiential background, self-concept, language development, and appropriate teacher behaviors and teaching strategies.

404-3 Infant Development. Current theories and knowledge concerning growth and development of infants with related laboratory field experiences. Prerequisite: 237 or Psychology 301 or equivalent.

405-4 Methodologies For Group Care of Infants and Toddlers. Application of theories of development of children up to age 3 in a care and stimulation practicum. Development of competencies and skills needed by infant/toddler specialists and professionals. Three hours seminar, two hours practicum. Prerequisite: 404 or consent of instructor.

407-3 to 9 (3 per topic) Diagnostic and Corrective Techniques for the Classroom Teacher. A presentation of diagnostic and remediation techniques with emphasis placed on appropriate methods and materials to be used in classrooms in the areas of **(c)** language arts, **(e)** mathematics, and **(f)** reading. Prerequisite: special methods course in field selected by student and/or consent of instructor.

409-3 Creative Teaching. To assist pre- and in-service teachers in acquiring methods and materials that will improve instruction in the public school classroom, with special attention to the characteristics and needs of students. Prerequisite: Education 302.

410-2 Creative Writing in the Public School. Techniques of encouraging creative writings in the schools.

412-3 to 15 (3 per topic) Improvement of Instruction in Early Childhood Education (Preschool-Grade 3). Examines recent findings, current practices, and materials used in early childhood education in the fields of **(c)** language arts, **(d)** science, **(e)** mathematics, **(f)** reading, and **(g)** social studies. Prerequisite: specialized methods course for the field of study selected by the student.

413-3 Language Development of the Young Child, 0–8 Years. The normal language development and communication skills of the young child will be the focus of this course; attention will be given to an integrated, holistic philosophy toward development and learning in young children ages 0-8; specifically focussing upon social and environmental influences on the development of language and literacy, students will observe, listen, record, and analyze samples of young children's communication.

414-3 Practicum in Parent-Child Study. Designed to increase student's ability to work with parents and parent groups through an awareness of factors in the parent-child relationship and knowledge of current research and methods in parent education. Integration with infant and child development laboratories and related field experience. Prerequisite: 227, 237, or equivalent.

415-3 Modern Approaches to Teaching Middle School Mathematics (Grades 4-8). Examines current mathematics materials and teaching approaches. Hands-on experience with a multitude of teaching aids including microcomputers and problem solving materials. Student exchange of ideas and discussion of activities for classroom use. Prerequisite: 315 or consent of instructor.

417-3 Administration of Pre-School Programs. Planning and organizing programs for pre-school or residential facilities including budgeting, staffing, programming, and evaluation. Prerequisite: 318 and 319.

418-3 History and Philosophy of Early Childhood Education. A survey of the history and philosophies of early childhood education with its implication for current program practices. Students' analysis of their personal philosophy of early childhood education. Prerequisite: 316, 318, senior or graduate standing.

419-3 Parent Involvement in Education. Materials, techniques, and resources suitable for use by teachers in helping parents and teachers to understand how they can help each other in the partnership responsibilities of the education of children from a variety of backgrounds. Prerequisite: 317, student teaching, or consent of instructor.

420-3 Teaching the Adult Functional Illiterate. The emphasis in the course will be on understanding the problems of the individual whose literacy level does not permit full participation in the economic, social, and civic opportunities available to the majority of citizens. Prerequisite: permission of instructor.

423-3 Teaching Elementary School English Language Arts. Oral and written communication processes with emphasis on the structure and process of the English language arts in the elementary school. Specific attention to the fundamentals of speaking English, writing, spelling, and listening. Study of learning materials, specialized equipment and resources.

424-3 Teaching Elementary School Social Studies. Emphasis on the structure and process of teaching social studies in the elementary school setting. Specific attention to the fundamentals of developing social studies objectives, planning units, developing a general teaching model, organizing the curriculum, and evaluating behavioral

change. Study of learning materials, specialized equipment, and resources.

426-3 An Introduction to Teaching Elementary School Science. Content and methods of elementary school sciences, grades K-8. Emphasis on the materials and strategies for using both traditional and modern techniques of science education. One or more field trips.

427-4 Science Process and Concepts for Teachers of Grades N-8. (Same as Botany 462.) Specifically designed to develop those cognitive processes and concepts needed by elementary school teachers in the teaching of modern science programs. Lecture three hours per week, laboratory two hours per week. One or two additional field trips required.

428-3 Inquiry Skills for Teaching Junior and Senior High School Science. The major focus will be the application of inquiry skills as used in all areas of science instruction at the junior and senior high school levels; students will be expected to demonstrate mastery of basic and integrated science process skills through conducting and reporting results of science investigations.

435-3 Literature for Children. Studies types of literature; analysis of literary qualities; selection and presentation of books and other media for children; and, integration of literature in preschool, elementary, and library settings.

436-1 Bibliography and Literature of Education. Introduction to the use of library resources for research in education. Includes bibliographies in education, the periodical literature, Office of Education publications, dissertation and thesis indexing services, and the Educational Resources Information Center (ERIC) materials. Students will learn to search the literature in preparation for literature review and will compile bibliographies in their own fields of interest.

437-3 Instructional Technology in Training Programs in Business and Industry. Examines the role that performance and instructional technology plays in current training practices in business and industry. The organization, staffing, budgeting, and evaluation of training and development departments is presented. The kinds of performance problems typically encountered by corporate training departments are addressed. Field trips are expected.

438-3 Introduction to Technical Services. Organization of library materials. Emphasis on cataloging and classification. Includes acquisition, processing, and circulation of materials. The Dewey Decimal classification system and Sears list of subject headings are stressed. Laboratory assignments.

439-3 Basic Reference Sources. Introduction to the principles and methods of reference work. Concentration on the study and examination of the tools which form the basic reference collection of the school and the community college library.

440-3 Selection of School Library Media. Evaluation of print and non-print materials, resources, and services; competencies for efficient purchasing and selecting of library materials. Includes selection principles and problems for elementary, secondary, and community college libraries.

442-4 Administration of the School Media Program. Functions and management of elementary and secondary school library media programs with emphasis on services, personnel, financial aspects, facilities, and evaluation. Current issues and trends as reflected in the literature. Field trips to school library media centers.

445-3 Library Media for Young Adults. The selection and use of books and other educational media for students in the junior high and senior high school.

450-3 Photography for Teachers. Photography as a tool of communication in the modern school. Techniques of camera handling, visually planning a story, macro-photography, and color slides. A $10 laboratory fee is required.

451-3 Photographic Preparation of Educational Media. Techniques of photography used in producing prints, overhead transparencies, daylight slides, high contrast materials, picture stories, filmstrips, and other photographic instructional materials. Prerequisite: 450 or consent of instructor. A $10 laboratory fee is required.

452-3 Small Format Video Production in Education. An introduction to small format black-and-white and color video equipment in educational settings. Emphasis is on understanding the role of video as an instructional and informational tool and on the principles of design that determine instructional video's effectiveness.

453-3 Production of Educational Media I. Principles, skills, and techniques in the design and production of basic nonphotographic educational media. Experience includes applying lettering, coloring, and mounting techniques to projected and nonprojected media. A $10 laboratory fee is required.

455-3 Design and Development of Self-Instruction Systems. Introduction to the theory and practice of self-instruction systems with a particular emphasis on the creation of instruction for mastery. Various self-instruction systems are reviewed and procedures for designing, developing, and evaluating these systems are discussed. Includes planning a teaching unit and creating a self-instruction package for the unit.

458-3 Classroom Teaching with Television. Classroom utilization of open and closed circuit television. Emphasis is placed on the changed role of the classroom teacher who uses television. Evaluation of programming, technicalities of ETV, and definition of responsibilities are included. Demonstration and a tour of production facilities are provided.

462-3 Middle and Junior High School Programs. Focuses on the development of middle and junior high school curriculum and the identification of instructional activities which relate to the pre and early adolescent student. It is anticipated that the student will be able to plan and develop teaching units and evaluate procedures complementary to this portion of the school structure.

464-2 Student Activities. Analysis of extra-class activities and programs in public schools with a focus on the status, trends, organization, administration, and problems.

465-3 Advanced Teaching Methods. The focus is on a variety of teaching methods and strategies which are appropriate for secondary and/or post-secondary educators. Both individual and group methods are emphasized.

467-3 Methods and Materials in the Education of the Gifted. Content focuses on the most appropriate instructional strategies and materials to be utilized with the gifted. Time spent practicing teaching models, designing materials and developing teaching units. Emphasis placed on techniques for individualizing instruction for the gifted and talented students.

468-3 Science Methods for Junior and Senior High Schools. A performance-based approach to instructional skills common to teaching natural science at the junior and senior high school levels. Three class hours and one micro teaching laboratory hour per week. Prerequisite: Education 302 or consent of instructor.

469-3 Teaching Social Studies in the Secondary School. Emphasis is placed upon instructional strategies and curricular designs in social studies at the junior and senior high school levels.

480-3 Introduction to Computer Based Education. Introduction to microcomputers and their uses in the classroom, including computer evolution, languages and authoring systems, instructional modalities, word processing, instructional management, and software evaluation. Utility functions and basic commands in programming are also introduced.

481-3 Instructional Applications of Mainframe Computers. Design, development, and programming of computer-assisted instructional materials using interactive, timesharing computer systems. Study of lesson design and programming, including branching and program flow, display techniques, response judging, teaching strategies, organization, and style.

483-6 (3, 3) Instructional Applications for Microcomputers. A study of the development and use of microcomputers systems in educational settings. Emphasis is upon the characteristics, capabilities, applications, and implications of microcomputers and microcomputer lessons, with case studies of their integration into the teaching, learning process.

486-3 Instructional Authoring Systems. Designed to give students experience using authoring systems, languages and utilities for the design, production, and integration of computer assisted instruction into educational settings. Tools will include Superpilot, Author, and various commercial and consortium authoring tools. Prerequisite: 480 or consent of instructor.

495-2 to 8 Field Experience. Supervised learning experiences in community nursery schools and public agencies. Eight hours maximum for students enrolled in preschool certification specialization only. Other students limited to an enrollment of six hours maximum. Prerequisite: consent of instructor.

496-2 to 6 (2 to 4 per semester) Field Study Abroad. Orientation and study before travel, readings, reports, and planned travel. Includes visits to cultural and educational institutions. Maximum credit hours in any term is 4.

498-1 to 15 (1 to 3 per topic) Workshops in Education. Critical evaluation of innovative programs and practices. Acquaints teachers within a single school system or in a closely associated cluster of school systems with the philosophical and psychological considerations and methods of implementation of new programs and practices in each of the following areas: **(a)** curriculum, **(b)** supervision for instructional improvement, **(c)** language arts, **(d)** science, **(e)** mathematics, **(f)** reading, **(g)** social studies, **(h)** early childhood education, **(i)** elementary education, **(j)** the middle school, **(k)** secondary education, **(l)** school library media, **(m)** instruction, **(o)** environmental education. **(p)** children's literature, **(q)** family studies, **(r)** computer based education, **(s)** gifted and talented education, and **(t)** teacher education. Maximum of six hours toward a master's degree. Prerequisite: consent of instructor.

500-3 Introduction to Research Methods in Education. An introduction to research methodology as it is applied in carrying out educational studies. Basic skills of planning, executing, and reporting educational research will be studied and applied, with the construction of a research proposal as a term project.

501-3 Organization and Administration of Reading Programs. For reading specialists, consultants, supervisors, and instructional leaders. Recent trends in organization, administration of reading programs, K-community college; materials, equipment, budget for special programs; study of roles of various personnel; and in-service preparation programs. Specific problems of class members are studied. Prerequisite: 512 or 561.

503-3 Introduction to the Curriculum. Deals with the nature, purposes, and functions of curriculum planning and development; curriculum design and organizations; curriculum implementation and maintenance; and curriculum evaluation as each component relates to the total curriculum.

504-3 Systematic Approaches to Instruction. Gives graduate students an opportunity to investigate, discuss, and apply systematic approaches to instruction. Special emphasis is given to that element of the instructional system which allows for the integration of instructional media into the process.

506-3 Professional Services for Diverse Family Structures. Case analysis of different family structures through seminar teams. Each team will be responsible for analysis of the interaction of the family structure and the economic, nutritional, and socializing activities carried out within the family-household. Role and sources of assistance through current programs will be included. Prerequisite: consent of instructor.

507-3 Impact of Public Intervention on Family Life. An analysis of implications of pending and existing legislation as it relates to the economic, nutritional, and interactive aspects of the family treated as a system. Prerequisite: consent of instructor.

508-3 Systematic Observation and Analysis of Instruction. Students will learn to use conferencing techniques and to construct and use valid and reliable systematic observation instruments to provide the basis for analysis and feedback about classroom instruction.

509-3 Foundations of Environmental Education. Designed specifically to provide teachers, administrators, and curriculum specialists with the knowledge and skills necessary to implement environmental education strategies in both ele-

mentary and middle schools. Includes work in ecological foundations, programs currently in use, unit designs, methods, and research. One or two field trips may be required.

510-3 Values Education Curriculum. Alternative views of the impact of schooling on children's values will be explored. Current curricular approaches to moral education will be examined with special emphasis given to values clarification and the cognitive-developmental approach of Lawrence Kohlberg. Psychological and philosophical assumptions underlying the major approaches to moral education will be critically examined.

511-3 Seminar in Psychology of Elementary School Subjects. Psychological principles of learning theories as applied to the mastery of materials used in elementary and early childhood education school subjects. Emphasis is placed on implications of theories of learning for curriculum development and instruction.

512-3 Reading in the Elementary School. First course in the reading sequence. Survey of the reading process. Introduction to factors affecting the reading process, the common core of skills, teaching strategies, materials, and research.

513-3 Kindergarten-Primary Reading. A survey of problems and methodology in the developmental reading program for the primary grades. Emphasis placed upon prevention of reading difficulties.

514-3 The Pre-School Child. Growth of the child from birth to six years with emphasis on the various aspects of growth and the interrelationships.

515-3 Advanced Remediation in Mathematics. Strategies for the design of prescribed systematic instruction for correcting identified mathematics difficulties. Experience in designing and preparing materials for corrective purposes. Prerequisite: 407E or consent of instructor.

516-3 Teaching Mathematics in the Elementary School. Master's degree level course which acquaints the student with approaches to teaching, development of curriculum materials, and authoritative positions on the mathematics of grades K-8. Emphasis on teaching aids, problem solving, and recent developments at this level. Prerequisite: 315 or consent of instructor.

517-3 Early Childhood Programs: Organization and Administration. Presents an overview of the organization and administration of programs for children ages three to eight with experiences in planning for operating and administering such programs. Prerequisite: 316, 518, or consent of instructor.

518-3 Early Childhood Curriculum and Methods. A survey of current problems and practices in early childhood education for children from three to eight years of age, with emphasis on reading in current research literature. Prerequisite: consent of the instructor.

519-3 Early Child Development Through Home and Preschool. The normal health development of children as it takes place in the home and is promoted by the curriculum of early childhood facilities.

520-3 The Language Arts in Bilingual Classrooms. Designed for the teacher who wants to develop the expertise necessary to provide appropriate language arts activities for children in a bi- or multi-lingual classroom. Specific areas covered include the basics of second language learning, assessment of language ability, high motivation language development activities, resource identification and utilization, and evaluation of performance and of available materials, textbooks, and equipment.

521-4 Diagnosis and Correction of Reading Disabilities. Students review causes of reading difficulties, use observation and interview procedures; standardized tests, instruments, and informal inventories; analysis techniques; and prepare materials for corrective purposes. Each student diagnoses and treats a reading disability case under supervision. Prerequisite: 512 or 513 or 561, 470F and consent of instructor.

522-3 Teaching Reading Skills to College Students. Designed to discuss, develop, and demonstrate techniques of teaching reading skills to college students. A very important aspect of this course is practical tutoring sections. Prerequisite: permission of instructor.

523-3 Language Arts in the Elementary School. The practical bearing of investigation and theory on the improvement of current practices in the teaching of the language arts other than reading. Attention given to evaluation of teaching materials in these areas. Prerequisite: 423.

524-3 Teaching the Social Studies in the Elementary School. A study of theory and practices of teaching and developing programs in elementary school social studies. Particular attention to be given to trends and issues in social studies. Various social studies models will be examined and evaluated for practical use. Students must demonstrate behaviorally the competencies and skills related to successful performance in the teaching of social studies.

525-3 Applications of Microcomputers to Mathematics Education. Emphasis placed on using the microcomputer as a tool in problem solving. Instruction in programming in Pascal and operating the Apple microcomputer with special attention to practical use of materials in the mathematics classroom and exploration of various other uses of the microcomputer.

526-3 Problems in Elementary School Science Education. Emphasis upon identifying problems and trends within elementary school science education and planning for research in this field. Prerequisite: 426.

527-3 Advanced Family Studies. A study of factors that promote satisfactions with the immediate family; planning and preparing teaching units, and source materials in this field.

528-3 Methods for Teaching Mathematics in the Preschool and Early Childhood Grades (Pre K-3). Acquaints the student with the learning characteristics of children and teaching methods at grades pre K-3. Emphasis on concrete manipulative teaching aids, learning readiness, and diagnosis of learning difficulties. Prerequisite: 315 or consent of instructor.

529-3 Modern Approaches to Teaching Secondary School Mathematics. (Same as Mathematics 511.) Topics will include problem solving, applications of mathematics, and teaching proofs in secondary school mathematics. Practical class-

room use of materials will also be emphasized. Prerequisite: consent of instructor.

530-3 Teaching Problem Solving in School Mathematics (Grades K-8). Designed to acquaint teachers with problem solving processes and how to integrate problem solving into their teaching. Emphasis is placed on teaching the process of problem solving. Prerequisite: graduate standing or consent of adviser.

531-3 The Elementary School Curriculum. An introductory course in curriculum designed to assist teachers and administrators in making operational decisions in elementary education which are based on knowledge of foundations of elementary education, organization of learning experiences, research in specialized areas, materials and methods, instructional programming and evaluation. Students are required to exhibit curriculum competencies through the creation of products and through demonstration of skill.

532-3 Courseware Design and Analysis. The analysis of principles and strategies employed in the design of computer based courseware and computer based training materials. Emphasis is upon examining educational, social, and psychological learning principles and the assumptions used by authors of computer software in the design of K-12 software and computer based training materials.

533-3 Instructional Leadership in Elementary Education. A study of research and related literature concerning various instructional leadership styles and behaviors. Major attention is given to such behaviors as they apply to the local school and the individual classroom situation.

534-3 Organization of the Elementary School. An analysis of types of elementary school organizations with special attention to influence of school organization upon the educational program. Application of research findings to selection and use of materials of instruction. Special consideration to classroom teacher's professional problems.

538-3 Organization of the Nonbook Collection. The application of standard library techniques to the organization, storage, distribution, and physical processing of all types of nonbook materials with emphasis on cataloging and classification. Prerequisite: 438.

539-3 Reference Services of the Media Program. Designed to round out the student's preparation for reference work in an elementary school, secondary school, or community college media program. The techniques of developing a reference service with attention to the needs of special user groups. Preparation of bibliographies on subjects of current topical interest and a term project on a specific issue or problem. Prerequisite: 439.

540-3 Mass Communication in Education. The communication theories of recognized authorities in the field will be studied. These theories will be applied to the use of mass media in education. Radio, television, comic books, newspapers, magazines, and motion pictures will be discussed.

542-3 Administration of an Educational Media Center. Designed to further the training of specialists in selected issues associated with the supervision and management of integrated programs of media services. Current and emerging administrative roles, responsibilities, and practices are examined in the context of providing effective and efficient services to media users. Prerequisite: 442 or consent of instructor.

543-3 Automation of Information Centers. A study of selected retrospective, current, and emerging characteristics, capabilities, applications, and implications of automation to information centers located in public schools, colleges, communities, government agencies, and the private sector.

544-3 Community College Media Programs. A survey of community college media programs in the U.S., their philosophy and objectives, practices and procedures, and research in the field. Prerequisite: consent of instructor.

546-3 The Library of Congress Classification Scheme. The study of the Library of Congress classification scheme as it is utilized in community college libraries. Prerequisite: 438.

548-3 Production of Educational Media II. Advanced use of audio, graphic, and photographic principles and techniques applied to the design and production of educational media to meet specific objectives. Includes application of a basic model of the design process. A $10 laboratory fee is required. Prerequisite: 453 and 450 or consent of instructor.

549-2 Designing Multi-Image Learning Materials. The acquisition of skills in designing, producing, and showing multi-image learning materials. Students should possess photographic skills and a 35 mm camera. A $10 laboratory fee is required.

551-3 Survey of Research and Developments in Educational Media. Survey of research, research techniques, needed research, and new developments and programs in educational media. Prerequisite: consent of instructor.

553-3 Instructional Development. Intended for media specialists and instructional developers, this course applies current research and technology to the solution of instructional problems. The student is guided through the systematic process of identifying instructional problems, specifying objectives, analyzing tasks and learners, organizing resources, specifying methods and media, and assessing outcomes. The role of the instructional developer as a helping professional will also be examined. Prerequisite: 504.

554-3 Utilization of Educational Media. The utilization of print and nonprint materials in instructional implementation and curriculum development. Structured for teachers, media directors, administrators, and instructional designers. The increasing role of technological advances in education is stressed as they relate to learning theory and curriculum development.

555-3 Visual Communication. How to communicate with pictures in the classroom, the design of still and motion pictures, pictures used in teaching perception, and the place of pictures in advertising and communication.

556-3 Learning Discovery Systems in the Computerized Classroom. Survey and use of learning discovery systems for microcomputers, especially LOGO. Course includes microcomputer operation, software utilization, program evaluation, creation and use of microworlds in the class-

room, and cross-curriculum applications. Prerequisite: 480 or consent of instructor.

560-3 Instructional Television. The field of educational broadcasting is explored, with special emphasis on public and school television. History and philosophy are included. Problems of programming and their effect on society are studied. The relationship between broadcasting and the viewing public is investigated, and the responsibility of each is established. Emphasis is also placed upon principles of ITV administration and inservice training.

561-3 Reading in the Secondary School. For the junior and senior high school teachers who desire a foundation in reading. Emphasis placed on the basic skills appraisal of reading abilities, materials of instruction, and methods of teaching reading in the content areas.

564-3 Curriculum Development for Gifted Students. Presentations related to the knowledge and decision-making required to develop curriculum for gifted students, including philosophy, goals, and objectives; designing and sequencing activities; curriculum models for gifted students; evaluation and modification of curriculum. Emphasis is placed on the development of curriculum for gifted students to be used in schools.

566-3 Instructional Strategies for Problem Solving. The focus is on developing those teaching strategies which will foster and enhance problem solving skills and heuristic thinking. Representative of these teaching skills would be inductive and deductive approaches, discovery and inquiry techniques, and questioning strategies.

569-3 Principles and Trends in Secondary School Social Studies Education. An evaluation and study of social studies trends and practices as they are related to curriculum, organization, and instruction at the junior and senior high school and community college levels.

571-3 Secondary School Curriculum. An introductory course designed to explore the nature and development of the curriculum at the secondary school level. Historical perspective and foundations of curriculum are examined. Functional applications to the public secondary schools are emphasized.

572-2 History and Philosophy of Bilingual/Bicultural Education. Surveys major influences in the development of bilingual/bicultural education in the United States and presents the major philosophical positions affecting this development. Students will also choose one or more specific related areas for concentrated investigation.

573-3 Perspectives on the Future and Its Schools. Deals with the future development of education and social trends which will influence that development. Emphasis is placed upon alternative models of education and their social bases.

574-2 Psycho- and Sociolinguistic Considerations in a Bilingual/Bicultural Classroom. Acquaints educators with possible sources of psycholinguistic and sociolinguistic problems in the bilingual classroom and equips them with techniques for utilizing, modifying, and counteracting those influences.

575-3 Critical Issues in Instructional Supervision. Students will examine the history, nature, and evolution of supervision for instructional improvement. Students will be introduced to concepts, theory, and research findings from many fields of study that have implications for today's supervisory process. Supervisory assumptions and practices will be examined in light of current knowledge of teaching effectiveness.

576-3 Critical Issues in Teacher Education. Students will examine critical issues, problems, and trends in teacher education. Emphasis is placed on strategies for clarifying the issues, solving the problems, and examining the possible impact of the trends.

577-3 Seminar in International Mathematics in Education. Deals with goals, contents, teaching methods, teacher training, curriculum development, and research literature on mathematics education at the international level. Prerequisite: graduate standing or consent of adviser.

578-3 Advanced Study of Mathematics Education. Study of the practical and theoretical development of mathematics curricula and instruction, and viewing mathematics curricula and instruction from philosophical and psychological perspectives. Prerequisite: advanced graduate study or consent of adviser.

580-3 Current Trends in Education. Trends, issues, problems in education related to the student, program, school organization, staff, material and media, the school building, and the process of innovation and change.

582-3 Advanced Research Methods in Education. The study and application of advanced skills used in planning, executing, reporting, and utilizing educational research. Prerequisite: 500 or evidence of equivalent research competencies.

583-3 Instructional Theory, Principles, and Practices. Presentation of conceptual formulations and skills concerning instructional theory and principles; foundations of instruction; instructional systems and models; delivery processes (logistics), systems, and maintenance of quality control; and evaluation of teachers and students.

584-3 Curriculum Theory, Foundations, and Principles. Presentation of conceptual formulations concerning curriculum theory and propositions; foundations: philosophy, sociology, and learning theories; the curriculum system and its components; crucial issues in developing a curriculum theory; and theoretical curriculum models: analysis and assessment.

585-1 to 15 (1 to 3 per semester) Topical Seminar. A graduate level seminar that involves the study of special problems and related research associated with practical educational situations. Problems available for critiquing and analyzing are the following: **(a)** curriculum, **(b)** supervision for instructional improvement, **(c)** language arts, **(d)** science, **(e)** mathematics, **(f)** reading, **(g)** social studies, **(h)** early childhood education, **(i)** elementary education, **(j)** the middle school, **(k)** secondary education, **(l)** school library media, **(m)** instruction, **(n)** educational technology, **(o)** environmental education, **(p)** children's literature, and **(q)** family studies, **(r)** computer based education, **(s)** gifted and talented education, **(t)** teacher education. Maximum of six hours toward a master's degree. Prerequisite: consent of instructor.

586-3 Curriculum Design and Development. Presentations concerning educational planning

and curricular decision-making relating to curriculum: aims, goals, and objectives; nature of knowledge, disciplines, and subjects; curriculum structures: sequence and scope; substantive structural models; content and activity selection, product analysis and production; evaluation; and curriculum modification and change.

587-3 Curriculum Implementation and Evaluation. Attention is given to preparing the curriculum specialist to use appropriate techniques and skills to put curriculum programs into practice and to assess the effectiveness of such programs in terms of a wide range of variables which indicate success or need for curricular modification.

589-3 The Work of the Director of Curriculum and Instruction. The role of the director of curriculum and instruction is the focus of this course. Such topics as the background, current status, and tasks and functions of the position are examined. Additionally, such broad areas of the director's role as needs assessment, program planning and evaluation, and in-service education planning are covered. Prerequisite: 586 or 587 or consent of instructor.

590-1 to 15 (1 to 3 per topic) Independent Readings. Directed readings in literature and research in one of the following areas: **(a)** curriculum, **(b)** supervision for instructional improvement, **(c)** language arts, **(d)** science, **(e)** mathematics, **(f)** reading, **(g)** social studies, **(h)** early childhood, **(i)** elementary education, **(j)** middle school, **(k)** secondary education, **(l)** school library media, **(m)** instruction, **(n)** educational technology, **(o)** environmental education, **(p)** children's literature, **(q)** family studies, **(r)** computer based education, **(s)** gifted and talented education, and **(t)** teacher education. Maximum of four hours toward a master's degree. Prerequisite: consent of instructor.

593-1 to 15 (1 to 3 per topic) Individual Research in Education. The selection, investigation, and writing of a research topic under the personal supervision of a member of the departmental graduate staff, in one of the following areas: **(a)** curriculum, **(b)** supervision for instructional improvement, **(c)** language arts, **(d)** science, **(e)** mathematics, **(f)** reading, **(g)** social studies, **(h)** early childhood, **(i)** elementary education, **(j)** middle school, **(k)** secondary education, **(l)** school library media, **(m)** instruction, **(n)** educational technology, **(o)** environmental education, **(p)** children's literature, **(q)** family studies, **(r)** computer based education, **(s)** gifted and talented education, and **(t)** teacher education. Maximum of three hours counted toward a master's degree. Prerequisite: consent of instructor.

594-(2 to 9 per topic) Practicum. For master's degree students: professional consultation, teaching demonstration, practical application of advanced theory, work with clinical cases, or program development implementation, and evaluation in school systems, community colleges, or universities. In addition, may involve reading and research directed to special problems involved in on-site situations. Practicum is available in the following areas: **(a)** curriculum, **(b)** supervision for instructional improvement, **(c)** language arts, **(d)** science, **(e)** mathematics, **(f)** reading, **(g)** social studies, **(h)** early childhood, **(i)** elementary education, **(j)** middle school, **(k)** secondary education, **(l)** school library media, **(m)** instruction, **(n)** educational technology, **(o)** environmental education, **(p)** children's literature, **(q)** family studies, **(r)** computer based education, **(s)** gifted and talented education, and **(t)** teacher education. A maximum of nine hours credit may be applied toward a master's degree. Prerequisite: consent of instructor.

595-(2 to 8 per topic) Internship. Culminating experience for Ph.D. or specialist degree students. Students engage in specialized service areas either in their own or a cooperating school or school system or university. Weekly on-campus or on-site seminar will be held with the intern supervisor. Internship areas are: **(a)** curriculum, **(b)** supervision for instructional improvement, **(c)** language arts, **(d)** science, **(e)** mathematics, **(f)** reading, **(g)** social studies, **(h)** early childhood, **(i)** elementary education, **(j)** middle school, **(k)** secondary education, **(l)** school library media, **(m)** instruction, **(n)** educational media, **(o)** environmental education, **(p)** children's literature, **(q)** family studies, **(r)** computer based education, **(s)** gifted and talented education, and **(t)** teacher education. A maximum of eight hours credit may be applied toward a Ph.D. or specialist degree. Prerequisite: consent of instructor.

596-3 to 6 Independent Investigation. Field study required of each student pursuing for the sixth year specialist degree. The work should be conducted in the setting of the educational system in which the student is employed or where cooperation is extended. The study involves selecting the problem, survey of pertinent literature, recording results, and appropriate interpretations and summarizations. Graded *S/U* only. Prerequisite: consent of instructor and admission to sixth-year specialist degree program.

599-1 to 6 Thesis. Minimum of three hours to be counted toward a master's degree. Prerequisite: admission to master's degree program.

600-1 to 32 (1 to 12 per semester) Dissertation. Minimum of 24 hours for the Doctor of Philosophy degree.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Economics

408-3 Economics and Business Statistics II. A continuation of 308 which includes the construction, interpretation, and use of economic data. Topics include correlation, regression, decisionmaking, index numbers, time series analysis, forecasting, and other statistical techniques used in analyzing economic and business data. This course will not count as graduate credit for economics majors. Prerequisite: 308 or equivalent.

416-3 Money and Banking II. An examination of the principle institutions whose joint actions determine the supply of money in the United States economy. Emphasis is placed on the commercial bank operating as a firm within the Federal Reserve System. Policy issues are examined for the regulation of the banking industry as well as for the control of the domestic money supply. Prerequisite: 315, or 340, or 341, or consent of instructor.

419-3 Latin American Economic Development. Special attention to contemporary policy issues and alternative strategies for development. Among the topics included are inflation and financial reform, international trade and economic integration, foreign investment, and agrarian reform. Prerequisite: 322, or 340, or 341, or consent of instructor.

420-3 The History of American Growth in the 20th Century. An analytical survey of American growth in the present century. Concentrates on problems associated with the United States' role as a world economic power and changes in economic institutions engendered by rapid technological change and the need to cope with such problems as income distribution, equity, the growing public sector, inflation, unemployment, and others. Prerequisite: 340, or 341, or consent of instructor.

425-4 Economics in Geography and Planning. (Same as Geography 422.) Concepts, symbols, language, theory, elementary mathematics of economics, and geography. Individual's preferences, production functions, the firm, markets optimality, externalities, and welfare economics. Elementary mathematics of time and intertemporal criteria. Prerequisite: Geography 300 or consent of instructor.

429-3 International Trade and Finance. Analysis of the pattern and volume of world trade and capital flows; effects of trade and payments on the domestic economy; problems and methods of adjusting to change in the balance of payments. Prerequisite: 340 and 341 or consent of instructor; and Mathematics 117, or 140, or 150, or consent of instructor.

431-3 Public Finance II. State and local. Analysis of the economic effects, problems, and alternative solutions concerning state and local government expenditures, revenues, and debt. Prerequisite: 330 or 340 or 341 or consent of instructor.

436-3 Government and Labor. Influence of government and law on collective bargaining, on the internal operation of unions, and on job discrimination in the public and private sectors. Prerequisite: GEB 114 and 211 or equivalents or consent of instructor.

440-3 Price, Output, and Allocation Theories. A systematic survey of theories of product prices, wage rates, rates of production and resource utilization under conditions of competition, monopolistic competition, oligopoly and monopoly markets. Emphasis is on developing analytical tools useful in the social sciences. Not open to students who have had Economics 340. Prerequisite: 215 or consent of instructor.

441-3 Contemporary Macroeconomic Theory. An examination in the causes of inflation, unemployment, and fluctuations in aggregate economic activity, factors affecting consumption and investment, and the sources of economic growth. Emphasis is on understanding contemporary United States macroeconomic problems and the options for fiscal, monetary, and income policies facing the United States government. Not open to students who have had 341. Prerequisite: 214 or consent of instructor.

443-3 Honors Seminar in Economics. Application of the tools of economic analysis to the study of contemporary social problems. Enrollment limited to economic majors who have a minimum cumulative grade point average of 3.0 or higher in all prior economics courses. Economics graduate students are not permitted to enroll in this course. Prerequisite: 340 and 341; and Mathematics 117, or 140, or 150, or consent of instructor.

450-3 History of Economic Thought. An analytical study of the development of economic ideas, with special reference to historical and societal context, central thrust, and impact. Such benchmark figures as Smith, Marx, Marshall, Veblen, and Keynes are highlighted and major schools of economic thought are identified. Prerequisite: 214 and 215; or GEB 211; or consent of instructor.

465-4 Mathematical Economics I. A systematic survey of mathematical economics. Application of basic mathematical tools to economic analysis, and a restatement of economic theory in mathematical terms. Prerequisite: 340 or 440, and Mathematics 117 or 140, or consent of instructor.

467-3 Mathematical Statistics in Economics. Introduction to the use of statistical inference and distribution theory for measuring and testing economic theory. Prerequisite; Mathematics 117, 140, or 150 or consent of instructor.

471-3 Land Resource Economics. (See Agribusiness Economics 440.)

474-3 Antitrust and Regulation. The theory and practice of government policy toward imperfectly competitive markets. Includes such topics as merger policy, unfair trade practices, regulation of natural monopolies, peak load pricing, safety and environmental regulation, and consumer protection. Prerequisite: 340 or 374.

479-3 Problems in Business and Economics. Application of economic theory and tools of analysis to practical business problems. Cost and demand functions, and forecasting are analyzed from a policy standpoint. Prerequisite: 215; 308 or Administrative Sciences 208; Marketing 304; Mathematics 117, or 140, or 150 or consent of instructor.

481-3 Comparative Economic Systems. Capitalism, socialism, communism, and other forms of social organization are examined from a theoretical point of view. Economic and social theories from Adam Smith and Karl Marx to Milton Friedman and Paul Sweezy will be examined. Prerequisite: 340, or 440, or consent of instructor.

500-3 to 24 (3 per topic) Economics Seminar. A study of a common, general topic in the field of economics with individual reports on special topics. Prerequisite: consent of instructor.

501-1 to 21 Economics Readings. Readings from books and periodicals in economics. Master's

degree students limited to a total of six hours. Prerequisite: consent of instructor and chair.

502-1 to 4 Readings in Resource Economics. (See Forestry 590.)
One hour of credit per semester. Graded *S / U* only.

510-2 Research in Economics: Design, Methodology, and Presentation. Systematic approach to economic research. Includes research planning and design, exploration of the various sources of data, and most frequently used methodology. The last part of the course is concentrated on techniques for communicating the results of research. Prerequisite: consent of instructor.

511-3 Advanced Mathematical Economics. A continuation of topics in 465 with more emphasis on proofs. Topics include economic applications of integration, differential equations, and real analysis. Prerequisite: 465 and MATH 211, or consent of the instructor.

512-3 Seminar in Labor Institutions. Multidisciplinary approach to collective bargaining in the private and public sectors, considering industrial relations theory, and the economic effects of collective bargaining. Readings and cases. Prerequisite: 310 or equivalent or consent of instructor.

517-3 Monetary Theory and Policy. A survey of contemporary monetary theory and related policy issues. Prerequisite: 541 or consent of instructor.

518-3 Monetary Theory and Policy II. Contemporary topics in monetary theory and policy, including analysis of the roles of money in inflation and economic growth, and an appraisal of the conduct and impact of monetary policy. Prerequisite: 517 or consent of instructor.

520-6 (3,3) Economic Development Theory and Policy. **(a)** Classical, neoclassical, and modern contributions to the theory of development; theories of underdevelopment. **(b)** Basic approaches to economic development; laissez-faire; balanced growth; unbalanced growth, role of government; methods of planning; and foreign aid. Must be taken in a,b, sequence. Prerequisite: consent of instructor.

522-3 Microeconomic Foundations of Labor Markets. The approach is theoretical. Topics include the theory of wage and employment determination, labor mobility, labor market imperfections, the special problems of minority group labor, and trade union issues. Prerequisite: 538, or 540b, or consent of instructor.

525-4 Seminar in Economics in Geography and Planning. (Same as Geography 522.) Public expenditure criteria based on free-market allocation, public, private, and merit goods and services, and related planning; expenditure criteria based on comprehensive plans; expenditure criteria and planning in the absence of general optimality; multiple objectives, measurement of benefits and costs, shadow prices, choice of techniques in planning; consideration of uncertainty. Critical evaluations of applied work and models of development projects and programs by students. Prerequisite: 422 or consent of instructor.

530-3 Foreign Trade. Emphasis on the advanced theory of international trade, survey of significant literature in international theory.

507-1 to 4 (1,1,1,1) Practicum in Undergraduate Teaching. Emphasizes teaching methods, source materials, and preparation of classroom materials. All teaching assistants must enroll. Study of more advanced tools of analysis. Prerequisite: 340, or 440, or consent of instructor.

531-3 International Finance. Application of theory to current international economic developments. Empirical studies. Prerequisite: 329 or consent of instructor.

532-3 Economics of Human Resources. The study of institutions and policies designed to solve manpower problems. Emphasizes such topical areas as unemployment, underemployment, manpower training and development, labor market behavior, vocational education, labor problems of the handicapped, the aged, women, and minority groups, health economics, economics of education and poverty. Prerequisite: consent of instructor.

533-3 Public Finance Theory and Practice. Historical development of public finance theories with analysis of their policy implications. Prerequisite: 330 or consent of instructor.

534-3 Economics of Taxation. This course examines from a theoretical and applied point-of-view, various economic aspects of taxation. Other government revenue sources may also be analyzed such as inter-governmental grants and debt. Emphasis is on application of microeconomic theory to problems in taxation. Usual topics include: equity in taxation, shifting and incidence of taxes, excess burden of taxes, other economic effects of taxes, tax reform, debt. Prerequisite: 330 and 340, or 440, or consent of instructor.

540A-3 Microeconomic Theory I. The course provides the basic theoretical knowledge necessary for microeconomic research in business and government. Prerequisite: 340, or 400, or consent of instructor.

540B-3 Microeconomic Theory II. A contemporary course in partial equilibrium analysis. Topics include the theory of the firm, market structure, and the theory of the consumer. The course frequently takes an axiomatic approach; consequently there are many formal statements and proofs of theorems. Prerequisite: 465 and MATH 221, or MATH 150, 221, and 250, or consent of instructor.

540C-3 Microeconomic Theory III. A contemporary course in general equilibrium analysis. Topics include equilibrium in an exchange economy, equilibrium with production, and welfare implications of general equilibrium. The existence and uniqueness of equilibrium and the concept of the core of an economy are studied in detail. Prerequisite: 511, 540B or MATH 352, or consent of instructor.

541-6 (3,3) Macroeconomic Theory I and II. Taken in a, b sequence except with consent of instructor. Prerequisite: 341 or 441 or consent of instructor.

542-6 (3,3) Industrial organization. **(a)** Industrial organization I. A study of the variety of forms of competition among firms. Topics include theories of the firm, oligopoly theory, theories of entry, product differentiation, and innovation. Prerequisites: 440 and 441. **(b)** Industrial organization II. A survey of government policy toward industry. Topics include antitrust: mergers, concentration and unfair trade practices, regulation

of public utilities, peak load pricing, product, safety, and environmental regulation. Prerequisites: 440 and 441.

545-3 Resource Economics. A survey of theoretical and institutional aspects of energy production, distribution, consumption, and regulation. Topics covered include cartel theory, history of energy use, theory of resource exhaustion, models of energy demand and supply, past and current policy issues, and environmental protection. Prerequisite: 467 and 440, or consent of instructor.

546-3 Workshop in Resource Economics. A research seminar on topics related to energy production, distribution, consumption, and regulation. Meetings will be divided among presentations of research of (a) faculty, (b) students, and (c) outside speakers, offered every semester. Maximum of three hours toward master's degree in economics. Prerequisite: 545.

552-3 Seminar in Economic Thought. An exploration of the basic philosophic assumptions which underlie the various types of economic thought with special emphasis upon the historical development of the premises of modern day economic theories. Prerequisite: 450a or b or consent of instructor.

555-3 Seminar in Economic History. An examination of the structural economic changes in various economies throughout the world. Prerequisite: consent of instructor.

562-3 Seminar in Economic Systems. A final, theoretically-oriented examination of economic systems. Includes recent theoretical models; contemporary changes in major economic systems; the emergence of mixed systems. Relates economic, social, and political systems and evaluates attempts to place economic systems within the context of general systems theory. Prerequisite: 481 or consent of instructor.

565-3 Applied Econometric Analysis. Applications of statistical tools to specific economic problems. Numerous examples will be examined in order to achieve this goal. Emphasis will be given to model misspecification, non-classical estimation techniques, data analysis, and simultaneous equations. Prerequisite: 467 or consent of instructor.

566-3 Mathematical Economics II. Linear economic models. Linear programming. Input-output analysis and general equilibrium models. Prerequisite: 340, or 440, or 465, or consent of instructor.

567-6 (3,3) Applied Econometrics I and II. (a) Linear regression analysis as applied to single equation economic models. Problems of least squares maximum likelihood, and asymptotic theory are introduced. Generalized least squares, lagged model, and qualitative dependent variables are analyzed. The emphasis is on both theory and application. **(b)** A continuation of topics introduced in (a) with applications to various areas of economics. To be taken in sequence. Prerequisite: 467 or consent of instructor.

570-3 Seminar in Contemporary Microeconomic Theory. An investigation of recent developments and current controversies in economic theory with emphasis on microeconomic problems. Prerequisite: 540b.

571-3 Seminar in Contemporary Macroeconomic Theory. An investigation of recent developments and current controversies in economic theory with emphasis on macroeconomic problems. Prerequisite: 541b or consent of instructor.

575-6 (3,3) Economic Theory I and II. (a) A rigorous treatment of the foundations of econometrics theory. Asymptotic theory is stressed. The single equation model is developed. **(b)** Rigorous treatment of simultaneous equations systems including identification, limited information estimation, and full information. Properties of dynamic simultaneous equation models are developed. Inference is introduced into models which combine time series and cross-sectional data. To be taken in sequence. Prerequisite: 567b.

583-3 Methodological Foundations of Economics. A systematic analysis of the nature, philosophical content, premises, scope, boundaries, and characteristic methods of economics. The history of economic thought is drawn upon, but major focus is upon the contemporary state of the discipline as well as upon apparent methodological trends. Prerequisite: 340 or 440, and 341, or 441, or consent of instructor.

585-3 Seminar in Social Economy. Interrelations between economic institutions and processes within the larger societal context. Applicable economic, political, and social theory, as well as empirical studies brought to bear. Prerequisite: 340, or 440, or consent of instructor.

590-1 to 8 (1 per semester) Seminar in Contemporary Economics. Presentation and discussion of current research in economics. One hour credit per semester. Graded *S/U* only.

598-1 to 3 Research Paper. Preparation of a research paper for a master's degree. Prerequisite: consent of instructor.

599-1 to 6 Thesis. Minimum of four hours to be counted toward a master's degree. Graded *S/U* only.

600-1 to 36 (1 to 16 per semester) Doctoral Dissertation. Hours and credit to be arranged by director of graduate studies. Graded *S/U* only.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Education

450-1 to 10 Experimental Education. Offered for purposes of testing new and experimental courses and series of courses within the College of Education. Prerequisite: consent of instructor.

550-1 to 10 Experimental Education. Offered for purposes of testing new and experimental courses and series of courses within the College of Education. Prerequisite: consent of instructor.

590-4 Doctoral Seminar in Cultural Foundations of Education. This seminar is one of two courses required for all students pursuing a doctoral program in the College of Education. The primary objectives are to aid in the development

of the doctoral student's own nature and reflective theory of education; to help students pursue their scholarly activities in relation to the whole field of education; and to make the student aware of the

591-4 Doctoral Seminar in Behavioral Foundations of Education. This seminar is one of two courses required for all students pursuing a doctoral program in the College of Education. The primary objectives are to aid the student in describing the attitudes, assumptions, and practices which underlie empirical inquiry; to help the student to recognize the strengths and weaknesses of the various types of research in terms of methodology employed; and to aid the student in identifying and refining a research question and constructing a research design appropriate to answer the research question. Prerequisite: admission to the Ph.D. program in education.

Educational Administration and Higher Education

402-1 to 3 Principles of Student Personnel Group Work. Acquaints the student with group work possibilities and functions in higher education.

420-3 Foundations for Differential Education of the Gifted. The formulation and analysis of foundational bases for differential education of the gifted; i.e., establishment of an epistemological, historical, philosophical, and sociological framework for this emerging subfield of education.

430-3 History of Education in the United States. An historical study of the problems of American education.

432-3 Education and Social Forces. A study of the social forces that shape educational policies in the United States.

454-3 Contrasting Philosophies of Education. An examination of current educational problems and trends in the light of contrasting philosophies of education.

455-3 Introduction to Adult and Continuing Education. Introduces the multifaceted areas of adult and continuing education in traditional and non-traditional settings by reviewing and studying philosophies, directions, program efforts, and activities associated with them.

475-3 Administration of Staff Development Programs in Adult and Continuing Education. Review and examination of the needs, problems, administrative requirement, and alternatives available for staff development in adult and continuing education. Emphasis will be placed on needs assessments, planning, and designing in-service or staff development programs to meet institutional needs and individual professional needs.

495 (3 to 9) (3, 3, 3) Workshop in Adult Education. The foci for these workshops are to provide quality educational experiences for students and practitioners in the field of adult and continuing education in three major areas: **(a)** current issues, **(b)** improvement of instruction and programs in adult education, and **(c)** evaluation in adult education.

500-3 Educational Research Methods. Introduction to educational research and the variant methodologies used in conducting studies within institutional settings. Both quantitative and qualitative approaches will be examined.

501-3 Educational Administration: Tasks and Processes. An examination of the administrative tasks and processes dealing with interaction within the school organization and between the organization and its environment. Components will be viewed for their essential interrelatedness as well as their unique aspects. Emphasis will be placed upon the processes by which change is brought about in dealing with decision making, programming, communication, motivating, controlling, and evaluating.

503-3 Educational Administration: Introduction to Theory. Examination of the various administrative tasks in light of established organizational models and leadership theories. The student will be introduced to a variety of theories, models, and concepts that have pertinence to the field of educational administration. Emphasis will be placed upon the methods of theory construction and the development of a theoretical orientation to the solution of administrative problems. The course draws heavily upon research done in the behavioral sciences.

504-3 An Introduction to Evaluation for Administrators. This course is designed to familiarize prospective and practicing administrators with the areas of personnel, program, and school evaluation. Specific topics include: purposes, constructs, models, instrumentation, procedures, and responsibilities appropriate for school administrators.

507-3 Secondary School Principalship. Deals with problems met specifically by the high school principal. Emphasizes the principal's role in relation to guidance, curriculum, schedule-making, extra-curricular activities, public relations, budgeting of time, etc.

508-2 Student Development Theories. A study of the major theories of human development as applied to college students with implications for the student affairs specialist.

509-3 School-Community Relations and Development. Practical and theoretical aspects of public relations as applied in general and as applied specifically to educational institutions and efforts. Involved are the practical and theoretical considerations of educational institutions assisting in the further development of the community or communities in which they find themselves.

510-3 Higher Education in the United States. An overview of American higher education in historical and sociological perspectives: its development, scope, characteristics, issues, problems, trends, and criticism.

511-3 Organization and Administration of Curriculum. The organization and administration of the curriculum including the elements and sub-elements comprising a curriculum are the primary focus. Emphasis placed on a rationale, resources of scholarship in other disciplines which might be said to be foundational to education. Prerequisite: admission to the Ph.D. program in education.

including the socio-cultural and psycho-philosophical factors, political forces and factors, goals, instructional activities, and evaluation. This course has general application to both elementary and secondary curriculum organization.

512-3 Higher Education in Selected Nations. A study of higher education systems and trends outside the United States and of the role of the university in world affairs.

513-3 Organization and Administration in Higher Education. Theories and practices in governance of various types of higher education institutions with attention to problems of formal and informal structures, personnel policies, decision making, institutional self-study, and societal-governmental relations.

514-3 Foundations of Adult Education. This course reviews the socio-cultural, historical, psychological, economic, and philosophical considerations found in the broad field of adult and continuing education and which serves as a foundation for instructional and curriculum development work in the field.

515-3 College Student Development: Operations and Policies. Study of organization, functions, and undergirding principles and policies of student development and the related student personnel services and programs in contemporary colleges and universities including community colleges.

516-3 College Students and College Cultures. Study of the nature of students, the impact of the college on student development, and the nature of the college as a unique social institution. Study of student subcultures and the interaction between students, institutions, and communities.

517-3 The Legal Framework of Education. A study of administrative, judicial, statutory, and constitutional laws which have application in American public schools.

518-3 College Teaching. Emphasis is given to teaching and learning styles, the teaching-learning process, specific methods of teaching, strategies to improve teaching, resources available to the classroom teacher, and methods of evaluating teaching. Other topics will include: models of effective teaching behavior, academic freedom, and due process. Course also open to teaching assistants from other departments.

519-3 Illinois School Law. A study of administrative, judicial, statutory, and constitutional laws which have application in the Illinois public schools.

520-1 to 12 Current Issues in Educational Administration. An examination of current issues that affect the various administrative levels in educational systems. The issue selected receives intensive treatment and review.

521-3 School Facilities. A study of the basic techniques and methods of planning new facilities and evaluating existing facilities. Major emphasis is placed on the preparation of the facility master plan and educational specifications. Other related topics to be studied include site selection and development, furniture and equipment, maintenance and operation, pupil transportation, and the finance of capital outlay programs.

523-3 Supervision of Instruction. The function of the principal and supervisor in the improvement of instruction and in curriculum development. Activities, methods, and devices for improving the effectiveness of instruction stressed. Prerequisite: 511 or consent of instructor.

524-3 Curriculum Design and Policy. A study of assumptions, materials, methods, and evaluation in the designs of various curricula in colleges and universities, with attention to curriculum resources and policy.

525-3 School Finance Theory. A study of the principles and issues of public school finance. Basic theory, revenue systems, expenditures for public and non-public education, state foundation programs, federal aid programs, and local finance issues are studied in both the theory and contemporary settings. Specific emphasis is given to the Illinois public school financial support program in comparison to alternative formulas and methods as practiced in selected states.

526-3 The Community College. A study of the characteristics and functions of the community or junior college in American higher education. Course content aids the student in developing a general understanding of the philosophy, objectives, organization, and operations of this significant institution.

527-3 School Business Administration. A study of the principles and practices governing management of business affairs of a public school system. Included are such topics as revenues, expenditures, accounting, auditing, reporting, and applications of electronic data processing as a management tool. Practical experience is given in using the Illinois financial accounting manual as well as other managerial procedures. Detailed study is made of the role of the school business administrator in the local school district.

528-3 Finance in Higher Education. A study of financing higher education in American society and related economic aspects. Emphasis is given to sources of funds and management of financing in colleges and universities including budgeting, control, accountability, and current trends.

530-3 Historical Research in Education. Seminar designed to explore the literature, methods, and possibilities of historical research in education.

531-3 The School Superintendent and Board of Education. Focuses on superintendent-school board relationships. It investigates the administrative team's role and functions as they relate to leadership in educational policy making.

533-3 Elementary School Principalship. A critical study of research and writing with implications for the elementary principalship. Designed to meet many of the particular needs of persons interested in becoming elementary principals. Other persons such as teachers, superintendents, and staff personnel will gain insight into problems and responsibilities of the elementary principal's role.

535-1 to 14 (a–n-1 to 3 each, s-1 to 6) Higher Education Seminar I. A series of seminars for specialized study of areas of administrative practice and policy. **(a)** student personnel group work, **(b)** law and higher education, **(c)** student financial assistance, **(d)** admissions and records, **(e)** academic advisement, **(f)** academic and faculty administration, **(g)** current issues in student affairs, **(h)** housing, **(j)** non-traditional students/ non-traditional delivery, **(k)** women and higher

education, **(m)** student center, **(n)** supervisory management in higher education, and **(s)** selected topic.
with various types of adult programs and populations for administering adult curricula programs and staff, for using area and state social services, and for program funding are the primary emphases of this course. Prerequisite: admission to master's degree program.

537-3 The Adult Learner. The focus of study will be adult learners, their motivations, learning styles, needs, goals, life stages, life cycles, and developmental patterns. Implications for adult learning will be sought.

539-3 Evaluation and Accreditation in Schools. Developed to familiarize pre- and in-service teachers and administrators with the purpose, processes, roles, and instrumentation utilized by regional and state accreditation agencies. It is designed to prepare professional educators to implement both evaluator-evaluatee roles in the systematic process of accreditation and educational improvement at the local school level. It may be delivered on campus through simulated activities or on site in conjunction with real school evaluations. Prerequisite: consent of instructor.

540-3 Classics in Education. Primary attention will be given to Plato's *Republic,* Castiglione's *Courtier,* Rousseau's *Emile,* and Dewey's *Experience and Education.* Other authors such as Aristotle, Quintilian, Francis Bacon, Montaigne, John Bunyan, Benjamin Franklin, A. S. Neill, Karl Marx, and B. F. Skinner will receive additional consideration.

541-3 Personnel Evaluation. Directed toward the development of personnel evaluation systems for educational institutions. It will encompass both certificated and non-certificated personnel and examine a variety of methods/means approaches. The legal ramifications of evaluation and the use of evaluative data will be discussed in light of current federal and state laws and court decisions with respect to teacher tenure, due process, and other principles.

543-3 Professional Negotiations. An investigation of the theory and practice of professional negotiations. Emphasis will be placed on understanding the roles of adversarial negotiations. Use will be made of cases and simulations.

545-1 to 16 (a–g-1 to 3 each, h-1 to 8) Higher Education Seminar II. A series of seminars for scholarly inquiry into significant aspects of higher education. **(a)** Community college administration, **(b)** federal government and higher education, **(c)** institutional research, **(d)** current issues in higher education, **(e)** problems in central administration, **(f)** business and fiscal affairs, **(g)** history of higher education, **(h)** selected topic.

549-3 Naturalistic Research Methodology. An advanced seminar dealing with the foundations, design, application, and implementation of the naturalistic or qualitative method of conducting research. The student is expected to develop a dissertation prospectus or an original research report using the naturalistic method of inquiry. Prerequisite: doctoral standing or consent of instructor.

550-1 to 4 Higher Education Seminar III. An advanced seminar for doctoral students in higher

536-3 Organization and Administration of Adult and Continuing Education Programs. Review of methods and procedures for working education. Two hours required for all doctoral students. Prerequisite: doctoral students only.

551-3 Politics of Education. An examination of the political setting of educational administration selected leadership practices, and a general study of leadership theory. This course is open to students in approved sixth-year and doctoral programs only. In addition to educational leadership related to the politics of education, emphasis is given to innovative and contemporary practices of school administration.

552-3 Seminar in Comparative/International Education. The formulation of a conceptual framework necessary to engage in analytical studies of educational systems here and abroad. This frame of reference will enable the professional educator or social scientist to analyze educational provisions that foster or retard social progress and change.

553-3 Planning Processes and Policy Development. Surveys issues involved with accountability in education. Explores in some detail various planning models. Examines concepts and strategies in public policy development. Open to approved sixth year specialist and doctoral students.

554-3 Seminar in Philosophy of Education. An interpretation of modern educational problems and trends in the light of basic philosophical viewpoints. Excerpts from the leading philosophical writings are used. Prerequisite: 454 or consent of instructor.

555-3 Advanced Educational Administration Theory. An advanced seminar devoted to the study of classical and modern theories concerning the administration of complex organizations. Particular emphasis is placed on organizations as social units that pursue specific goals which they are structured to serve. The major areas of study are organizational goals, organizational structure, and organizations and their social environment. Prerequisite: 503 or equivalent.

559-3 Interdisciplinary Seminar in Educational Administration I. Seminar designed to assist specialist and doctoral students in understanding cognitive disciplines which relate directly to administrative competence. It is part of a two-part sequence which treats topics in political science, sociology, and communicative skills.

560-3 Education and Culture. A study of the concept of culture and its relation to the process of education.

561-3 Interdisciplinary Seminar in Educational Administration II. Seminar designed to assist specialist and doctoral students in understanding cognitive disciplines that relate to administrative competence. It covers areas in economics, anthropology, history, philosophy, etc.

565-3 Continuing Education and Extension Services. An in-depth examination of extension services and continuing education programs and delivery systems associated with post-secondary institutions, industrial and commercial organizations, professional associations, and governmental agencies will be made. Course emphasis is given to such learning programs as conferences, credit courses, non-credit courses, learning referral ser-

vices, non-traditional degree programs, and social service activities. Prerequisite: consent of instructor.

575-3 Seminar in Adult and Continuing Education. A content and research course focusing on selected topics in the area of adult and continuing education. Topics vary depending upon needs of students and competencies of staff. Prerequisite: consent of instructor.

588-3 to 6 General Graduate Seminar. Selected topics or problems in cultural foundations of education. Prerequisite: advanced standing and consent of instructor.

589-1 to 4 Higher Education Research Seminar. Limited to doctoral students formulating and preparing research designs for investigation and implementation. Graded *S/U* only. Prerequisite: consent of instructor.

590-1 to 6 Readings. Advanced reading in one of the following areas. **(a)** Administration, **(b)** buildings, **(c)** supervision of curriculum, **(d)** finance, **(e)** school law, **(f)** supervision, **(g)** comparative education, **(h)** history of education, **(i)** philosophy of education, **(j)** sociology of education, **(k)** adult and community education, **(l)** higher education. Prerequisite: consent of instructor. Graded *S/U* only.

591-1 to 6 Individual Study. Individual inquiry into selected problems or special topics in higher education under supervision of a graduate faculty member. Graded *S/U* only. Prerequisite: consent of instructor.

593-1 to 3 per topic Individual Research. Maximum of six hours toward master's degree. Selection, investigation, and writing of a research assignment under the personal supervision of a graduate faculty member in one of the following areas. **(a)** Administration, **(b)** buildings, **(c)** supervision of curriculum, **(d)** finance, **(e)** school law, **(f)** supervision, **(g)** comparative education, **(h)** history of education, **(i)** philosophy of education, **(j)** sociology of education, **(k)** adult and community education, **(l)** higher education. Prerequisite: consent of instructor. Graded *S/U* only.

595-1 to 8 Internships. Theory and practice in educational administration or higher education with a work experience in an educational setting.

596-1 to 6 Independent Investigation. Field study required of each student working for the sixth year specialist degree. Graded *S/U* only.

597-1 to 6 Superintendency Internship. An internship conducted in a central administrative setting for fulfillment of the state of Illinois' Level III Administrative Certificate. Consent of student's adviser is required.

599-1 to 6 Thesis.

600-1 to 36 (1 to 12 per semester) Dissertation. Minimum of 24 hours to be earned for the Doctor of Philosophy degree.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Educational Psychology

Courses in this department may require the purchase of supplemental materials. Field trips are required for certain courses.

402-3 Basic Statistics. A master's level terminal statistics course. Emphasis on descriptive statistics and graphical representation of data. Includes a brief introduction to hypothesis testing procedure.

412-3 Human Behavior and Mental Health. A study of the principles of human needs, mechanisms of adjustment, and factors and conditions in life that tend to affect mental health. Prerequisite: junior or senior standing.

418-3 Psychology of the Classroom. Intended to develop interpersonal skills such as values clarification, empathy, and listening. Strategies for the resolution of conflicts and reasons for students demonstrating disruptive behavior will be discussed. Role-playing, group processes, concepts and activities in behavior modification, and activities related to concepts of discipline will be examined. Content should be suited to parents, teachers, and other professionals.

422-3 Introduction to Individual and Group Assessment. The student will be introduced to the basic testing process and the problems related to individual group assessment and will be expected to choose a project for study and investigation. The project must be related in some way to the role and function of the counselor in different settings. The various types of assessment instruments and the manner in which the data derived therefrom can be employed in consultation.

442-3 Introduction to Counseling. The following topics will be covered: purposes of counseling; counselor roles in various settings; approaches to counseling; counseling activities; and application of the above.

481-1 to 12 Seminar. Conducted by staff members and distinguished guest lecturers on pertinent topics. Prerequisite: consent of instructor and department.

482-1 to 3 Seminar in Marriage and Family Counseling. Seminar will focus on current clinical and research topics in the field of marriage and family counseling and the general issues that emerge from the marriage and family counseling practicum. Prerequisite: 494a or b, 490, concurrent enrollment in 494E and permission of instructor.

490-3 Introduction to Marriage and Family Counseling. Problems and techniques of premarital, marital, divorce, family, and family crisis counseling. Counseling individuals singly, in family units, and in groups.

491-1 to 6 Special Research Problem—Individual Study. For majors. Formulating, investigating, and reporting on a problem in the area of applied psychology. Prerequisite: advanced standing and consent of department.

493-3 Counseling Skill Development. Through simulated counseling situations and extensive examination of counseling case studies, counseling skills are examined and practiced.

494A-3 School Counseling Practicum. A combined seminar, laboratory, and field experience representing the central focus of the program in school counseling. Enables the student to practice the role of the counselor under close supervision. Prerequisite: 537 and 3 additional hours from substantive course work in the counseling program.

494B-3 Counseling Practicum. Practice of counseling skills with different populations in varied settings. The professional setting depends on the student's interest area. Individual and group supervision are provided. Use of tape recorder is required. Prerequisite: 538 and 3 additional hours from substantive course work in the counseling program.

494C-3 Career Counseling Practicum. Supervised experience in handling career development experiences at elementary, secondary, or college levels. Application of theoretical models to program development is stressed, including presentation of relevant lessons, handling of group guidance activities, and conducting individual career development counseling sessions. Intern experience in public school or college settings equal to one day per week is required. Prerequisite: 542 and 3 additional hours from substantive course work in the guidance and counseling program.

494D-3 to 6 Practicum in School Psychology. Observation and participation in case conferences related to the development of psycho-educational assessment and planning, including teacher and parent consultation, field observations, and psychometric applications. Prerequisite: 533, 546 and consent of instructor.

494E-1 to 6 Practicum in Marriage and Family Counseling. Supervised on-campus counseling experience with couples and families. Supervision will be individual as well as within the context of a therapy team. Prerequisite: 493, 494a or b, 490, concurrent enrollment in 482 and consent of instructor.

506-4 Inferential Statistics. Covers basic descriptive techniques such as central tendency, measures of variability and graphical presentation of data. In addition, hypothesis testing, analysis of variance, nonparametrics, and simple linear prediction will be covered.

507-4 Multiple Regression. The general linear model is presented which allows for hypothesis testing including correlational analysis, analysis of variance, and analysis of covariance. Non-linear relationships are presented. Emphasis is placed on testing the stated research hypotheses. Prerequisite: 506.

508-4 Experimental Design in Educational Research. Strategies of designing research studies and the analysis of data from studies using linear models are examined. Emphasis will be placed on internal and external validity and factors that affect power in variance designs including completely randomized designs, Latin square, repeated measures, and analysis of covariance with each of the above designs. Prerequisite: 506 or equivalent.

511-3 Instructional Psychology. Critical review of empirical, methodological, and theoretical developments in the experimental study of instructional variables as related to student behavior. Prerequisite: None. PSYC 407 or equivalent is recommended.

512-3 Affective and Cognitive Behaviors at the School Level. Physical, mental, and social growth, affective and cognitive theories, moral and political development, acquisition and utility of language, motivation, and memory. The course is designed to enable a teacher to deal effectively with the affective and cognitive behaviors of school adults and children of differing abilities.

513-3 Psychological Trends in Education. Study of literature from B. F. Skinner, Carl Rogers, Erik Erickson, Abraham Maslow, John Dewey, Laurence Cremin, Jerome Bruner, Haim Ginott, Clark Moustakas, A. S. Neill, John Holt, Charles Silberman, Thomas Gordon, Jean Piaget, Jerome Kagan, Sigmund Freud, etc., to provide the student with knowledge of contemporary psychological trends in education.

515-3 The Psychological Aspects of Instructional Design. Survey of applications of psychology to the design, delivery, and evaluation of instruction for cognitive and effective learning among individuals of differing abilities, including the gifted. Prerequisite: 511.

521-3 Consultation in Schools and Organizational Systems. Surveys the theories and available research on several approaches to consultation with families, schools, and other organizational systems. Systemic approaches to consultation are emphasized.

525-3 Cross Cultural Factors Affecting Counseling. Designed to cover special problems of different cultural groups in the counseling process. The influence of culture upon values, beliefs, interests, and feelings will be explored as they relate to the rights of the client.

530-3 Standardized Testing: Use and Interpretation. Principles and procedures for determining appropriate instructional uses of tests and how to apply tests in the process of helping individual students. Emphasis will be on necessary principles of understanding standardized tests, interpretation of test results to students, teachers, and parents, and developing school testing programs. In addition, methods for appraising guidance programs will be covered. Prerequisite: 422.

531-3 Principles of Measurement. Intended to provide theoretical principles of measurement which are applicable to both teaching and research. Part of the course will be devoted to current issues in measurement and to practical applications to these theoretical principles. Prerequisite: 506.

532-3 Theories of Intelligence. Nature and assessment of intellectual behavior with emphasis on the historical, theoretical, and developmental aspects of intelligence. Special attention is given to test standardization and interpretation of the Stanford-Binet and Wechsler Scales.

533-4 Individual Measurement and Practice. Psycho-educational assessment of individual mental factors with attentions to all aspects of administration, scoring, interpreting, and utilizing the results of the Stanford-Binet Intelligence Scale, Wechsler Intelligence Scales for children and the Wechsler Adult Intelligence Scales. Additional charges not to exceed $22 may be assessed

for test kit rentals. Prerequisite: consent of instructor.

537-3 Counseling Children: Theory, Techniques, and Practice. The foundations and techniques of individual and group counseling with particular emphasis on theories, operational approaches, tools, and related procedures. Prerequisite: 493 or concurrent enrollment.

538-3 Adolescent and Adult Counseling: Theory, Techniques, and Practice. In this course, students will: understand the nature of counseling; be familiar with theoretical models of interpersonal relationships; develop effective communication skills; and be acquainted with strategies used to modify attitudes and behaviors. Prerequisite: 493 or concurrent enrollment.

540-3 Issues and Trends in Counseling. Students will examine current problems, issues, and trends with an emphasis on strategies for solving the problems; clarifying the issues and placing them in proper perspective; examining possible ramification of the trends.

542-3 Career Development Procedures and Practices. For pupil personnel workers, teachers, and administrators to give an orientation to theoretical, economic, and informational aspects of career guidance and to provide experience with using career information in counseling and decision making. Obtaining occupational and information materials for use in guidance and teaching.

543-3 Group Theory and Practice. Focuses on the theory, functions, and techniques of group procedures appropriately applied to decision making, problem solving, and resolution of conflict. Major emphasis is given to the dynamics of group behavior, the social-psychological interaction of small groups, and their applications to group counseling. Dual emphasis is placed upon interpersonal self-understanding and the familiarity with group procedures. Prerequisite: 493.

546-4 Personality Assessment. Assessment of individual interest patterns, motivations, and perceptual systems with attention to theories and assumptions of selected projective and objective diagnostic tests. Focuses on student related problems in elementary and secondary education. Additional charges not to exceed $22 may be assessed for test kit rentals.

547-3 Implementation of Counseling Services. Designed to furnish the prospective school counselor with knowledge and competency in planning and implementing a complete and integrated pupil personnel program for public schools. During the semester attention will be given to the parameters of such an integrated program, i.e., the function of a philosophical base; the principles which emerge from the philosophical position; the planning strategies best suited to implementing such a program; the actual recommendations for personnel, facilities, and materials; evaluation techniques and strategies; methods of reporting progress to students, school personnel, and the community, and an estimate of the per pupil cost. Prerequisite: experience in school counseling work, advanced standing in the counselor education program or equivalency to either of the above.

551-3 The Supervision of Practicum. Doctoral students will: become familiar with models of counseling supervision; practice supervision with master's students; and be acquainted with the research in the counselor training and supervision. Individual and group supervision are provided. Tape recording of supervision sessions is required.

555-3 to 6 (3,3) Seminar in School Psychology. Major professional issues and responsibilities; the school as a social system; ethical considerations; school related agencies and facilities; and professional organizations. Assists the student to prepare the project proposal required for the specialists' degree. Prerequisite: consent of instructor.

562-6 (3,3) Human Development in Education. Theories and research evidence regarding child development and behavior are investigated. These considerations focus upon implications for research and educational practices. **(a)** Childhood. **(b)** Adolescent.

567-2 to 9 (2 to 6 per semester) Topical Seminar in Educational Psychology. Contemporary topics and problems in the area of educational psychology. Conceptual and empirical activities. Prerequisite: consent of instructor.

568-1 to 12 (1 to 6 per semester) Topical Seminar in Counseling. Contemporary topics and problems in the area of counseling and guidance are covered. Conceptual experiential and empirical activities are stressed. Each course can be offered for one hour or more depending on current validity at the time offered. A student may also retake a course as the issues change in that area.

570-3 Humanistic and Behavioral Theories in Education. Doctoral students will critically examine major humanistic and behavioral systems; evaluate the research dealing with the systems; and be able to apply the systems to educational problems.

580 Doctoral Seminar in Educational Measurement and Statistics. A series of advanced seminars on statistics and measurement. Sections a through h may be taken only once each. Section i may be repeated as topics vary. **(a)**-3 Advanced regression analysis. **(b)**-3 Factor analysis. **(c)**-3 Multivariate methods. **(d)**-3 Nonparametric methods. **(e)**-2 Evaluation methods. **(f)**-3 Experimental design. **(g)**-3 Advanced measurement theory. **(h)**-3 Computer applications. **(i)**-2 to 6 per semester. Selected topics.

591-3 to 6 Internship in Counseling. Master and specialist level internship of 300 clock hours in counseling. The student will engage in a variety of services including individual, group, and consultation in an appropriate setting. Both on-campus and off-campus supervision is required. Prerequisite: 494a or b.

592-1 to 8 (1 to 6 per semester) Independent Study and Investigation. For advanced graduate students. Topics of interest to the individual student are studied under supervision of a department staff member. Prerequisite: consent of department.

593-1 to 4 Individual Research. For doctoral students in educational psychology. Formulating, investigating, and reporting of research problems in the area of guidance and educational psychology. Prerequisite: consent of department.

594-1 to 6 Advanced Practicum. Primarily for advanced master's or doctoral students who want to continue developing their counseling skills.

Counseling settings are individually arranged, however, they typically follow the 494 practicum experience.

595-1 to 8 Internship in the Psychology of Teaching. Full- or half-time teaching practice in the management of classroom behavior, and the design, delivery, and evaluation of instruction. Interns will be supervised by University staff. Graded *S/U* only. Prerequisite: consent of department.

596-15 (5 per semester) Internship in School Psychology. The purpose of the internship is to provide an opportunity to integrate the broad range of skills requisite to a position in school psychology. The internship provides the student with a full-year of full-time supervised experience in a pre-approved setting. Enrollment assumes completion of a master's degree in educational psychology or a related area and all course requirements for the specialist's degree in educational psychology. Graded *S/U* only.

597-12 (6,6) Doctoral Internship in Counseling. Doctoral or post-doctoral level students will be placed in an appropriate, full-time setting to engage in a variety of counseling services. On-campus and off-campus supervision will be provided by doctorate level counselors. Prerequisite: 591 and 594.

599-1 to 6 Thesis. Prerequisite: consent of department.

600-1 to 32 (1 to 16 per semester) Dissertation.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Electrical Engineering

(See Engineering.)

Engineering

455-3 Engineering Geology. (See Geology 455.)

501-3 Advanced Engineering Analysis I. Series solution of ordinary differential equations, special functions of engineering analysis, vector analysis, partial differential equations of engineering analysis, the calculus of variations. Prerequisite: MATH 305, 450, or consent of instructor.

502-3 Advanced Engineering Analysis II. Origins of eigenvalue problems, operators on inner product spaces, spectral theorem with applications, Fourier series, two-point boundary value problems, special functions of engineering analysis, calculus of Fouriem transforms with applications, generalized functions, discrete transforms, other related transforms. Prerequisite: 501 or consent of instructor.

520-3 Systems Theory. Analysis of continuous and discrete systems, equations of state for systems, z-transform analysis, concepts of stability, controllability, and observability. Prerequisite: MATH 450, or equivalent.

530-3 Engineering Data-Acquisition: Theory and Practice. Theory of data-acquisition and measurement systems. Methods of measurement of electrical, mechanical, fluidic, and thermal properties. Criteria for selection of instruments and components of management systems.

540-3 Design of Engineering Experiments. Planning of experiments for laboratory and field studies, similitude and modeling, statistical design of experiments, data analysis, generalization of research findings. Prerequisite: MATH 450, 483, or consent of instructor.

545-3 Advanced Numerical Methods in Engineering. Engineering applications of linear and nonlinear equations, unconstrained optimization, linear and nonlinear programming, numerical solutions of ordinary and partial differential equations, eigenvalue problems. Prerequisite: MATH 305 and consent of instructor.

550-3 to 9 (Maximum of 3 per topic) Advanced Topics in Mechanics. Topics will be offered in fluid mechanics, solid mechanics, structures, or materials. Advanced topics in fluid mechanics include: **(a)** turbulence modeling, **(b)** fluid transients, **(c)** flow through porous media, and **(d)** rheology. Advanced topics in solid mechanics include: **(e)** theory and analysis of shells, **(f)** theory of elasticity, **(g)** viscoelasticity. Advanced topics in structure include: **(h)** structural dynamics, **(i)** nonlinear structural analysis. Advanced topics in materials include: **(j)** fracture mechanics and dislocation theory **(k)** advanced rock mechanics, and **(l)** numerical methods in geomechanics. Prerequisite: consent of instructor.

551-3 to 9 (Maximum of 3 per topic) Advanced Topics in Fossil Energy. Studies of fossil energy extraction and conversion process with emphasis on scientific principles, analytical methods, and recent technological developments. Topics include: **(a)** physical coal processing, **(b)** fine coal beneficiation, **(c)** coal chemistry and characterization, **(d)** environmental issues of air and hazardous waste, **(e)** advanced mining systems, **(f)** network theory in mine ventilation, **(g)** operations research applications to mining, **(h)** solid carbon and coal derived materials. Prerequisite: consent of instructor.

580-1 to 2 Seminar. Study and oral presentation of selected problems in advanced engineering and science. Graded *S/U* only. Prerequisite: enrollment in the Ph.D. in engineering science program and consent of instructor.

590-1 to 6 (Maximum of 3 per semester) Special Investigations in Engineering Science. Investigation of individual advanced projects and problems selected by student or instructor. Prerequisite: admission into Ph.D. program in engineering science.

600-1 to 36 (1 to 16 per semester) Doctoral Dissertation. Dissertation research. Hours and credit to be arranged by director of graduate studies. Graded *S/U* only. Prerequisite: admission to Ph.D. in engineering science program.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Civil Engineering and Mechanics

Graduate work in the Department of Civil Engineering and Mechanics is offered toward a concentration for the Master of Science degree in engineering. Safety glasses are required for some of the courses in this department. Four-hundred level courses in this department may be taken for graduate credit unless otherwise indicated in the course description.

Civil Engineering

409-3 Hydrology and Hydraulic Engineering Design. Study of the hydrologic cycle. Streamflow analysis. Unit hydrograph. Matrix methods; synthetic methods. Frequency analysis; multivariate distributions. Hydrologic and hydraulic routings. Groundwater hydrology. Application of hydrology to the design of various hydraulic structures: small dams, spillways, drainage systems. Prerequisite: Engineering 222, 313 or equivalent or consent of instructor.

410-3 Hazardous-Waste Engineering and Management. Analysis of hazardous waste generation, storage, shipping, and disposal. Design of disposal systems. Relating hazardous-waste disposal techniques and management with governmental regulations. Prerequisite: 314, Engineering 300.

413-3 Fluid Systems Design. Two to three week projects involving the identification, modeling, analysis, and design of fluid-engineering systems. Prerequisite: Engineering 222, 313.

414-3 Intermediate Fluid Mechanics. A development of the governing equations of motion including the continuity, Navier-Stokes, and energy equations. Application of these equations to potential, viscous, and compressible flows. Isentropic flow of a perfect gas. Normal and oblique shock waves, Prandtl-Meyer flow. Prerequisite: Engineering 313 or equivalent.

417-1 Water Quality Laboratory. Measurements of water quality parameters performed. Use of modern instrumental techniques demonstrated. Safety glasses are required. Laboratory supply fee $15. Prerequisite: 314.

419-3 Water Supply and Treatment. Water quality requirements, water sources, water treatment to include coagulation and flocculation, mixing and sedimentation basins, filtration, disinfection processes, and water softening. Consideration of toxic elements in water (sources, problems, and treatments). Prerequisite: 314 and Engineering 313.

421-3 Foundation Design. Application of soil mechanics to the design of the foundations of structures; bearing capacity and settlement analysis; design of shallow footings; stability of earth slopes; design of retaining walls, design of pile foundations, coffer dams. Prerequisite: 321.

427-3 Physical and Chemical Treatment in Environmental Engineering. Physical and chemical treatment as applied to water and wastewater. Topics include coagulation, flocculation, sedimentation, adsorption, ion exchange, and oxidation in dilute aqueous systems. Design of systems. Laboratory. Prerequisite: 314, 415.

431-3 Pavement Design. Design of highway and airport systems: subgrades, subbases, and bases; soil stabilization; stresses in pavements; design of flexible and rigid pavements; cost analysis and pavement selection; and pavement evaluation and rehabilitation. Prerequisite: 312 and 321.

440-3 Statically Indeterminate Structures. Analysis of trusses, beams, and frames. Approximate methods. Method of consistent deformations. Three-moment theorem. Slope deflection. Moment distribution. Column analogy. Plastic analysis. Matrix methods. Prerequisite: 340.

441-3 Intermediate Vibrations and Design. Theory: Review of second order ordinary linear differential equations. Matrices and determinants. Phasor and trigonometric solutions, Duhamel integrals, Fourier Series. Applications: equipment mounts, deflection of rotating shafts, resonance, vibration absorbers, vibrometer and accelerometer design, analysis of accelerometer and vibrometer data, seismic design loads on buildings, vibration linkages. Prerequisite: Engineering 222, 260b, 311 and Mathematics 305.

442-3 Structural Steel Design. An introduction to structural steel design with emphasis on buildings. Composite design. Plate girders. Rigid frames. Design project and report required. Prerequisite: 340.

444-3 Reinforced Concrete Design. Behavior and strength design of reinforced concrete beams, slabs, compression members, and footings. Prerequisite: 340.

445-3 Reinforced Masonry Design. Materials. Loads. Walls. Columns and pilasters. Beams. Lateral-load resisting elements. Connections and joints. High-rise structures. Environmental features. Quality control. Design project and report required. Prerequisite: 444.

446-3 Prestressed Concrete Design. Fundamental concepts of analysis and design. Materials. Flexure, shear, and torsions. Deflections. Prestress losses. Composite beams. Indeterminate structures. Slabs. Bridges. Prerequisite: 444.

447-3 Intermediate Mechanics of Materials. Torsion of noncircular shafts. Unsymmetric bending problems. The shear center. Yield theories and plastic material behavior. Fatigue and brittle fracture. Energy methods in solid mechanics. Design of members to resist yielding and fracture. Prerequisite: Engineering 222 and 311.

448-3 Experimental Stress Analysis. Development of theoretical equations of stress and strain and their transformations. Equations of equilibrium; compatibility equations; stress functions; applications of these equations in stress measurements; study of optical, mechanical, and electrical strain gauges; brittle coating; Moire' technique; and two-dimensional photoelasticity.

Laboratory supply fee $10. Prerequisite: Engineering 311.

449-3 Intermediate Dynamics. Kinematics and kinetics of plane and three-dimensional motion. Principles of work and energy applied to the motion of rigid bodies. Principle of impulse-momentum applied to variable mass and rigid body systems. Space mechanics. Prerequisite: Engineering 222, 260, Mathematics 305.

451-3 Introduction to Finite Elements in Engineering Applications. (Same as Engineering Mechanics 451.) Introduction to finite element techniques and computer methods in finite element applications. Theory and structure of algorithms for one-dimensional and multi-dimensional problems. Introduction to boundary element methods. Applications in solid mechanics, structural analysis, groundwater flow, and heat transfer. Prerequisite: Engineering Mechanics 351 or equivalent.

458-3 Photoelasticity. Optics related to photoelasticity; theory of photoelasticity; photoelastic materials; analysis techniques; two-dimensional and three-dimensional photoelasticity; birefringent coatings; scattered light photoelasticity; application of photoelastic methods. Laboratory. Prerequisite: Engineering 311.

462-3 Matrix Methods of Structural Analysis. Flexibility method and stiffness method applied to framed structures. Introduction to finite elements. Prerequisite: 340 and Engineering 222.

470-3 Engineering Analysis. Methods of solution for basic ordinary differential equations with applications to engineering systems. Basic methods of solution for partial differential equations with emphasis on applications of the Laplace, Poisson, and heat equations to engineering problems. Basic vector field theory; transformation theorems. Simulation techniques applied to engineering systems. Prerequisite: Mathematics 305 or equivalent.

510-3 Hazardous Waste Engineering. Analysis of hazardous waste generation, storage, shipping, treatment, and disposal. Source reduction methods. Government regulations. Remedial action. Prerequisites: 427 and ENGR 300.

512-3 Theory of Elasticity. (Same as Engineering Mechanics 512.) Stress and strain and equations of elasticity, equilibrium equations; compatibility equations; stress functions; applications of elasticity in solving engineering problems in two- and three-dimensions. Prerequisite: MATH 305 or consent of instructor.

513-3 Theory of Plasticity. Yield criteria, kinematic and isotropic strain hardening; flow rules for plastic strain, elastic-plastic bending and torsion; slipline field theory; plane strain problems; residual stresses and limit analysis. Prerequisite: ENGR 311 and MATH 305.

515-3 Transient Hydraulic Transport. (Same as Engineering Mechanics 515.) Unsteady motions in single and multiphase, incompressible, and compressible flow in pipes and incompressible flow in open channel systems. Numerical analysis and control of waterhammer, density waves, and system resonance. Method of characteristics and implicit methods. Wave structure interaction. Free surface transients, the kinematic wave. Prerequisite: EM 414 or consent of instructor.

516-3 Water Resources Management. Water quality factors and control methods. Technical, economic, social, and legal aspects concerned with implementation of various engineered systems for water quality management. Case studies. Prerequisite: 415.

517-3 Industrial Waste Treatment. Theories and methods of treating industrial wastes. Case studies of major industrial waste problems and their solutions. Prerequisite: 415.

518-3 Advanced Biological Treatment Processes. The biochemical and microbial aspects of converting substrate to bacterial cell mass or products and its use in various phases of industry (both fermentation and wastewater treatment). Design of activated sludge and trickling filter plants from lab data obtained on explicit wastes from both industry and municipalities. Prerequisite: 415.

521-3 Aqueous System Analysis. Applied environmental chemistry as it relates to water and wastewater treatment systems. Topics include acid-base chemistry, pC-pH diagrams, coordination chemistry, precipitation, dissolution, and computer solutions. Prerequisite: 314, 415, 417, or consent of instructor.

522-3 Unit Operations in Environmental Engineering. Physical and chemical processes as applied to water and wastewater treatment. Topics include coagulation, flocculation, sedimentation, adsorption, ion exchange, and oxidation in dilute aqueous systems. Prerequisite: 314, 415, or consent of instructor.

531-3 Advanced Soil Mechanics I. Problems in geotechnical engineering, stresses in soil mass in two and three dimensions, effective stress principle, consolidation, consolidation with vertical and radial drainage, shear strength, stress path. Prerequisite: 321 and 421.

532-3 Advanced Soil Mechanics II. Advanced problems in geotechnical engineering, seepage, dewatering systems, stability analysis of slopes, frozen ground engineering. Prerequisite: 531.

541-3 Advanced Foundation Engineering. Objectives of foundation engineering, case histories, design criteria, shallow foundations, deep foundations, piles under lateral loads, uplift loads, and soil anchors. Prerequisite: 531 or consent of instructor.

544-3 Advanced Design of Reinforced Concrete. Deep beams, shear friction. Slab, beam, girder systems. Monolithic joints. Retaining walls. Deflections. Length effects on columns. Two-way floor systems. Yield line theory. Torsion. Seismic design. Prerequisite: 444.

545-3 Advanced Steel Design. Economical use of high strength steel; behavior and design bolted and welded building connections, plate girders and composite steel-concrete beams; brittle fracture and fatigue; and low-rise and industrial-type buildings. Prerequisite: 442.

551-3 Soil Dynamics. Earthquake induced damage to soil and soil structures, problems due to dynamic loading of soils, wave propagation, dynamic soil properties and their determination, liquefaction of soils, design of foundation in seismic areas. Prerequisite: 441 and 531.

556-3 Theory of Laminate Composite Structures. Orthotropic and Anisotropic Materials, Laminated Plate Theory, Ritz Method, Galerkin's

Method, bending, buckling, and vibration of Laminated structures. Prerequisite: ENGR 311 and MATH 215.

561-3 Structural Dynamics. (Same as Engineering Mechanics 561.) Analysis of the dynamic response of multidegree-of-freedom framed structures. Structural idealizations. Matrix formulation. Lagrange's equations. Response calculation by modesuperposition and direct integration methods. Analysis for earthquakes. Prerequisite: 340, EM 441, or consent of instructor.

562-3 Nonlinear Structural Analysis. Analysis of the nonlinear response of framed structures subjected to static and dynamic loads. Structural idealizations. Response calculation by incremental and iterative techniques. Instability phenomena of snap-through and bifuraction. Post-buckling behavior. Approximate formulations. Detection of instability under dynamic loads. Prerequisite: 462 or EM 520 or consent of instructor.

580-1 to 4 Seminar. Collective and individual study of selected issues and problems relating to various engineering areas. Registration for 1 hour credit, *S* or *U* grade will be used. Registration for more than 1 hour credit, letter grades will be used. Prerequisite: graduate standing.

592-1 to 5 Special Investigations in Engineering. Advanced engineering topics and/or problems in **(a)** structural engineering, **(b)** hydraulic engineering, **(c)** environmental engineering, and **(d)** applied mechanics. Prerequisite: graduate standing and consent of instructor.

599-1 to 6 Thesis.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S*/*U* or *DEF* only.

Engineering Mechanics

The following courses are offered by the Department of Civil Engineering and Mechanics.

510-3 Computational Fluid Dynamics. Advanced topics in the computer solution of complex 2-D and 3-D fluid flows. Consideration of various finite difference formulations in different coordinate systems. Upwind differencing, stability analysis, explicit methods, implicit methods, boundary condition formulation. Introduction to finite element approach. Prerequisite: 414 and 451 or consent of instructor.

512-3 Theory of Elasticity. (Same as Civil Engineering 512.) Stress and strain and equations of elasticity; equilibrium equations; compatibility equations; stress functions; application of elasticity in solving engineering problem in two- and three-dimensions. Prerequisite: MATH 305 or consent of instructor.

513-3 Mechanics of Viscous Fluids. Theory of laminar viscous flows using the continuum approach. The stress and rate-of-deformation tensors; exact solutions including slow motion and problems of the laminar boundary type. Introduction to hydrodynamic stability. Prerequisite: 414 or consent of instructor.

514-3 Mechanics of Inviscid Fluids. A study of stream functions, the velocity potential, Euler equations, Bernoulli equations, various solutions to Laplace's equation, added masses, Taylor theorem, Blasius and Legally theorems, two-dimensional irrotational flows, Cauchy-Riemann equations, conformal mapping, vortex flow, thin airfoil theory, and freestreamline flows. Prerequisite: 414 or consent of instructor.

515-3 Transient Hydraulic Transport. (Same as Civil Engineering 515.) Unsteady motions in single and multiphase, incompressible, and compressible flow in pipes and incompressible flow in open channel systems. Numerical analysis and control of waterhammer, density waves, and system resonance. Method of characteristics and implicit methods. Wave structure interaction. Free surface transients, the kinematic wave. Prerequisite: 414 or consent of instructor.

518-3 Introduction to Turbulence. Application of the basic equations of motion to turbulent flow problems. Reynolds equations; turbulence energy equations; description of the structure of turbulence; correlation and spectrum functions, macro, micro, and time scales; phenomenological theories; free shear and wall shear flows. Hot-wire anemometry; Laser Doppler anemometry. Prerequisite: 414 or equivalent or consent of instructor.

520-3 Finite Element Analysis. Theoretical basis for finite elements in engineering mechanics. Derivation of element equations by displacement and variational methods for use in the solution of two- and three-dimensional stress problems; plate bending and shell problems; introduction to dynamic and nonlinear analysis, applications to fluid mechanics. Prerequisite: 462 or consent of instructor.

540-2 Elastic Stability. Bending of beam columns under simultaneous action of axial and lateral loads; buckling of compressed bars, frames, rings, and arches; lateral buckling of beams; torsion of I beams; buckling of thin plates. Prerequisite: MATH 305 or 407 or consent of instructor.

542-2 Theory of Plates. Analysis of bending and vibration of plates of various shapes; energy method; complex variables methods, linear and non-linear behavior; theory of bending of anisotropic and non-homogeneous plates. Prerequisite: MATH 305 or 407 or consent of instructor.

550-3 Advanced Compressible Fluid Flow. Multidimensional compressible flow. Linearized equations of motion. Method of characteristics. Rarified gas dynamics. Hypersonic flow. Transonic flow. Prerequisite: 414 or equivalent.

561-3 Structural Dynamics. (Same as Civil Engineering 561.) Analysis of the dynamic response of multidegree-of-freedom framed structures. Structural idealization. Matrix formulation. Lagrange's equations. Response calculation by mode-superposition and direct integration methods. Analysis for earthquakes. Prerequisite: 441, CE 340, or consent of instructor.

580-1 to 4 Seminar. Collective and individual study of selected issues and problems relating to various engineering areas. Registration for 1 hour credit, *S* or *U* grade will be used. Registration for

more than 1 hour credit, letter grades will be used. Prerequisite: graduate standing.

592-1 to 4 Special Investigations in Engineering. Advanced engineering topics and problems in **(a)** stress analysis, **(b)** fluid flow analysis, **(c)** structural engineering, **(d)** computational mechanics, **(e)** materials engineering, and **(f)** dynamics. Prerequisite: graduate standing and consent of instructor.

599-1 to 6 Thesis.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Electrical Engineering

Graduate work in the Department of Electrical Engineering is offered toward a concentration for the Master of Science degree in engineering. Safety glasses are required for some of the courses in this department. Four-hundred-level courses in this department may be taken for graduate credit unless otherwise indicated in the course description.

421-2 Digital Computers in Applied Physical Research. Computational techniques for matrix inversion, solution of linear equations, and characteristic roots and vectors. Least squares analysis, curve-fitting, and regression. Numerical quadrature. Solution of non-linear equations. Solution of regular differential equations and boundary-value problems. Generation of approximate solutions. Monte Carlo techniques. Engineering and other physical examples are used as the primary teaching vehicle. Prerequisite: Engineering 222 and Mathematics 305.

424-3 Design of Microprocessor-Based Systems. Microprocessor terminology. Design, construction, and programming of microprocessor-based systems complete with newest technology. Lecture and laboratory. Cost of parts for microprocessor-based system, approximately $80. Prerequisite: 427, 426 or concurrent enrollment, or consent of instructor.

426-4 Microcomputer Systems. Composition and applications of microcomputer systems. Microprocessor programming relative to interfacing devices such as input/output ports, analog-to-digital converters, and digital-to-analog converters. Lecture and laboratory. Prerequisite: 225 and 345, Engineering 222 or consent of instructor.

427-3 Structure of Digital Computers. Introduction to structure and design of digital computers, central processing unit, arithmetic unit, memory organization including cache and virtual memory concepts, input and output systems, interrupts and Direct Memory Access, hardwired and microprogrammed control units. Future trends in computers. Prerequisite: 327.

428-3 Digital Hardware Design I. Fundamentals of digital hardware design. Systems with microcomputer as controller. Microcomputer buses and interfaces. Lecture and laboratory. Laboratory fee of $10 to help defray cost of consumable items. Prerequisite: 465, 426 or 427 or consent of instructor.

443-4 Electrical Engineering Design. Students select suitable project, define and design subsystems, define requirements of interfaces among subsystems, integrate subsystems into final design, and document, price, and schedule project. Lecture and laboratory. Prerequisite: senior standing in electrical engineering.

446-4 Electronic Circuit Design. Design techniques for a wide range of electronic circuits. Device and circuit modeling. Computer aided circuit design. Consideration of audio, video, and tuned amplifiers; feedback; oscillators; digital circuits. Design project. Lecture and laboratory. Laboratory fee of $10 to help defray cost of consumable items. Prerequisite: 355 or concurrent enrollment; 345.

447-4 Electronic Devices. Physical mechanisms governing the operation of a wide variety of semiconductor devices. Applications of specific devices are used to illustrate performance characteristics and the relation between device design parameters and terminal properties. Lecture and laboratory. Prerequisite: 345, Engineering 222.

448-4 Laser Electronics. A study of the excitation and lasing process in various liquid, solid, and gas lasers. Techniques and principles utilized in the design of a laser system are also covered. Lecture and Laboratory. Prerequisite: 345.

456-3 Control Theory. Fundamentals and techniques for analysis and design of systems with feedback. Signal flow graphs. S-plane analysis. Frequency-domain analysis. Root locus. Stability conditions. Compensation techniques. Prerequisite: 355.

458-3 Communications Theory. Basic information theory. Fourier series and transform. Sampling theory. Amplitude modulation, frequency modulation, and pulse modulation. Signal-to-noise ratio. Prerequisite: 355.

459-3 Digital Control. Analysis and design of discrete-data and digital control systems using tools like Z-transforms, state variable equations, stability criteria time-domain response, and frequency-domain response. Prerequisite: 225 and 355.

462-3 Biomedical Instrumentation. (Same as Physiology 462.) Diagnostic and therapeutic modalities related to engineering. Cardiovascular, neural, sensory and respiratory instrumentation. Prerequisite: consent of instructor.

465-3 Instrumentation. Measurement systems for research and manufacturing. Instrument characteristics. Digital and analog techniques and devices in instrumentation. Transducers. Signal conditioners. Displays. Control devices. Statistics of measurement. Lecture and laboratory. Laboratory fee of $10 to help defray cost of consumable items. Prerequisite: 345.

468-3 Digital Signal Processing. Discrete Z-transforms. Discrete Fourier Transform. Fast Fourier Transform algorithms. Digital filter design. Applications in speech and image processing. Prerequisite: 355.

477-3 Electromagnetic Waves. Transmission line analysis, phasor diagram and Smith chart,

general eigen-wave analysis, guided wave properties, plane waves including optical waves, oblique reflection and transmission, and non-reciprocal wave systems. Lecture and Design laboratory. Prerequisite: 375 or consent of the instructor.

478-3 Digital Communication. Application of probability theory and random processes in digital communication systems. Behavior of digital communication systems in noise. Performance comparisons of digital modulation systems. Optimum signal detection. Entropy and channel coding. Prerequisite: 355.

479-3 Electromagnetic and Optical Measurements. Fundamental measurement techniques in electromagnetic wave systems and optical systems. Accurate measurements of microwave properties of materials, laser transmission reception, modulations, and holographs. One hour lecture and six hours laboratory per week. Prerequisite: 477 or consent of instructor.

483-3 Power Electronics. Power semiconductor devices. Power converters, reactive power control devices. Application of power electronics to control of electrical machines. Prerequisite: 345, 385.

484-3 Computer Aided Circuit Design. Network Topology. Nodal linear network analysis. Nodal non-linear network analysis. Standard form state equations of linear networks. Numerical solution of state equations. Sensitivity calculations. Prerequisite: 336.

486-3 Electric Energy Sources. Principles and utilization of nuclear, solar, and fossil-fuel generators. Direct energy converters. Energy storage devices. Cost of generating power. Prerequisite: 385 or consent of instructor.

487-4 Power Systems Analysis. Introduction to analysis of electric power systems. Modeling of power system components. Power system configuration. Per-unit quantities. Network analysis applied to power systems. Load flow. Lecture and laboratory. Prerequisite: 385.

488-3 Power Systems Engineering. Economic operation of power systems; symmetrical components; short circuit analysis; stability. Prerequisite: 487.

489-3 Electric Power Distribution. Electric power distribution requirements and their accomplishment, including determination of load characteristics, design of primary and secondary distribution networks, metering, voltage regulation, and protection. Prerequisite: 487.

492-1 to 3 Special Studies in Electrical Engineering. Individual projects and problems selected by student or instructor. Open to seniors only. Prerequisite: consent of instructor.

493-1 to 3 Special Topics in Electrical Engineering. Lectures on topics of special interest to students in various areas of electrical engineering. Designed to offer and test new and experimental courses in electrical engineering. Prerequisite: consent of instructor.

521-3 Fault-Tolerant Computer Design. Concepts of error detection, location, and correction in digital systems. Codes for error detection and correction. Models and simulations of faults. Design of tests for combinatorial and sequential circuits. Testability. Design of digital systems with testability. Prerequisite: 427.

527-3 Switching Circuit Theory. Study of both combinational and sequential switching circuits with emphasis on sequential networks. Threshold logic. Fault detection and location in combinational circuits. Finite-state machines including: minimization, state assignment, races, state-identification. Asynchronous sequential circuits. Linear sequential machines. Prerequisite: 427.

528-3 Advanced Computer Design. Problems in analyzing and designing advanced architectures of advanced computers. Single-instruction, multiple data; multiple-instruction, multiple data machines. Overlap, pipeline, parallel, and associative processing. Design of hardware for advanced input/output systems and interconnections among processors and memories. Memory organizations. Methods for evaluating performance of advanced computers. Prerequisite: 427.

529-3 Analog-to-Digital Conversion and Related Devices. Principles, analysis and design of analog-to-digital converters, video converters, voltage-to-frequency (V/F) and frequency-to-voltage (F/V) converters; universal synchronous/asynchronous receiver/transmitter circuits; hardware implementation of: Fourier analysis, infinite/finite impulse response (IIR/FIR) filters; microcoded systems, fixed and floating point accumulators. Two projects. Prerequisite: 428 and 465 or consent of instructor.

536-3 Network Synthesis. Introduction to modern network synthesis. Driving point and transfer functions. Positive real functions, Foster networks, and Cauer networks. Active network elements. Synthesis using active elements. Prerequisite: 445 or consent of instructor.

542-3 Optical Information Processing. Fraunhofer and Fresnel diffraction, the reciprocity theorem, Kirchoff's integral. General aspects of mutual coherence. Basic properties of recording materials. Phase transformation of thin lenses, Fourier transform properties of lenses, coherent optical information processing systems and applications. Introduction to holography and its applications. Prerequisite: 355.

544-3 Radiation Effects in Semiconductor Materials and Devices. A study of the effects of energetic photon, electron, and heavy particle bombardment effects on the properties of semiconductor materials and devices. Theory of material and device properties and operation. Theory of the interaction of radiation with matter. Acquisition and interpretation of experimental data. Prerequisite: consent of instructor.

545-3 Advanced Semiconductor Devices. Physical principles and operational characterisitics of solid-state devices. p-n junction devices, Interface and thin-film devices, optoelectronic devices, and bulk-effect devices. Fabrication and circuit model of devices. Prerequisite: 447 or consent of instructor.

546-3 Gaseous Electronics. Basic science of gas discharges and plasmas. Electrode phenomenon and plasma oscillations. Application of gas discharges to dry etching, plasma-assisted chemical vapor deposition, and sputtering. Prerequisite: consent of instructor.

547-3 Solid-State Theory of Electronic Materials. Electronic properties of materials and their application to practical devices. Quantum and statistical mechanics. Semiconductor principles and devices. Thermo-electric phenomena. Mag-

netic materials. Quantum electronics and lasers. Prerequisite: consent of instructor.

548-3 Advanced Electronic Devices. A study of techniques in fabricating microelectronic and discrete electronic devices and influences on device design. Thick-film hybrid, thin-film hybrid, monolithic bipolar, and monolithic MOS technologies will be examined. Prerequisite: 447 and ENGR 345.

549-3 Fiber Optics Communication. Fundamentals of step index and graded index fiber waveguides using geometrical optics and Maxwell's equations. Other topics include design criteria, practical coupling techniques, discussion of optical sources and detectors used in light-wave communications, system examples, characterization and measurement techniques. Prerequisite: 455 and 447 or 448; or consent of instructor.

551-3 Probability and Random Processes. Axioms of probability, random variables and vectors, joint distributions, correlation, conditional statistics, sequences of random variables, stochastic convergence, central limit theorem, stochastic processes, stationarity, ergodicity, spectral analysis, mean square estimation, prediction, filtering. Prerequisite: 478 or MATH 483 or consent of instructor.

552-3 Detection Theory. Signal detection in white and colored noise. Random waveforms. Matched filtering. M-ary signal detection, nonparametric detection, sequential hypothesis testing, decision theoretic schemes. Applications in communication and radar signal processing. Prerequisite: 551 or consent of instructor.

553-3 Data Communications Network. Layering. Data link control. Capacity assignment. Time delay. Queueing theory. Routing and flow control. Multiple-access networks. Collision-resolution algorithms. ISDN and metropolitan area networks. Mobile radio. Prerequisite: 551, or equivalent course in probability theory and consent of instructor.

554-3 Spread Spectrum Communication. Concepts of spread spectrum systems, frequency hopping, and direct sequence systems. Anti-jamming performance analysis, synchronization schemes, and systems with forward error correction. Prerequisite: 552 or consent of instructor.

555-3 Information Theory. Introduce the foundations of information theory as related to data compression and transmission of information. Contents: Entropy, block encoding, Huffman code, universal code, capacity, channel coding, Ergodic Theorem, Shannon-McMillan Theorem, rate-distoration theory, quantization, predictive coding, multiterminal information networks. Prerequisite: 551 or MATH 480 or consent of instructor.

557-6 (3,3) Complex Systems. Theory, techniques, and philosophy of analyzing and designing complex engineering systems. Methods which maintain generality in dealing with complex combinations of diverse subsystems such as electrical, mechanical, chemical, transport, and biological. Prerequisite: 457 or consent of instructor.

558-3 Digital Image Processing. Basic concepts and techniques for digital image processing. Topics include image fundamentals and representation, image transforms, enhancement, restoration, segmentation, description, and classification. Prerequisite: 355 and 468.

559-3 Robust Methods in Communication. Introduce qualitative and quantitative robustness and several robust methods from the areas: estimation theory, detection theory and information theory. Topics: Robustness via continuity, Prohorov metric, breakdown point, influence function, minimax games, robust: parameter estimation, Kalman filter, prediction, hypothesis testing, matched filter, source and channel coding, quantization. Prerequisite: consent of instructor.

562-3 Advanced Biomedical Instrumentation. Scientific and mathematic analysis of instrumentation in diagnostics, therapeutics, and medical research. Purposes of instrumentation related to physiology and pathology. Prerequisite: 462 and 465.

563-3 Estimation Theory and Filtering. Parameter estimation for deterministic systems: least-squares, projection and persistent excitation methods. State and parameter estimation of stochastic systems. Bayesian estimation theory, maximum likelihood and maximum a-posteriori estimation. Optimal filtering. The Kalman recursive filter. Nonlinear estimation. Estimation bounds. Applications to communications and control. Prerequisite: 551 or consent of instructor.

564-3 Optimal Control. Optimization techniques for linear and nonlinear systems. Variational calculus. Dynamic programming. Pontryagin's maximum principle. Hamilton-Jacobi theory. Linear regulator. Bang Bang control, minimum time control, singular control. Discrete variational calculus. Combined estimation and control. Computational methods in optimal control. Prerequisite: 456 or consent of instructor.

565-3 Nonlinear Systems Analysis. Nonlinear systems, autonomous systems. Analytical approximation methods. Nonlinear differential equations. Stability of time-varying and nonlinear systems. Liapunov's method, input-output stability. Nonlinear discrete systems. Prerequisite: 456 or consent of instructor.

566-3 Adaptive Control. Adaptive systems and adaptation mechanisms. Error system models, direct and indirect adaptive control methods, self-tuning control, model reference adaptive control, variable structure adaptive control, robust control, learning control. Design techniques and applications. Prerequisite: 456 or consent of instructor.

572-3 Neural Networks. Anatomy and physiology of the cerebral cortex. Feed-forward Networks, Linear Associator, Multilayer Perceptrons. Feedback Networks, Hopfield Networks, ART. Applications to pattern recognition, robotics and speech processing. Optical and electronic implementations. Prerequisite: MATH 305 or consent of instructor.

573-3 Field Analysis of Guided Waves. Techniques of boundary value problems, general theories of guided waves, closed wave guides of arbitrary cross sections, open wave guides, Goubau lines and optical wave guides, Green functions applied to wave guide analysis. Prerequisite: 375 or consent of instructor.

574-3 Nonlinear Optics. Coupled-mode-analysis applied to nonlinear wave interactions, harmonic generation, parametric amplification, backward wave amplifiers, backward oscillation in laser systems, phase conjugation and multiple-wave

mixing systems, Pockel and Kerr effects, and electro-optical modulations in optical communication systems. Prerequisite: 375 or consent of instructor.

577-3 Antenna Theory and Design. The application of Maxwell's equations to radiating structures. Theory and design of antennas. Prerequisite: 477, or consent of instructor.

580-1 to 4 Seminar. Collective and individual study of selected issues and problems relating to various engineering areas.

582-3 HVDC Transmission. Static power conversion. Harmonics. Control of HVDC systems. Interaction between AC and DC systems. Design considerations. Faults and protection. Prerequisite: 487 or consent of instructor.

583-3 Control of Power Electronics and Drives. Properties of power semiconductor devices. Operating characterisitcs of AC and DC machines. Converters and cycloconverters principles and operation. Control of the DC motor. Control of the induction motor. Microcomputer application. Prerequisite: 483 or consent of instructor.

584-3 Advanced Computer Aided Circuit Analysis and Design. Network topology, nodal and mesh analysis of networks. Nonlinear networks, harmonics. State space analysis of networks. Sensitivity analysis. Prerequisite: consent of instructor.

586-3 Power Systems Analysis II. Techniques for solving power system problems. Network reduction. Load-flow, short-circuit, and transient-stability studies. Utilization of digital and analog computers. Prerequisite: 487.

587-3 Power System Operation and Control. Advanced mathematical and operations research methods applied to power systems such as economic dispatch, unit commitment, transmission losses, control of generation, power pools, and power system security. Prerequisite: 488 or consent of instructor.

588-3 Advanced Electrical Network Theory. Graph theory. Steady-state solution of linear and nonlinear networks. Transfer function techniques. Sensitivity analysis for networks. Prerequisite: 484 or consent of instructor.

589-3 Advanced Electric Power Distribution. Analysis and design of distribution networks. Includes study of load characteristics, substations, feeders, and voltage-control and protection devices. Prerequisite: 489 or consent of instructor.

592-1 to 3 Special Investigations in Electrical Engineering. Individual advanced projects and problems selected by student or instructor. Prerequisite: graduate standing and consent of instructor.

593-1 to 3 Advanced Topics in Electrical Engineering. Lectures on advanced topics of special interest to students in various areas of electrical engineering. This course is designed to offer and test new experimental courses in electrical engineering. Prerequisite: consent of instructor.

599-1 to 6 Thesis.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S / U* or *DEF* only.

Mechanical Engineering and Energy Processes

Graduate work in the Department of Mechanical Engineering and Energy Processes is offered toward a concentration for the Master of Science degree in engineering. Safety glasses are required for some of the courses in this department. Four-hundred level courses in this department may be taken for graduate credit unless otherwise indicated in the course description.

Mechanical Engineering

400-3 Power and Refrigeration Cycles. Use of engineering thermodynamics in analysis of power and refrigeration cycles. Detailed treatment of various gas and vapor power cycles including combined gas and steam cycles. Thermodynamics of combustion. Gas and vapor refrigeration cycles. First and Second Law analysis and turbo-machinery. Prerequisite: Engineering 300.

401-1 Thermal Measurements Laboratory. Study of basic physical measurements used in the thermal sciences. Calibration techniques for temperature and pressure sensors. Thermal measurements under transient and steady-state conditions. Applications include conduction, convection, and radiation experiments. Uncertainty analysis. The handling and reduction of data. Prerequisite: Engineering 222 and 302.

402-3 Heat Exchange Equipment Design. Engineering design of heat exchange equipment such as boilers, evaporators, cooling towers, furnaces, and systems involving combinations of conduction, convection and radiation mechanisms. Emphasis is placed on application of basic principles of heat transfer and fluid mechanics to the design of heat exchange equipment. Students are encouraged to work "open-ended" problems with multiple possible solutions. Prerequisite: Engineering 222, 302, and 313.

403-1 Mechanical Engineering Measurements Laboratory. Laboratory to familiarize students with the use of instruments to measure time, distance, velocity, acceleration, strain, fluid flow, and turbulence. Instruments include micrometers, laser distance meters, stroboscopes, oscilloscopes, incremental rotary encoder, LVDT, load cells, accelerometers, analog/digital convertors, pressure transducers, and related equipment. Prerequisite: 303, Engineering 311 and 313.

404-4 Optimization of Process Systems. Simulation and optimization of process systems based upon engineering science and economic fundamentals. Analysis and correlation of experimental engineering data and use of correlated data in simulation, design and decision making. Design of systems using economics and continuous and discrete optimization methods encountered in engineering practice. Use of the computer

is required. Prerequisite: Engineering 361, Mathematics 305 and senior standing in engineering.

405-3 Internal Combustion Engines and Gas Turbines. Operation and performance characteristics of Otto, Diesel, Wankel engines and gas turbines. Methods of engine testing, types of fuels and their characteristics, fuel metering systems, engine combustion analysis as related to engine performance, fuel characteristics and air pollution, exhaust gas analysis, and air pollution control. Prerequisite: Engineering 300.

406-3 Thermal Systems Design. Applications of the principles of engineering analysis to the design of thermal systems. Consideration of such systems as refrigeration, air conditioning, spacecraft thermal control, and cogeneration. Numerical analysis and solution of an open-ended design problem. Prerequisite: Engineering 222, 300, and 302.

408-3 Energy Conversion Systems. Principles of advanced energy conversion systems; nuclear power plants, combined cycles, magnetohydromagnetics, cogeneration (electricity and process steam), and heat pumps. Constraints on design and use of energy conversion systems; energy resources, environmental effects, and economics. Prerequisite: Engineering 301 or 400.

410-3 Applied Chemical Thermodynamics and Kinetics. Designed for students interested in chemical and environmental processes and materials science. Topics covered include applications of the Second and Third Laws of Thermodynamics, solution theory, phase equilibria, sources and uses of thermodynamic data, classical reaction rate theory, kinetic mechanisms, and the determination of rate-determining steps in chemical reactions. Prerequisite: Chemistry 222, Engineering 300 or consent of instructor.

414-3 Noise and Vibration Control. Principles of engineering acoustics and vibration and their application to noise and vibration control techniques. Laboratory experience demonstrates techniques for control and reduction of vibration and noise. Prerequisite: 470 or consent of instructor.

416-3 Air Pollution Control. Engineering control theory, procedure, equipment, and economics related to control of particulate, gaseous, and toxic air emissions. The environmental impacts due both to controlling and not controlling emissions are considered. Understanding of the basics is evaluated as students design control equipment, specify and troubleshoot control systems and predict the impacts for each major type of control system. Prerequisite: Senior standing.

418-1 Air Quality Laboratory. This laboratory consists of design, construction, and use of systems to measure and analyze ambient atmospheric pollution. Safety glasses required. Prerequisite: concurrent enrollment in 416.

419-3 Hazardous Waste Incineration. Incineration techniques, procedures and systems are presented for solid waste disposal and for remedial site clean-up activities. This includes regulations, waste handling, emission controls and residue disposal. Thermodynamics, chemistry and equipment are discussed, including heat recovery. Prerequisite: 416 or consent of instructor.

422-3 Applied Fluid Mechanics for Mechanical Engineers. Applications of fluid mechanics in internal and external flows. The mathematical basis for inviscid and vicous flows calculations is developed with application to pipe and duct flows; external flow about bodies; drag determination; turbomachinery; and reaction propulsion systems. Semester design project of a fluid mechanical system. Prerequisite: ENGR 300, 313 and MATH 305.

423-3 Compressible Flows. Foundation of high speed fluid mechanics and thermodynamics. One-dimensional flow, isentropic flow, shock waves and nozzle and diffuser flows. Flow in ducts with friction and heat transfer. Prandtl-Meyer flow. Compressibility effects in reaction propulsion systems. Semester design project. Prerequisite: ENGR 300, 313.

430-3 Kinematic Synthesis. Kinematic synthesis of linkages, single loop and multiple loop mechanisms, and geared linkages. Vector synthesis of spatial mechanism and its computer simulation. Prerequisite: 310.

435-3 Design of Mass Transfer Processes. Design principles of mass transfer processes. The rate mechanism of molecular, convective, and interphase mass diffusion. The design of selected industrial mass transport process operations such as absorption, humidification, water-cooling, drying, and distillation. Prerequisite: Engineering 302.

436-3 Mechanical Systems Control. Mathematical modelling of controls for mechanical systems. Dynamic behavior of controlled machines. Design of controlled mechanical systems. Prerequisite: 303 and 470 or consent of instructor.

440-3 Heating, Ventilating, and Air Conditioning Systems Design. Principles of human thermal comfort. Heating and cooling load analysis. HVAC system design. Air conditioning processes. Prerequisite: Engineering 300, 302.

442-3 Passive Solar Design. Design of solar heating systems for residence with emphasis on passive systems. Heat flow and heat loss. Estimating heat loss and heating requirements of buildings. Energy conserving building design. Predicting performance and economics of a system. Prerequisite: Engineering 300, 302.

446-3 Energy Management. Fundamentals and various levels of analysis for energy management of commercial buildings and industrial processes and buildings. Use of energy management systems and economic evaluations are required in course projects. Prerequisite: Engineering 300, 302, and 313.

462-3 Physical Metallurgy. Structure of metals. Dislocation theory and plasticity. Solid state diffusion. Thermodynamics of solutions and phase diagrams. Phase transformations. Fracture mechanics. Creep and fatigue. Prerequisite: Engineering 222 and 312.

463-3 Introduction to Ceramics. Structure and physical properties, mechanical properties, processing and design of ceramics. Prerequisite: Engineering 312 or equivalent.

465-3 Materials Preparation and Processing. Forming and processing of materials. Solidification: single crystal techniques, plane front and dendritic solidification, microsegregation, nonequilibrium structures. Vapor deposition: fractionation, physical vapor deposition, ion plating, sputtering. Thermal processing of solids: homoge-

nization, crystallization, precipitation. Powder preparation, sintering, and densification. Deformation processing: rolling, forging, extrusion, drawing, preferred orientation. Prerequisite: 462.

470-3 Simulation and Control of Machines. Dynamic simulation and control of machines. Vibration analysis of mechanical systems, applications of La Place tranform to modeling mechanical systems, transfer functions, and open/closed loops. Response of basis control systems. Prerequisite: Engineering 260b and Mathematics 305.

472-3 Materials Selection for Design. Interaction of material design process with material selection criteria. Comparison of materials properties, processes, and fabrication. Project work includes design models, material selection rationale, oral presentation of projects, construction of mock-up models, and theoretical design problems in the area of the student's specialization. Prerequisite: Engineering 222, 312.

475-3 Machine Design I. Design of machines using bearings, belts, clutches, chains, and brakes. Develops application of the theory of fatigue, power transmission, and lubrication to the analysis and design of machine elements. Prerequisite: 310, Engineering 222 and 311.

476-3 Machine Design II. Design of machines using gears, springs, screws and fasteners, and adhesives. Matching power sources to driven machines. Prerequisite: 475.

477-3 Fundamentals of Computer-Aided Design and Manufacturing. Introduction to the concepts of computer-aided design and manufacturing (CAD/CAM). Subjects include computer graphics, geometric modelling, engineering analysis with FEM, design optimization, computer numerical controls, project planning, and computer integrated manufacturing. (CIM). Students are required to use computer packages for projects. Prerequisite: 475 or consent of instructor.

492-1 to 5 Special Problems in Engineering. Engineering topics and problems selected by either the instructor or the student with the approval of the instructor. Five hours maximum course credit. Prerequisite: senior standing and consent of instructor.

500-3 Advanced Engineering Thermodynamics. Principles of kinetic theory and classical statistical mechanics applied to thermodynamic systems. Statistical interpretation of the equilibrium state and thermodynamic properties of engineering systems. Introduction to irreversible thermodynamics with engineering examples. Prerequisite: ENGR 300.

501-3 Transport Phenomena. Mechanism of heat, mass, and momentum transport on both molecular and continuum basis. Estimation of transport properties. Generalized transport equations in one- or three-dimensional systems. Analogy of mass, heat, and momentum transfer. Macroscopic balances, simultaneous mass, and heat transfer. Prerequisite: ENGR 302.

502-3 Advanced Heat Transfer. Engineering considerations involved in the construction of mathematical and numerical models and the interpretation of results of analyses of conduction and radiation heat transfer mechanisms. Prerequisite: ENGR 302.

503-3 Convective Heat Transfer. Laminar and turbulent convective heat transfer over surfaces and inside tubes. Heat transfer inside non-circular tubes. Heat transfer in developing flows. Heat transfer at high velocities. Influence of temperature-dependent properties. Prerequisite: ENGR 302.

504-3 X-Ray Diffraction and Electron Microscopy. (Same as Physics 571.) X-ray physics. Geometry of crystals. Scattering of X-ray by atoms, crystals, and noncrystalline matter. Kinematical theory of diffraction. Powder method, Laue method. Electron optics. Formation and analysis of diffraction patterns. Imaging techniques. Image contrast theories. Analysis of crystal defects. Advanced analytical electron microscopes.

506-3 Solidification Processing. Heat flow in solidification. Plane front, cellular, dendritic, eutectic, and spherulitic micromorphologies. Micro and macro segregation. Fluid flow during solidification. Processing and properties of castings. Rapid nonequilibrium solidification techniques. Prerequisite: 464.

507-3 Combustion Phenomena. Basic combustion phenomena-chemical rate processes-flame temperature, burning velocity, ignition energy, quenching distance, and inflamability limits-laminar and turbulent flame propagation-aerodynamics of flame-gaseous detonations-two phase combustion phenomena-fluidized bed combustion. Prerequisite: ENGR 300.

509-3 Thermal Radiation Heat Transfer. Review of radiation fundamentals. Prediction of radiative properties using classical electromagnetic theory. Properties of real materials. Governing equations between blackbody and gray surfaces. Effects of specular reflecting non diffuse, non gray surfaces. Radiation in the presence of other energy transfer modes. Approximate and computer solution techniques. Prerequisite: ENGR 302.

510-3 Electrochemical Engineering. Principles underlying electrochemical processes. Transformation of chemical and electrical energy. Application of fundamental electrochemical laws to industrial processes, energy conversion, corrosion, and reactor design. Prerequisite: consent of instructor.

520-3 Coal Conversion and Combustion Processes. The major presentday and proposed processes converting coal to other energy forms (gaseous and liquid fuels, coke, steam, electricity, etc.). Coal properties and chemical reaction relationships affecting conversion process paths. Design of coal gasification, liquefaction, combustion, and carbonization reactor systems. Environmental assessment and cost considerations related to coal conversion. Prerequisite: graduate standing or consent of instructor.

525-3 Small Particle Phenomena. Small particle formation, behavior, properties, emission, collection, analysis, and sampling. Includes atomization, combustion, transport of suspension and sols, filtration, light scattering, and movement patterns of mono and polydisperse particles and use of a device to measure size, size distribution, and one other physical property of an aerosol. Prerequisite: graduate standing.

531-4 Reaction Engineering and Rate Processes. Chemical kinetics of homogeneous and heterogeneous reactions, kinetic theories, mechanism and mathematical modeling. Reactor design.

Design of multiple reactions; temperature and pressure effects. Nonisothermal and nonadiabatic processes. Non-ideal reactors. Prerequisite: 435.

532-3 Separation Processes and Equilibrium Operations. Phase equilibrium, multistage calculations, graphical methods, unsteady-state stagewise operations. Multicomponent systems. Rate separation processes. Applications in processing industry. Prerequisite: 435.

535-3 Computer Aided Analysis of Mechanical Systems I. Computer aided kinematic and dynamic analysis of planar mechanism: topics will include formulation of kinematic and dynamic equations of motion for planar systems. Automatic generations of kinematic constraint such as resolute joint, translation joint, etc. Numerical techniques for solution of nonlinear, differential, and algebraic equations, application of these techniques to planar mechanism and robotic systems. Prerequisite: 310.

536-3 Computer Aided Analysis of Mechanical Systems II. Computer aided kinetic and dynamic analysis of spatial mechanical systems. Topics will include: formulation of kinematic and dynamic equations of motion of spatial systems using Euler angles and quaternions, automatic generation of kinematic constraints such as spherical joints, universal joints, etc., numerical methods for spatial mechanisms, modeling of spatial mechanisms, general purpose software development and its application. Prerequisite: 535.

540-3 Introduction to Continuum Mechanics. Tensor analysis applied to continuum mechanics: stress and strain and their invariants, equations of compatibility, constitutive equations —including linear stress-strain relations. Prerequisite: MATH 305, ENGR 311, graduate standing in engineering.

560-3 Surface Science and Interfaces. Surface structure and composition; ultrahigh vacuum techniques; surface analytical instruments; grain boundary structure; absorption; catalysis; grain boundary embrittlement.

562-3 Environmental Degradation of Materials. Course designed for majors in engineering and the physical sciences. Topics covered include general corrosion, oxidation, hydrogen embrittlement, stress corrosion cracking, and fine particle erosion. Approach will draw on principles of chemistry and materials science. Prerequisite: CHEM 222 and one of the following: 460, 462 and ENGR 312, or consent of instructor.

580-1 to 4 Seminar. Collective and individual study of issues relating to thermal and environmental engineering. Four hours maximum course credit.

581-1 Scientific Evaluation and Research in Engineering. Concepts and procedures for undertaking and conducting research projects are covered. This includes surveying relevant scientific literature and expands upon techniques for obtaining, evaluating, and reporting existing and measured data. Required of all department graduate students. Prerequisite: graduate studies in engineering.

592-1 to 4 Special Investigations in Engineering. Advanced topics in thermal and environmental engineering. Topics are selected by mutual agreement of the student and instructor. Four hours maximum course credit. Prerequisite: consent of instructor and department chair.

599-1 to 6 Thesis. Six hours maximum course credit.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Engineering Technology

There is no graduate program offered through engineering technology. See manufacturing systems for graduate program description. Four-hundred-level courses in this listing may be taken for graduate credit unless otherwise indicated in the course description.

The student is required to purchase photographs and maps for certain courses, and a suitable slide rule is strongly recommended for most courses. Cost is approximately $10 to $25.

401-3 Refrigeration and Air Conditioning. Applications of thermodynamics and heat flow to air conditioning systems. Heating and cooling load analysis. Principles of human comfort. Discussion of various refrigeration and air conditioning cycles and their application to laboratory simulators. Prerequisite: 313b, laboratory.

403-8 (4, 4) Electronics Technology. (a) Fundamental theory and operation of semiconductor diodes and bipolar transistors, incremental models for transistors, biasing, stability, and feedback of single and multistage amplifiers. Parameters and applications of field-effect transistors, optoelectronic devices, thyristors, unijunction transistors and amorphous semi-conductors. Laboratory. **(b)** Parameters and applications of operational amplifiers, linear integrated circuits, monolithic voltage regulators, and digital integrated circuits. Laboratory. Must be taken in a,b sequence. Prerequisite: 304b.

413-4 Field Survey Problems. Perform extensive field projects in the areas of engineering, hydographic, land and control surveying. To be held at Crab Orchard National Wildlife Refuge. Course must be taken concurrently with 414. Prerequisite: 263 and one of 361, 362, or 363.

414-2 Field Project Planning and Computations. Planning, organization, computations, and drafting of field survey projects including the needed mapping utilizing calculators, computers, and CAD. This course must be taken concurrently with 413. Prerequisite: 263 and one of 361, 362, or 363.

415-4 Elementary Structural Design. Introduction to structural properties of steel and reinforced concrete. Design of basic steel elements: tension members, beams, columns, and connec-

tions. Basic design of reinforced concrete elements: beams, columns, and footings. Use of AISC and ACI codes. Prerequisite: 202, 311 (or concurrent enrollment), 315.

424-6 (3, 3) Power Systems Technology. (a) Fundamentals of basic power plant operation and equipment; e.g., fuels, steam generators, heat exchangers, turbines, pumps, and nuclear reactors. Prerequisite: 313a, Engineering 222. **(b)** A study of cycles, heat balances, efficiencies, and power plant economics. Student is exposed to the design considerations and trade-offs associated with the total design of a power plant. Prerequisite: 318, 424a.

426-5 (3, 2) Photogrammetry. (a) Cameras and photography; flight planning; mathematical principles of vertical and tilted aerial photographs; ground control methods; extension of control; stereoscopy and parallax; basic instruments, stereo plotters, and latest developments. Laboratory. Prerequisite: 263 or consent of instructor. **(b)** Rectification of tilted photographs; stereoscopic plotting instruments; principles and use of oblique photography; analytic photogrammetry and new concepts. Laboratory. Prerequisite: 426a or consent of instructor.

437-8 (4, 4) Communications Systems Technology. (a) Theory and applications of radio frequency transmission lines, waveguides, optical fibers, wave propagation, and antennas. Laboratory. Prerequisite: 304b. **(b)** Theory and applications of analog and digtal communications systems. Laboratory. Prerequisite: 403a, 437a.

438-8 (4, 4) Continuous and Digital Control Systems. (a) Fundamentals of continuous control systems; equation of electrical, hydraulic and thermal systems; application of LaPlace transforms, transfer functions, block diagrams, and flow graphs. Computer implemented graphical analysis and design methods: root locus, frequency response. Nyquist diagrams and compensator design. Continuous systems laboratory. Prerequisite: 304b. **(b)** Fundamentals of digital control systems, Stepper motors, digital data acquisition and interface components, Fourier transforms, Z transforms, and applications of fast Fourier transform. Digital control laboratory. Prerequisite: 438a.

439-4 Microprocessor Applications and Hardware. A study of microprocessor applications and hardware based on microprocessor manufacturer's literature. System configuration, hardware, requirements, typical instruction set, programming, input/output techniques, interfaces, and peripheral devices. Prerequisite: 238.

445-3 Computer-Aided Manufacturing. (Same as Industrial Technology 445) Introduction to the use of computers in the manufacture of products. Includes the study of direct and computer numerical control of machine tools as well as interaction with process planning, inventory control, and quality control. Laboratory. Prerequisite: IT 208, computer programming, or consent of instructor.

455-3 Industrial Robotics. (Same as Industrial Technology 455(Study of industrial robots and their applications; pendant and numerical programming of robots. Robotics design including tactile and visual sensors. Technical and psychological problems of justification, installation, and management of robotic systems. Prerequisite: 445.

492-1 to 6 Special Problems in Industry and Technology. Special opportunity for students to obtain assistance and guidance in the investigation and solution of selected technical problems. Prerequisite: consent of instructor.

English

401-3 Modern English Grammars. A review of modern approaches to grammatical analysis in English language (only), this course is specifically designed to meet needs of in-service or prospective teachers of composition and language arts, particularly at the secondary and college levels.

402-3 Old English Language and Literature. Introduction to the language, literature and culture of Anglo-Saxon England, with special emphasis on Old English heroic and elegaic poetry, exclusive of *Beowolf*.

403-3 History of the English Language. A survey of the development of the language from Indo-European to modern English with special emphasis on Middle and Early Modern changes.

404-3 Middle English Literature Excluding Chaucer.

405-3 Middle English Literature: Chaucer.

412-3 English Non-Dramatic Literature: The Renaissance.

413-3 English Non-Dramatic Literature: The Restoration and Earlier Eighteenth Century.

414-3 English Non-Dramatic Literature: The Later Eighteenth Century.

421-3 English Romantic Literature.

422-3 Victorian Poetry. Victorian poets: Tennyson, Browning, Arnold, and other poets in England.

423-3 Modern British Poetry.

425-3 Modern Continental Poetry. Representative poems by major 20th century poets of France, Italy, Germany, Spain, Russia, and Greece.

426-3 American Poetry to 1900. Trends in American poetry to 1900 with a critical analysis of the achievement of the more important poets.

427-3 American Poetry from 1900 to the Present. The more important poets since 1900.

433-3 Religion and Literature. Introduce students to the study of religious meaning as it is found in literature.

436-3 to 9 (3 per topic) Major American Writers. Significant writers of fiction and nonfictional prose from the Puritans to the 20th Century. May be repeated only if topic varies, and with consent of department.

438-3 Intellectual Backgrounds of American Literature. The relationship of basic ideas in America to American literature.

445-3 Cultural Backgrounds of Western Literature. A study of ancient Greek and Roman literature, Dante's *Divine Comedy*, and Goethe's *Faust*, as to literary type and historical influence on later Western writers.

451-3 Eighteenth Century English Fiction. Defoe through Jane Austen.

452-3 Nineteenth Century English Fiction. Victorian novel: 1830-1880.

453-3 Modern British Fiction.
455-3 Modern Continental Fiction. Selected major works of Europe an authors such as Mann, Silone, Camus, Kafka, Malraux, Hesse.
458-3 American Fiction to the Twentieth Century. The novel in America from its beginnings to the early 20th Century.
459-3 American Fiction of the 20th Century. Trends and techniques in the American novel and short story since 1914.
460-3 Elizabethan and Jacobean Drama. Elizabethan drama excluding Shakespeare: such Elizabethan playwrights as Greene, Peele, Marlowe, Heywood, Dekker; and Jacobean drama: such Jacobean and Caroline playwrights as Jonson, Webster, Marston, Middleton, Beaumont and Fletcher, Massinger, Ford, Shirley.
462-3 English Restoration and 18th Century Drama. After 1660, representative types of plays from Dryden to Sheridan.
464-3 Modern British Drama.
465-3 Modern Continental Drama. The continental drama of Europe since 1870; representative plays of Scandinavia, Russia, Germany, France, Italy, Spain, and Portugal.
468-3 American Drama. The rise of the theater in America, with readings of plays, chiefly modern.
471-3 Shakespeare: The Early Plays, Histories, and Comedies.
472-3 Shakespeare: The Major Tragedies, Dark Comedies, and Romances.
473-3 Milton. A reading of a selection of the minor poems, of *Paradise Lost, Paradise Regained, Samson Agonistes,* and the major treatises.
481-3 Literature for the Adolescent. Criteria for evaluation of literary materials for junior and senior high school, with emphasis on critical approaches in selection of literature.
484-3 Non-Print Media and English. Theory and application of film and other non-print media to the study and teaching of English. Especially emphasized is the relationship between print and non-print communications systems and verbal and non-verbal systems. Prerequisite: consent of instructor.
485-3 Problems in Teaching Composition, Language, Literature and Reading in High School.
487-3 Old Age in Literature. An examination of how literature can contribute to our understanding of aging, using texts that will focus on such issues as physical and cognitive changes, work and retirement, intergenerational relationships, death and dying.
490-3 Expository Writing. An advanced expository writing course designed to improve the student's ability to write clear and effective expository prose. The main work of the course will consist of the writing and revising of a set of essays that reflect a variety of rhetorical strategies. Required readings will provide models and subject matter for some of the assignments. Prerequisite: GED 101 and 117, 118, 119 or 120 or equivalent; English 390 or equivalent.
491-3 Technical Writing. An all-University course designed to teach advanced academic and professional (non-fictional) writing skills. Prerequisite: GED 102 or equivalent.
492-3 to 9 Creative Writing Seminar. The topic varies among the writing of poetry, drama, or prose. A directed written project will be submitted at the end of the semester in prose, poetry, or drama. A collection of short stories or poems, a novel or play of what instructors consider to be acceptable quality will fulfill the seminar requirement. Prerequisite: consent of instructor.
493-3 to 9 (3 per topic) Special Topics in Literature and Language. Topics vary and are announced in advance; both students and faculty suggest ideas. May be repeated as the topic varies.
494-3 Literary Criticism Applied to Film. The course will deal with the history and theories of literary criticism. Students will have the opportunity to apply concepts of literary criticism to a series of films which they will view. A $10 screening fee is required.
495-3 A Survey of Literary Criticism. An introductory course to the history of criticism and major recent schools of literary criticism and theory. Required of M.A. students with a concentration in literature and all Ph.D. students.
496-3 to 6 (3, 3) Topics in Women's Literature. (Same as Women's Studies 454.) Syllabus, which may vary with instructor, identifies new areas of research on women authors and includes an examination of appropriate critical models that have emerged in feminist criticism.
498-3 to 9 Internships. For English majors only. Student may take up to nine semester hours to receive credit for internships with SIU Press, Special Collections, University Museum, Coal Center, and other academic units. Prerequisite: written approval from department and academic unit.
499-1 to 6 (1 to 3, 1 to 3) Readings in Literature and Language. For English majors only. Prior written departmental approval required. May be repeated as the topic varies, up to the maximum of six semester hours.
501-3 Research in Composition. Materials and methods of research in composition teaching, curriculum, and administration. Analysis of significant research and designing of research will be included. Prerequisite: GE-D 101 and 117, 118, or 119, or 120, or equivalent; 390 or equivalent.
502-3 Introduction to Graduate Study and Teaching College Composition. An introduction to research methods and materials which includes a survey of critical approaches to the study of English and American literature, combined with an introduction to methods and materials related to the teaching of basic compositional skills on the college level. This course is required of all graduate assistants who have no previous college teaching experience or no familiarity with basic research techniques.
506-3 to 12 Anglo-Saxon and Medieval Studies. Seminars on various topics from Old and Middle English literature including the works of Chaucer. May be repeated only with different topics and the consent of the department.
510-3 to 12 Renaissance Studies. Seminars in varying topics concerned with the literature of the 16th and 17th centuries and the drama of Shakespeare. May be repeated only with different topics and the consent of the department.
516-3 to 12 Restoration and 18th Century Studies. Seminars in varying topics concerning the literature of the period. May be repeated only

with different topics and the consent of the department.

530-3 to 12 19th Century English Literature. Seminars in various topics concerning the literature of the Romantic and Victorian periods. May be repeated only with different topics and the consent of the department.

533-3 to 12 Early American Literature. Seminars in varying topics in American literature. May be repeated only with different topics and the consent of the department.

539-3 to 12 Modern American Literature. Seminars in varying topics concerning Modern American literature. May be repeated only with different topics and the consent of the department.

550-3 to 12 Modern British Literature. Seminars in varying topics concerning Modern British literature. May be repeated only with different topics and the consent of the department.

579-3 to 12 (3 per topic) Studies in Modern Literature. May be repeated only if the topic varies, and with consent of department.

581-3 to 9 (3 per topic) Problems in Teaching English. May be repeated only if the topic varies, and with consent of department.

592-3 to 9 Creative Writing Seminar. Advanced workshops offered in both fiction and poetry. Class content derives primarily from student's work. Genre announced in advance. Prerequisite: 492 in appropriate genre.

593-3 to 12 Special Topics. Seminars in varying topics concerning language and literature. May be repeated only with different topics and the consent of the department.

594-3 Contemporary Literature Seminar. Advanced seminars offered in both contemporary poetry and contemporary fiction. Taught by creative writers and designed for students concentrating in creative writing. Prerequisite: consent of instructor.

595-1 to 9 Independent Readings. Preparatory for preliminary examinations for doctoral students in English. May be taken once only, grade of *S/U,* according to the result of the preliminary examination. Prerequisite: twenty-four classroom credit hours beyond the M.A., exclusive of audits and readings.

596-3 to 12 Language Studies. Seminars in varying topics concerning theories of rhetoric, grammar, and the teaching of prose composition. May be repeated only with different topics and the consent of the department.

599-3 Thesis. For masters' students who elect to write a thesis in lieu of one three hour graduate course. Prerequisite: successful completion of 15 hours of graduate work on the master's degree and consent of the thesis director.

600-1 to 36 (1 to 12 per semester) Dissertation.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

English as a Foreign Language

(See Linguistics.)

Finance

(See Business Administration.)

Foreign Languages and Literatures

436-3 Methods in Teaching Foreign Languages. Survey of general principles of second-language teaching, based upon insights of modern linguistics and learning-psychology. Followed by intensive practical work in classroom and language laboratory with teachers experienced in the student's specific language field. Required of prospective teachers of foreign languages in secondary schools. Prerequisite: concurrent or prior enrollment in 300-level course in French, German, Latin, Russian, or Spanish.

506-1 to 4 Research Problems—French. Individual research on a literary or linguistic problem involving original investigation in areas not covered by seminars or thesis. Two hours may be used for a research paper for non-thesis programs.

507-1 to 4 Research Problems—German. Individual research on a literary or linguistic problem involving original investigation in areas not covered by seminars or thesis. Two hours may be used for a research paper for non-thesis programs.

508-1 to 4 Research Problems—Russian. Individual research on a literary or linguistic problem involving original investigation in areas not covered by seminars or thesis. Two hours may be used for a research paper for non-thesis programs.

509-1 to 4 Research Problems—Spanish. Individual research on a literary or linguistic problem involving original investigation in areas not covered by seminars or thesis. Two hours may be used for a research paper for non-thesis programs.

535-2 Critical Theory. Theories of literature and theories underlying literary criticism, taken logically rather than chronologically. Extensive reading, in the original language whenever possible, of both primary statements and exemplificative documents.

566-3 Bibliography and Research Techniques. Introduction to the use of the chief reference works in the humanities and social sciences as they pertain to foreign languages in general. Also, extensive work with bibliography and research methods in French, German, or Spanish.

568-2 Bibliography and Research Techniques—Russian. Bibliography and research methods in the target language and its culture. Introduction to the use of the chief reference works in the humanities and social sciences as

they deal with areas in which the target language is spoken.

Chinese

No graduate program in Chinese is offered through the Eastern Languages and Civilization section. Four-hundred-level courses in this section may be taken for graduate credit unless otherwise indicated in the course description.

410-3 The Linguistic Structure of Chinese. (Same as Linguistics 411.) Phonology and syntax of Mandarin Chinese. Principal phonological features of major Chinese dialects. Special emphasis on the contrastive analysis between Mandarin Chinese and English. Theoretical implications of Chinese syntax for current linguistic theories. Prerequisite: one year of Chinese or introduction to linguistics.

435-3 Business Chinese. An overview of China's business through reading in Chinese dealing with the major aspects of China's foreign trade ranging from broad principles and policies to concrete details of operation and procedure. Enhancement of conversational skills for business contexts. Prerequisite: 320 or equivalent.

490-1 to 6 Advanced Independent Study in Chinese. Directed individual study of some question, author, or theme of significance in the field of Chinese literature, language, or culture. Prerequisite: consent of instructor.

Classics

No graduate program is offered through the classics section. Four-hundred-level courses in this section may be taken for graduate credit unless otherwise indicated in the course description.

Courses numbered 388 and 488 are designed to help graduate students prepare for proficiency examination required by certain departments as evidence of competency in Latin. No prerequisite is stipulated. Students must register for these courses and are advised to take them as part of, not in addition to, their graduate program. Students will not receive graduate credit for courses numbered below 400.

388-3 Latin as a Research Tool. Intensive study of Latin as basis for development of reading knowledge. Covers grammar and vocabulary portion of first-year sequence in basic skills. Intended for graduate students. Undergraduates who wish to enroll are encouraged to consult with course instructor.

405-2 Greek Literature in Translation. (Same as Women's Studies 463.) Reading and analysis of selected classical Greek author(s), genre(s), theme(s), such as the role of woman, the social life of the ancient Greeks, etc. Students taking the course for graduate credit will do a critical study of one aspect. No knowledge of Greek or Latin is required.

406-2 Latin Literature in Translation. Reading and analysis of selected Roman author(s), genre(s), theme(s). Students taking the course for graduate credit will do a critical study of one aspect. No knowledge of Greek or Latin is required.

415-1 to 9 (1 to 3 per topic) Readings from Greek Authors in Greek. Reading and interpretation of works of Greek literature at an advanced level. Prerequisite: two semesters of 300-level Greek or consent of instructor.

416-1 to 9 (1 to 3 per topic) Readings from Latin Authors in Latin. Reading and interpretation of works of Latin literature at an advanced level. Prerequisite: two semesters of 300-level Latin or consent of instructor.

488-3 Advanced Latin as a Research Tool. Concentrated and individualized training in the recognition and interpretation of basic and complex grammatical structures and in the systematic acquisition of the principles of word formation for vocabulary expansion. Techniques for intensive and extensive readings and for translation of unedited texts in the student's own field of study. Intended for graduate students. Undergraduates who wish to enroll are encouraged to consult with course instructor. With consent of student's own department, and with a grade of *B* or *A*, satisfies graduate program requirements for foreign languages as research tool. Prerequisite: 388 or one year of Latin or equivalent.

French

Courses numbered 388 and 488 are designed to help graduate students prepare for proficiency examination required by certain departments as evidence of competency in French. No prerequisite is stipulated. Students must register for these courses and are advised to take them as part of, not in addition to, their graduate program. Students will not receive graduate credit for courses numbered below 400.

388-3 French as a Research Tool. Intensive study of Latin as basis for development of reading knowledge. Covers grammar and vocabulary portion of first-year sequence in basic skills. Intended for graduate students. Undergraduates who wish to enroll are encouraged to consult with course instructor.

410-3 Advanced Language Study. Designed to improve language skills beyond the level of 320. Selected grammar review and intensive practice in effective use of the written and spoken language through translations and free compositions. Prerequisite 320a.

411-3 Linguistic Structure of French. (Same as Linguistics 413.) Study of the phonology, morphology, and syntax of modern spoken and written French, stressing interference areas for English speakers in learning French. Prerequisite: 320a and 321 or equivalent.

412-4 History of the French Language. A survey of the phonological and morphological changes from Latin through Vulgar Latin and Old French to Modern French; study of an original Old French text, such as the *Chanson de Roland* or a romance of Chretien de Troyes. Knowledge of Latin not required.

414-3 Translation Techniques. Practice in oral translation — simultaneous and subsequent; written translation practice, from and into French, of materials from sources varying from technical, commercial, political, to general interest. Advanced grammar and syntax review as they relate to translation, with practice through exercises and translation. Prerequisite: 320a or equivalent.

415-3 Literary Stylistics. A study of the aesthetics and theory of French Literary expression. Disciplined stylistic analyses of excerpts from representative works of great French authors. Appreciation of distinctive qualities of each writer's genius. Consideration is given to various stylistic methods.

419-3 Romance Philology. (Same as Spanish 419.) Historical and comparative study of the major Romance languages: their phonology, morphology, and syntax.

420-3 Medieval and Renaissance Literature. Study of the origins of French literature emphasizing the *Chanson de Roland, Tristan,* other courtly romances, and the lyric poetry of Villon, culminating with an examination of the development of the humanistic ideas and ideals of the French Renaissance.

430-4 Baroque and Classicism. An in-depth examination of artistic and social writings of baroque and classical literary figures such as Corneille, Racine, Moliere, La Fontaine, Descartes, Pascal, Mme de LaFayette, La Bruyere, and La Rochefoucauld. Discussion, reports, papers.

435-3 Business French II. Detailed treatment of postal facilities and services, types of banks and their operations, transport of goods, import-export, bills of exchange, billing and shipping, insurance, accounting, and the stock market. These topics will be the subject of translations and of commercial correspondence. Prerequisite: 320a or equivalent, may be taken independently of 335.

440-3 Literature of the Enlightenment. Study and discussion of the novel, theater, and philosophic writing of 18th century France as literature and as expressions of the Enlightenment. Major attention given to Montesquieu, Voltaire, Diderot, and Rousseau.

450-4 Literary Movements of the 19th Century. Romanticism, Realism, and Naturalism in the novel and theater followed by an examination of the reaction to these movements and of the influence of symbolism.

460-4 Studies in Literature of the 20th Century. Examination of the major themes, forms, techniques, and style of novelists from Gide and Proust to Robbe-Grillet and dramatists from Giraudoux to Ionesco and Beckett.

470-4 French Culture and Civilization. Study of contemporary France: values, attitudes, beliefs, and instructions. French civilization (history, literature, and the arts) will be treated mainly as a means of better understanding present day France. Offered in French. Prerequisite: 320a or permission of instructor.

475-3 to 6 Travel-Study in France. Travel-study project, planned under supervision of French faculty and carried out in France. Amount of credit depending on scope of study. Prerequisite: 320a or equivalent.

476-3 to 6 (3, 3) French Civilization Outside of France. Encompasses a number of individual courses, each of which focuses on one of the many areas of the world in which France has played a significant role. Manifestations of French culture and civilization, past and present, are studied and evaluated within the framework of an evolving local and global historic context.

488-3 Advanced French as a Research Tool. Concentrated and individualized training in the recognition and interpretation of basic and complex grammatical structures and in the systematic acquisition of the principles of word formation for vocabulary expansion. Techniques for intensive and extensive readings and for translation of unedited texts in the student's own field of study. Intended for graduate students. With consent of student's department, and with a grade of *B* or *A*, satisfies graduate program requirement for foreign languages as research tool. Prerequisite: 388 or one year of French, or equivalent.

490-1 to 6 Advanced Independent Study in French. Individual exploration of some question, author, or theme of significance within the field of French literature, language or culture. Prerequisite: 320a, 321 and consent of instructor.

501-2 to 6 Studies on a Selected Topic or Author. Intensive study of one author or topic.

510-3 Masterpieces of French Literature. Appreciation and analysis of selected masterpieces in French literature with special attention given to required authors and works from the Master of Arts reading list.

520-1 to 3 Literature of the Middle Ages and Renaissance. A study of selected authors, literary movements, and expressions of the political realities and the philosophical currents of the Middle Ages and Renaissance.

525-3 Descriptive Stylistics. Consideration of levels of linguistic expression in contemporary French through the study of theoretical works and representative texts. Practice in composition and translation.

536-1 Teaching French at the College Level. Prepares graduate students in French for teaching at the college level. Required of all teaching assistants in French. May not be counted to satisfy secondary certification requirements.

539-1 to 3 Literature of the 17th Century. Collaborative research in selected works of neoclassical French authors. Lectures, reports, discussions, paper.

540-1 to 3 Literature of the 18th Century. Selected topics, movements, or authors in the literature of the 18th Century.

550-1 to 3 Literature of the 19th Century. Selected topics, movements, or authors in the literature of the 19th Century.

560-1 to 3 Literature of the 20th Century. Study of an author, theme, movement, or critical literary issue of contemporary interest. Topics may range from the Existentialist vision or the Quest for Self to the novel of commitment of the New Novel.

599-1 to 6 Thesis.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed

a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S*/*U* or *DEF* only.

German

The course numbered 488 is designed to help graduate students prepare for proficiency examination required by certain departments as evidence of competency in German. No prerequisite is stipulated. Students must register for these courses and are advised to take them as part of, not in addition to, their graduate program.

410-3 Advanced Language Study. Designed to improve language skills beyond the level of 320. Selected grammar review and intensive practice in effective use of written and spoken language through translations and free compositions. Prerequisite: 320b or equivalent.

411-3 Linguistic Structure of Modern German. (Same as Linguistic 409) The descriptive study of phonology, grammatical structure, and vocabulary of modern German with consideration of its structural differences from English and application to teaching. Appropriate for students with at least two years of German. Conducted in English.

412-3 History of the German Language. Development of German from its Indo-European origin to the present in political and cultural context. The main linguistic aspects dealt with are lexical and semantic changes. Appropriate for students with at least two years of German. Readings in German. Conducted in English.

435-3 Business German. An overview of West German business, presented through lectures, readings, and discussions. Course work with textbook and supplementary materials will focus on the major aspects of German business. Exercises will include vocabulary building, listening and reading comprehension, oral and written summarization, role playing in typical situations, mock telephone conversations, and business correspondence. Prerequisite: 320 or consent of instructor.

440-3 Studies in Early German Literature. The literature of the German-speaking countries from the early Middle Ages through the seventeenth century, with varying emphasis on authors, themes, genres, periods. Prerequisite: 330 or 335, consent of instructor, or graduate standing.

450-3 Studies in 18th Century Literature. Examination of the major writers and movements together with their social, historical, and intellectual background during the 18th century in Germany and Austria. Prerequisite: 330 or 335, consent of instructor, or graduate standing.

455-3 Studies in 19th Century Literature. Detailed focus on specific aspects rather than a general survey of 19th century literature, e.g., major periods and movements, or major genres and subgenres, or major and representative authors. Prerequisite: 330 or 335, consent of instructor, or graduate standing.

480-3 Studies in 20th Century Literature. Detailed focus on specific aspects rather than a general survey of 20th century literature, e.g., major periods, movements, and tendencies, or major genres and sub-genres, or major and representative authors. Prerequisite: 330 or 335, consent of instructor, or graduate standing.

488-3 Advanced German as a Research Tool. Concentrated and individualized training in the recognition and interpretation of basic and complex grammatical structures and in the systematic acquisition of the principles of word formation for vocabulary expansion. Techniques for reading and for translation of unedited texts in the student's own field of study. Intended for graduate students. With consent of student's department, and with a grade of *B* or *A*, satisfies graduate program requirement for foreign languages as research tool. Prerequisite: Passing of CLEP test in German; or one year of college-level German; or consent of instructor (as determined by examination).

490-1 to 6 (1 to 3, 1 to 3) Independent Study in German. Project-study under supervision of German faculty. Amount of credit depends on scope of study. May be repeated as the topic varies, up to the maximum of six semester hours. Prerequisite: senior or graduate standing and approval of supervising instructor.

493-3 to 9 (3 per topic) Seminars in Special Topics in Literature and Language. Topics vary and are announced in advance; both students and faculty suggest ideas. May be repeated as the topic varies. Primarily for undergraduates. Prerequisite: consent of instructor.

501-3 to 6 (3,3) Seminar in Literature. Intensive study of a selected topic in German literature. Topics will vary and are announced in advance.

502-3 to 6 (3,3) Seminar in Germanic Linguistics. Intensive study of a selected topic in historical or descriptive Germanic linguistics. Revolving subject matter; may be repeated once for a total of six semester hours. Prerequisite: 412 or consent of instructor.

510-3 Middle High German. Grammar of Middle High German, relation of Middle High German to modern German, and selected readings (in original) from the *Nibelungenlied,* courtly epic and lyric poetry, and didactic prose.

525-3 Advanced Language Problems. Refinement of language skills through written and oral reports, translations, and advanced reading exercises. Consideration of levels of linguistic expression in modern German.

536-1 Teaching German at the College Level.

550-3 Advanced Studies in 18th Century German Literature. Intensive and extensive study of German and Austrian literature of the 18th century augmented by individual or collaborative student research projects on selected authors or topics.

555-3 Advanced Studies in 19th Century Literature. This course goes beyond GER 455 in terms of (1) more extensive and intensive readings; (2) the study of literary texts in the context of (literary) history and with respect to literary theory; (3) the reading, discussion, and application of scholarly methods and approaches to analysis/interpretation of literature; (4) requiring further independent oral and written work in German.

580-3 Advanced Studies in 20th Century Literature. This course goes beyond GER 480 in the

terms of the same considerations listed under GER 555.
590-3 to 9 (3 per topic) Independent Study on Special Topics in Literature and Language. May be repeated only if the topic varies, and with consent of department.
599-1 to 6 Thesis.
601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S / U* or *DEF* only.

Greek

No graduate program in Greek is offered. See classics for selected graduate courses in Greek.

Japanese

No graduate program in Japanese is offered through the Eastern Languages and Civilization section. Four-hundred-level courses in this section may be taken for graduate credit unless otherwise indicated in the course description.

410-3 The Linguistic Structure of Japanese. (Same as Linguistics 412.) Phonology and syntax of the Standard Japanese. Special emphasis on the contrastive analysis between Japanese and English. Typological similarities and lexical borrowings between Chinese and Japanese. Prerequisite: one year of Japanese or introduction to linguistics.
435-3 Business Japanese. An introduction to the language and culture of the Japanese business world and to the structure of the Japanese business economy. The emphasis will be on learning appropriate levels of formality and politeness in oral communication and on achieving competency in the specialized language of business. Prerequisite: 320 or equivalent.
490-1 to 6 Advanced Independent Study in Japanese. Directed individual study of some questions, author, or theme of significance in the field of Japanese literature, language, or culture. Prerequisite: consent of instructor.

Latin

No graduate program in Latin is offered. See classics for selected graduate courses in Latin.

Russian

No graduate program is offered through the Russian section. (See Chapter 2 for Russian as a teaching specialty for the Master of Science in Education degree in secondary education or in higher education.) Four-hundred-level courses in this section may be taken for graduate credit unless otherwise indicated in the course description.

Courses numbered 388 and 488 are designed to help graduate students prepare for proficiency examination required by certain departments as evidence of competency in Russian. No prerequisite is stipulated. Students must register for these courses and are advised to take them as part of, not in addition to, their graduate program. Students will not receive graduate credit for courses numbered below 400.

388-3 Russian as a Research Tool. Intensive study of Russian as basis for development of reading knowledge. Covers grammar and vocabulary portion of first-year sequence in basic skills. Intended for graduate students. Undergraduates who wish to enroll are encouraged to consult with course instructor.
411-3 Russian Stylistics. Writing styles in Russian and its application to the development of skill in written expression.
415-3 Russian Linguistic Structure. Structural analysis of present-day Russian with special attention to morphology and syntax.
430-4 Business Russian. A study of the style of commercial language and its application to the development of skill in business correspondence, such as: inquiries, offers, orders, contracts, agreements, as well as documents concerning transport, insurance, and customs. Prerequisite: 201 or equivalent.
465-3 Soviet Russian Literature. Major fiction writers and literary trends since 1917. Lectures, readings, and reports.
470-3 Soviet Civilization. Soviet culture and civilization is studied primarily through literary works, journalistic materials, and excerpts from non-literary works as general background reading. Lectures are illustrated with maps, slides, films and art works. Taught in English. Readings are in English and in bilingual edition. No prerequisite: May count toward Russian major with consent of graduate adviser.
475-2 to 3 Travel-Study in USSR. Specialized course comprising part of the travel-study program in the Union of Soviet Socialistic Republics. Prerequisite: 201 or equivalent.
480-4 Russian Realism. Authors in 19th century Russian literature. Special attention to stylistic devices. Lectures, readings, and individual class reports.
485-3 Russian Poetry. A study of literary trends and representative works of Russian poets.
488-3 Advanced Russian as a Research Tool. Concentrated and individualized training in the recognition and interpretation of basic and complex grammatical structures and in the systematic acquisition of the principles of word formation for vocabulary expansion. Techniques for intensive and extensive readings and for translation of unedited texts in the student's own field of study. Intended for graduate students. With consent of student's department, and with a grade of *B* or *A*, satisfies graduate program requirement for for-

eign languages as a research tool. Prerequisite: 388 or one year of Russian or equivalent.

490-1 to 6 Advanced Independent Study in Russian. Directed independent study in a selected area of Russian studies. Prerequisite: consent of instructor.

501-2 Seminar on a Selected Russian Author. Intensive study of one author, including the author's life, work, and place in the literary and cultural development of civilization.

502-2 Seminar in Contemporary Russian Literature. Intensive study of the works of representative Russian authors, with special reference to the correlation existing between literary expression and social, economic, and political conditions since the Revolution. Lectures, outside readings, reports are required.

599-1 to 6 Thesis.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Spanish

Courses numbered 388 and 488 are designed to help graduate students prepare for proficiency examination required by certain departments as evidence of competency in Spanish. No prerequisite is stipulated. Students must register for these courses and are advised to take them as part of, not in addition to, their graduate program. Students will not receive graduate credit for courses numbered below 400.

388-3 Spanish as a Research Tool. Intensive study of Spanish as a basis for development of reading knowledge. Covers grammar and vocabulary portion of first-year sequence in basic skills. Intended for graduate students. Undergraduates who wish to enroll are encouraged to consult with course instructor.

410-3 Advanced Language Study. Designed to improve language skills beyond the level of 320. Selected grammar review and intensive practice in effective use of the written and spoken language through translations and free compositions. Prerequisite: 320.

411-3 Linguistic Structure of Spanish. (Same as LING 414.) Theory and practice in Spanish pronunciation and study of Spanish grammatical structure, in contrast to English, with application to teaching.

412-3 History of the Spanish Language. Survey of internal and external history, from Vulgar Latin to Modern Spanish.

419-3 Romance Philology. (Same as French 419.) Historical and comparative study of the major Romance languages: their phonology, morphology, and syntax.

425-3 Spanish Literature Before 1700. The literature of Spain from its beginnings in the Middle Ages through the Golden Age.

430-3 The Golden Age: Drama. Plays of Lope de Vega, Calderon, Tirso de Molina, and others.

431-3 Cervantes. *Don Quixote.*

434-3 Colonial Literature in Spanish America. Study of the literature of Spanish America before 1825.

435-3 Business Spanish. Discussion and practice of the vocabulary, styles, and forms used in Spanish business correspondence, as well as report writing and documents dealing with trade, transportation, payment, banking, and advertising. Prerequisite: 320.

460-3 Spanish Literature of the 20th Century. The main currents and outstanding works in the literature of Spain since 1900.

463-3 Chicano Literature. An introduction to the literature written in the United States by Chicanos and other Hispanics.

485-3 The Spanish American Short Story. Survey of the genre in Spanish America.

486-3 Spanish American Drama. A survey of the development of the genre from the earliest times to the present.

487-3 The Spanish American Novel. Survey of the genre in Spanish America.

488-3 Advanced Spanish as a Research Tool. Concentrated and individualized training in the recognition and interpretation of basic and complex grammatical structures and in the systematic acquisition of the principles of word formation for vocabulary expansion. Techniques for intensive and extensive readings and for translation of unedited texts in the student's own field of study. Intended for graduate students. With consent of student's department, and with a grade of *B* or *A*, satisfies graduate program requirements for foreign languages as research tool. Prerequisite: 388 or one year of Spanish or equivalent.

490-1 to 3 Advanced Independent Study. Individual exploration of some topic in Hispanic literature, language, or culture. Prior consent of instructor required.

502-3 to 6 (3,3) Seminar in Hispanic Linguistics. Involves intensive study of a selected topic.

503-3 to 6 (3,3) Seminar in Peninsular Spanish Literature. Intensive study of a selected topic.

504-3 to 6 (3,3) Seminar in Spanish American Literature. Intensive study of a selected topic.

521-3 Medieval Spanish Literature. Studies in epic and didactic literature, and lyric poetry.

530-3 Golden Age Drama. Intensive study of Golden Age drama.

535-2 to 4 (2,2) Spanish American Literature before 1900. Intensive study of a literary movement, trend, genre, or author of the period, as specified by the topic to be announced for each semester.

536-1 Teaching Spanish at the College Level. Prepares graduate students in Spanish for teaching at the college level. Required of all teaching assistants in Spanish.

540-3 Spanish Literature of the 18th and 19th Centuries. Intensive study of a literary movement, trend, genre, or author of the period, as specified by the topic to be announced for each semester.

560-3 Spanish Literature of the 20th Century. Intensive study of a literary movement,

trend, genre, or author of the period, as specified by the topic to be announced for each semester.

565-3 to 6 (3,3) Spanish American Literature of the 20th Century. Intensive study of a literary movement, trend, genre, or author of the period, as specified by the topic to be announced for each semester.

599-1 to 6 Thesis.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Forestry

Courses in this department may require the purchase of supplemental materials. Field trips are required for certain courses.

401-3 Fundamentals of Environmental Education. (See Agriculture 401.)

402-3 Wildland Hydrology. Fundamentals of hydrology as related to forest and wildland water resources will be emphasized. Considerations will include the hydrologic cycle with emphasis on soil and groundwater regimes, evapotranspiration, surface and subsurface runoff, and the quantity and timing of water yield. Prerequisite: Mathematics 140. Spring semester odd years.

405-2 Forest Management for Wildlife. Interrelations between forest practices and wildlife populations. Emphasis is on habitat requirements of different wildlife species and ways to manipulate the forest to improve wildlife habitats. Prerequisite: forestry major, or consent of instructor.

408-4 Introduction to Remote Sensing. The course is an introduction to the theoretical and practical considerations of remote sensing for an interdisciplinary audience. Coverage will stress background information about the electromagnetic spectrum, reflectance characteristics of various objects, sensors, filters, platforms and energy flow between object and sensor. Prerequisite: advanced standing or graduate status.

409-4 Forest Resources Decision-Making. Examines management planning decision-making for multiple-use forests particularly in the public sector. Reviews concepts useful for analyzing flow-resource problems, emphasizing systems approaches, introduces use of modern quantitative methods to evaluate resource use alternatives. Case studies. Prerequisite: 411, Mathematics 140.

410-3 Forest Resources Administration and Policy. Nature of administrative organizations and influences on behavior of organization members. Society influences causing changes in forestry related organizations. Policy formation and implementation, including roles of special interest groups.

411-3 Forest Resources Economics. Introduction to forest economics: Application of micro- and macro-economic principles to forest timber and non-timber production; capital theory; benefit-cost analysis; and economics of conservation. Prerequisite: Economics 215 or Agribusiness Economics 204; and Mathematics 140.

412-2 Tree Improvement. Basic theories and techniques of obtaining genetically superior trees for forest regeneration. Prerequisite: senior standing.

414-3 Information Management. The collection of physical, biological, and social variables in the field of forestry through sampling survey. The procedures of data manipulation and calculation and the presentation of graphs and tables.

416-3 Forest Resource Management. The application of business procedures and technical forestry principles to manage forest properties. Emphasis on integrated resource management for tangible and intangible benefits. Field trips and supplemental purchases approximately $25 for student. Prerequisite: summer camp or consent of instructor.

417-2 Forest Land-Use Planning. Principles of location theory as a basis for determining land use; supply of forest land; population pressure and demand; conservation principles; determination of forest land values; institutional factors influencing forest land-use; forest taxation; special taxes, and capital gains. Taught in alternate years. Prerequisite: 411 or consent of instructor.

418-2 Marketing of Forest Products. The role of marketing in the forest industries; review of economic principles; product policy, planning the product line, pricing, marketing channels, marketing programs, marketing organization, and marketing research as influences on the marketing of lumber, wood products, pulp, and paper. Taught in alternate years. Prerequisite: 411 or consent of instructor.

420-3 Park and Wildlands Management. The management of state and federal parks and recreation areas. A systems approach toward management and decision-making will be emphasized. Requires supplemental purchases of approximately $5 per student. Prerequisite: 320C.

421-3 Recreation Land-Use Planning. Principles and methods for land-use planning of park and recreation environments with emphasis on large regional parks. Focus on planning process and types of information to gather and organize. Application in group field projects. Prerequisite: 320, 420, or consent of instructor.

422C-4 Park and Wildlands Management Camp. A study of park conditions, visitors, and management practices at selected county, state, and federal park systems in the United States, including the federal wilderness preservation system. Course requires a field trip and supplemental purchases. Prerequisite: 320 and 320C and consent of instructor.

423-3 Environmental Interpretation. (See Agriculture 423.)

430-3 Wildland Watershed Management. Emphasis is placed on the principles, technical problems, procedures, alternatives, and consequences encountered in managing wildland watersheds for the production of quality water in harmony with other uses. Prerequisite: 331.

431-3 Regional Silviculture. Designed to evaluate the various silvicultural practices as they are commonly employed in various regions of the

United States. Offered alternate years. Prerequisite: 310C.

451-2 Natural Resources Inventory. Theory and practical problems in biometrics to obtain estimates of natural resource populations. Use of computers and other advanced techniques. Case studies of inventory procedures. Field trip cost — maximum $20. Prerequisite: 351 or consent of instructor.

452-2 Forest Soils. Characterization and fundamental concepts of forest soils and their relationships to forest communities and forest management practices. Emphasis is on the origin of forest soil material, soil forming processes, and the chemical, physical, and biological properties of soils as related to forests and forest management. Prerequisite: Plant and Soil Science 240 and concurrent enrollment in Forestry 452L. Spring semester even years.

452L-2 Forest Soils Laboratory. Companion laboratory for 452. Emphasis is on methods to characterize and evaluate the chemical, physical, and biological properties of forest soils. Prerequisite: Plant and Soil Science 240 and concurrent registration in Forestry 452. Spring semester even years.

453-2 Environmental Impact Assessment in Forestry. Methods of assessing the environmental impact of land-use systems on forest resources and assessing the impact of forest management systems on environmental quality are presented. Case studies culminating in the preparation of environmental impact statements are emphasized. Field trips cost, $20. Prerequisite: senior standing in a natural resource major.

454-2 to 8 Forest Ecology Field Studies. A study of forest communities, soils, and site conditions in one of the following ecosystems: **(a)** Boreal; **(b)** lake states; **(c)** Southern Appalachians; **(d)** Southern pine. Course requires a field trip of about 10 days. Each trip is two semester credits; a maximum of 6 credits may be applied toward graduate credit. Estimated cost $125.00 per trip. Prerequisite: senior standing in natural resources or biological sciences, courses in tree identification, forest ecology, and soils, and consent of instructor.

460-2 Forest Industries. Analysis of raw material requirements, the processes and the products of forest industries. The environmental impact of each forest industry will also be discussed.

470-2 Wilderness Management, Policy, and Ethics. Study of current management philosophy and practice in America's wilderness. Analysis of current wilderness policy and its historical evolution. Discussion of the evolution of the wilderness idea and the individuals that have influenced it. Weekend field trip required. Prerequisite: 320 or consent of instructor.

494-1 to 6 Practicum. Supervised practicum in a professional setting. Emphasis on administration, supervision, teaching and program leadership in community, school, park, forest, institution, and public or private agencies. Students should enroll according to their curriculum specialization: **(a)** Forest environmental assessment, **(b)** outdoor recreation resource management, **(c)** forest resources management. Prerequisite: consent of instructor.

500-2 Principles of Research. Research philosophy, approaches to research; theory, hypotheses inference, and predicting; problem identification, project development and organization; methods of data collection, analysis, and presentation; drawing conclusions and organizing results. Prerequisite: four hours in statistical methods or consent of instructor.

501-1 Graduate Seminar. Presentation and critiques of current research project of faculty, graduate student, and selected resource persons.

511-2 Advanced Forest Resources Economics. Application of microeconomic, macroeconomic, and capital theory to forest resource problems; introductory econometric methods; long range supply and demand projections; international forest economics and policy problems decision theory in forest resource management. Offered alternate years. Prerequisite: 411 or equivalent or consent of instructor.

512-2 Tree Selection and Breeding. Quantitative methods of describing variation patterns of trees, testing genetic and environmental effects and interactions, and evaluations of tree improvement program. Prerequisite: 412 or consent of instructor.

516-2 Advanced Forest Management. Case studies in forest land management, management planning, utilizing computer programming, CFI and TSI role in long range management planning. Offered alternate years—odd. Prerequisite: 416, 331, and summer camp or consent of instructor.

520-2 Advanced Park Planning. Study of nature and functions of the recreation environmental planning process in theoretical and policy terms. Types of plans at local, regional, and state levels. Evaluation of different types of planning approaches and their utility in particular situations. Offered alternate years. Prerequisite: 421 or consent of instructor.

521-2 Recreation Behavior in Wildlands Environments. Review of sociological and psychological theories relevant to outdoor recreation planning; management alternatives. Review of current behavior research in outdoor recreation. Application of behavioral concepts to recreation planning and administration. Offered alternate years.

530-2 Forest Site Evaluation. A discussion of the factors affecting site quality and their use in present site evaluation methods. Lectures will draw upon recently published scientific literature as well as forest research data collected and analyzed for southern Illinois forests. Laboratories will include sampling of forest sites and stands with subsequent analysis of data using graphic and statistical techniques and a computer to develop site evaluation models. Cost $20. Prerequisite: 300, BIOL 307 or consent of instructor.

531-2 Biological Productivity of Forests. The production and accumulation of organic matter in forest ecosystems is analyzed in relation to vegetational composition and structure, biogeochemical cycles, and environmental factors. Methods of quantifying productivity are emphasized during laboratory period. Cost: approximately $15. Offered alternate years. Prerequisite: 331 or equivalent.

588-1 to 6 International Graduate Studies. University residential graduate program abroad.

Prior approval by the department is required both for the nature of program and the number of hours of credit.

590-1 to 4 Readings in Forest Resources. Intensive consideration is given to current practices and problems in forestry. Prerequisite: consent of instructor.

593-1 to 4 Individual Research. Directed research in selected fields of forestry.

599-1 to 6 Thesis. Minimum of five hours to be counted toward a master's degree.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Geography

400-3 Geography of Outdoor Recreation. Analysis of patterns of outdoor recreation with an emphasis on metropolitan areas. Selected topics include demand forecasting methods, cost-benefit analysis and the valuation of recreation resources, and an analysis of the socioeconomic and spatial impacts of recreation facility provision.

404-3 Spatial Analysis. The purpose of this course is to equip the student with a series of perspectives and tools with which to view spatial phenomena. Emphasis is placed on methodological approaches to the analysis of areal distributions and phenomena. Longitudinal analysis of data is included. Prerequisite: 300. Geography 410 is advisable or consent of instructor.

406-2 Advanced Social Geography. Deals with one or more of the following: population, settlement, ethnic characteristics, political factors; depending on, and varying with, interests of the instructors. Thus, a student may register more than one time. Emphasis will be directed at familiarizing the student with techniques of analysis, and at developing concepts and principles that underlie understanding of the phenomena and their geographic significance. Prerequisite: 306 or consent.

410-4 Techniques in Geography. Geographic applications of basic and advanced statistical and mathematical techniques, including basic descriptive statistics, hypothesis testing, regression and correlation, analysis of variance, and nonparametric statistics. Special emphasis on areal measures: nearest neighbor analysis, etc. Prerequisite: 300 or consent.

416-4 Specialized and Computer Mapping. Introduction to computer mapping, mapping from air photos, specialized cartographic problems based on individual student interests. Laboratory. Charges not to exceed $2 for supplies. Prerequisite: 310 or consent.

418-3 Introduction to Geographic Information Systems. Introduces students to geographic information systems (GIS) for the collection, storage, analysis, and mapping of spatial data. A simplified GIS methodology makes the techniques available to students with no previous computer experience. Prerequisite: 304 and 310, or consent of instructor.

421-2 Urban Geography. Examination of extracity relationships — theory and structure; intra-city relationships — theory and structure, and selected urban problems. Offered once annually. Prerequisite: 300 or consent.

422-4 Economics in Geography and Planning. (Same as Economics 425.) Concepts, symbols, language, theory, and elementary mathematics of economics and geography. Individual's preferences, production functions, the firm, markets, optimality, externalities, and welfare economics. Elementary mathematics of time and intertemporal criteria. Prerequisite: 304 or consent of instructor.

424-4 Natural Resources Planning. Literature in resource management problems. Emphasis on theory, methods of measurement and evaluation concerning implications of public policy. The role of resources in economic development and regional planning, water and related land resource problems, and environmental quality from a multi-disciplinary perspective. Prerequisite: 304 or consent.

425-4 Water Resource Planning Simulation. A review of water resource planning theory and practice from a physical, technological, economic, social, and geographical viewpoint. Students design a comprehensive water resource plan including flood control, water supply, water quality, and recreation for a city of 175,000 population. This plan is "Played" against a 50-year trace of hydrologic parameters in a computer simulation. Prerequisite: 424 or consent.

426-4 Administration of Environmental Quality and Natural Resources. (Same as Political Science 445.) An examination of institutional arrangements and administrative practices in the protection and use of land, water, air, and mineral resources. The course includes analysis of responsibility and decision-making at all levels of government (federal, state, and local) as well as corporate, interest group, and individual responses to public programs. Particular attention will be given to administration of federal environmental quality legislation including the National Environmental Policy Act, the Clean Air Act, the Water Pollution Control Act, and the Surface Mining Reclamation Act. Prerequisite: 300 or 326, or consent of instructor.

427-3 Environmental Perception and Planning. Deals with a description and assessment of the relevance of normative and descriptive theories of decision-making and theories of choice for public policy and environmental management. Studies of the perception of urban environments and other landscapes such as wilderness areas, and perception of and human response toward natural hazards will be considered. Prerequisite: 300 or consent.

430-3 Environmental Systems Analysis. Exploration of the major environmental systems relevant to environmental planning. Topics include concepts of systems and system behavior; basics of systems analysis and modeling environmental systems; environmental fluxes of energy and materials (e.g., hydrologic cycle, carbon cycle, energy

budgets, erosion and sediment transport, role of biosphere in organizing fluxes); environmental variablility. Prerequisite: 302 or consent.

432-4 Physical Environments of Cities. Energy and moisture budget concepts are developed from basic principles. Microclimatic data, instrumentation and applications stress urban examples. Models of climatic effects and modeling of people's effects concern city climates mainly. Charge not to exceed $5 for field trips. Prerequisite: 302 or 430 or consent.

433-3 Advanced Physical Geography. Topics may include landforms, climate, soil or water. Varies with the interest of the instructor. Prerequisite: 302 or consent.

434-4 Water Resources Hydrology. Microclimatic factors which affect the hydrologic events of various climatic regions are treated extensively. Methods of estimating geographic variations in hydrologic relations to climatic and microclimatic especially evapotranspiration, are compared and evaluated. Consequences of alternative land uses on climate and hydrology are considered regionally. Charges are not to exceed $10 for field trips. Prerequisite: 302 or 430 or consent.

435-3 Solar and Alternate Energy Planning. Regional and national strategies for energy supply and demand are reviewed followed by a study of current energy resources, reservoirs, and the range of demands and environmental impacts. Community and national planning strategies for increasing the use of solar and alternate energies are explored, simulated by analog computer, and assessed for present and future implementation probability. Field trip expenses not to exceed $10. Prerequisite: 300.

436-3 Environmental Disaster Planning. Develops the skills and perspectives needed to plan effectively for natural and man-made disasters. The concepts of risk analysis, hazard mitigation and preparedness, response and recovery of the economic and social infrastructure in areas impacted by earthquakes, floods, droughts, radioactive and toxic material releases, and other catastrophic events.

438-3 Applied Meteorology. Analysis of meteorological patterns approached through study of several case histories. Evaluation of meteorological data, air mass and frontal analysis, development of weather forecasts, study of meteorological instruments, clouds, and precipitation patterns. Charges not to exceed $5 for field trips. Prerequisite: GEA 330 or consent of instructor.

439-3 Climatic Change — Inevitable and Inadvertent. The geologic time-scale perspective of major natural events that have affected the theoretical steady-state climate, and factors in contemporary societal practices that have brought about inadvertent climatic modification. An assessment of the means and extremes of parameter values in the geologic time-scale perspective studied will be compared with the documented and present-day climatic parameter means and extremes. Approaches to prognoses for the Earth's future climatic state will be made. Charges not to exceed $10 for field trips. Prerequisite: GEA 330, GEOG 331 or consent of instructor.

440-2 Tutorial in Geography. Prerequisite: geography major, senior standing.

443-3 Teaching of Geography. Presentation and evaluation of methods of teaching geography. Emphasis upon geographic literature, illustrative materials, and teaching devices suitable to particular age levels. Charges not to exceed $3 for field trips. Prerequisite: 300.

470-1 to 5 (3, 1 or 2) Urban Planning. (a) Planning concepts and methods. (Same as Political Science 447a.) Charges not to exceed $8 for field trips. **(b)** Field problems. (Same as Political Science 447b.) Concurrent enrollment in 470a is optional. Prerequisite: 326 or 421 or consent of instructor.

471-3 Environmental Impact Analysis. Techniques of assessing the impact of human activities on the environment, including weighting schemes, cost-benefit analysis, linear programming, ecological impact assessment. Emphasis is on placing NEPA and EIS writing in legal, economic, and environmental perspective. Prerequisite: 302 or 304 or consent.

480-3 to 6 Internship in Geography. Supervised field work in private or public organization dealing with planning, environmental management, or cartography and geographic information management. A written proposal about the planned internship must be submitted to a faculty supervisor prior to beginning of internship. A faculty supervised report on the work is required after the internship. Courses may be repeated, but no more than 3 credit hours may be applied to an undergraduate major. A graduate student may enroll for 3 credit hours. Prerequisite: geography major and consent of department.

481-6 to 12 Cooperative Work Experience in Geography. Placement of advanced undergraduate or graduate student in private or public organization for one or more semesters in paid career-related position. Student gains professional experience, under faculty and on-site supervision. A written proposal about the planned cooperative work experience must be submitted to a faculty supervisor before it begins. A report summarizing the work experience is required after the work experience ends. Course may be repeated. Three credit hours may apply toward requirements for a Geography major; three additional credit hours may apply toward degree requirements as elective. Prerequisite: geography major and consent of department.

490-2 to 4 Readings in Geography. Supervised readings in selected subjects. Prerequisite: geography major, advanced standing.

500-2 Principles of Research. Problem identification in research, review of examples of geographic research, analysis of results of research and project statements are explored with appropriate faculty. Presentation of student research problems justification and identification of student program to complete degree are required.

501-2 Seminar in Geographic Research. Seminar approach to problems of completing background research design of project statements, identification of research methodology, and completion of thesis/dissertation project statements. Prerequisite: 500.

510-4 Multivariate Techniques in Geography. Introduction to matrices, vectors and linear equations; multiple regression and correlation, cononical correlation, multivariate analysis of

variance and covariance, analysis of variance in two- and three-way designs, multiple discriminant analysis, classification procedures, introduction to elementary factors analysis. Examples and demonstrations of each method; basic introduction to computer applications of multivariate analyses. Prerequisite: 410 or consent of instructor.

511-2 Philosophy of Geography. The nature of geography. Current trends in the field, present day geographers, and schools of thought. Geography's place among the disciplines. Prerequisite: graduate standing.

514-2 College Teaching of Geography. Prerequisite: graduate standing.

520-2 to 4 Seminar in Physical Systems Evaluation. Prerequisite: graduate standing.

521-2 to 4 Seminar in Resource Planning. Prerequisite: graduate standing.

522-4 Seminar in Economics in Geography and Planning II. (Same as Economics 525.) Public expenditure criteria based on free-market allocation, public, private, and merit goods and services, and related planning; expenditure criteria based on comprehensive plans; expenditure criteria and planning in the absence of general optimality; multiple objectives, measurement of benefits and costs, shadow prices, choice of techniques in planning; consideration of uncertainty. Critical evaluations of applied work and models of development projects, and programs, by students. Prerequisite: 422 or consent of the instructor.

524-2 to 4 Seminar in Social Geography. Prerequisite: graduate standing.

527-2 to 4 Seminar in Urban and Regional Planning. Prerequisite: graduate standing.

570-2 to 4 Planning Internship. Planning internship with city or regional planning agency or private planning firm. Prerequisite: 470a or consent of department.

591-2 to 4 Independent Studies in Geography. Prerequisite: graduate standing.

593A-2 to 24 (2 to 6 per semester) Research in Physical Geography. Prerequisite: 520.

593B-2 to 24 (2 to 6 per semester) Research in Economic Geography. Prerequisite: 521.

593C-2 to 24 (2 to 6 per semester) Research in Urban and Regional Planning. Prerequisite: graduate standing.

593D-2 to 24 (2 to 6 per semester) Research in Social Geography. Prerequisite: 524.

596-2 to 4 Field Course. Prerequisite: graduate standing.

599-2 to 6 Thesis. Prerequisite: graduate standing.

600-1 to 32 (1 to 16 per semester) Dissertation. Prerequisite: graduate standing.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Geology

Courses with a laboratory may require purchase of a laboratory manual and a supply fee. All courses requiring field trips may have a field trip fee of $2 to $7.

412-3 Topics in Igneous Petrology and Geology. In-depth studies of selected topics in igneous petrology and igneous geology. The selected topics will emphasize theoretical considerations, experimental considerations, and field associations of a variety of igneous rock types. Lecture, discussion sessions, and laboratory. Prerequisite: 315, 415.

413-3 Quantitative Methods of Geology. An introduction to quantitative methods in a geological and earth sciences context. Topics introduced include sampling plans for geologic studies, nonparametric test of geological data, comparisons of geological samples, analysis of sequential geological data. Laboratories will deal with numerical examples from all areas of geology. Prerequisite: advanced standing and consent of instructor.

414-3 Paleobotany. (See Plant Biology 414.)

415-3 Optical Mineralogy. The optical properties of minerals and the use of the petrographic microscope for identification of crystals by the immersion method and by thin section. Lecture, laboratory. Prerequisite: 310, Physics 203b or 205b.

416-3 X-ray Crystallography. (Same as Chemistry 416.) Introduction to the study, measurement, and identification of unknown crystalline materials by X-ray diffraction techniques (especially the Debye-Scherrer methods). Upon request, non-geology majors may work with unknowns from their own fields of study. Prerequisite: 310, Mathematics 150 or consent.

417-3 Isotope Geochemistry. Stable and radioactive isotopes and the applications of isotopic studies to igneous and metamorphic petrology, ore deposits, sedimentology, surface processes, geothermometry, and geochronology. Introduction to isotopic techniques and mass spectroscopy. Laboratory or research project required. Prerequisite: 310, 315, and 325 or consent. Recommended: Physics 203, Mathematics 150, and Geology 419.

418-3 Low Temperature Geochemistry. The application of chemical principles to geologic processes that occur on and near the earth's surface. Lecture, laboratory. Prerequisite: 310, Chemistry 222 or equivalent.

419-4 Ore Deposits. The geological and other factors that govern the exploration for and occurrence of metalliferous mineral deposits. Study of the geological settings of the major types of ore deposits. Lecture, laboratories, and field trips. Prerequisite: 302, 315.

420-3 Petroleum Geology. The geological occurrences of petroleum including origin, migration, and accumulation; a survey of exploration methods, and production problems and techniques. Laboratory study applies geological knowledge to the search for and production of

petroleum and natural gas. Prerequisite: 221, 302.

421-3 Organic Geochemistry. The nature, origin and fate of natural and artificial organic materials in rocks and sediments. Topics include characterization of fossil fuels using biological marker compounds, petroleum source rock evaluation, and organic pollutants in the environment. Prerequisite: 325 or consent of instructor.

425-4 Invertebrate Paleontology. Principles of paleontology and a survey of the important invertebrate phyla and their fossil representatives. Laboratory. Field trips required. Prerequisite: 221, a biology course.

428-3 Paleoecology and Environments of Deposition. Characteristics, distribution, and classification of recent and ancient environments. Criteria for recognizing ancient environments. Sedimentological and paleoecological approaches. Recognition of ancient environments and environmental associations. Laboratory. Field trips required. Prerequisite: 425, 325, or concurrent enrollment.

430-3 Physiography of North America. A regional study of North American landforms and their origins. The approach designed to give interaction among students, stimulus in organization and presentation of material and library competence. Plan a trip for optimum view of North American physiography. Prerequisite: 220.

434-3 Volcanology. Volcanic processes and products. Topics include magmas, eruptive styles and mechanisms, lava flows, pyroclastic deposits, volcano morphology, monitoring and prediction techniques. Prerequisite: 220, 315, and advanced-standing.

435-3 Solid-Earth Geophysics. Earth's size, shape, mass, age, composition, and internal structure are reviewed in detail as understood from its volcanism, gravity and magnetic fields, seismicity, and motion of continents and ocean basins; plate tectonics. Prerequisite: 302, Mathematics 150, or consent of instructor.

436-4 Elementary Exploration Geophysics. Theory and practice of geophysics as applied to the exploration and development of natural resources. Laboratory involves use of geophysical instruments and interpretation of data. Field trips required. Prerequisite: 220, Mathematics 150.

437-3 Field Course in Geophysics. Use of geophysical equipment for collection, analysis and interpretation of seismic, gravity, magnetic, electrical, and other types of geophysical data. Prerequisite: 436 or consent.

440-1 to 4 Advanced Topics in the Geological Sciences. Individual study or research or advanced studies in various topics. Prerequisite: advanced standing and consent of instructor.

445-3 Museum Studies in Geology. History, nature and purpose of geology in museums, relationships of geology to other museum disciplines, application of geologic methods to museum functions, preparation and preservation of specimens; nature, acquisition and utilization of geologic collections in museums, role of research in museums.

450-2 Introduction to Field Geology. Introduction to field techniques, principles of geologic mapping and map interpretation. Field trip fee $5.00. Prerequisite: 302, 315 or concurrent enrollment.

454-6 Field Geology. Advanced field mapping in the Rocky Mountains, including problems in stratigraphy, structure, petrology, paleontology, geomorphology, and economic geology. Transportation cost approximately $150, supplies $6. Prerequisite: 302, 315; 450 recommended.

455-3 Engineering Geology. (Same as Engineering 455.) An examination of problems posed by geology in the design, construction, and maintenance of engineering works. Topics studied include ground water, land subsidence, earthquakes, and rock and soil mechanics. Two term papers and a field trip required. Prerequisite: 220 or consent.

460-3 Geological Data Processing. Computer applications to geological problems including the processing and programming of data and the interpretation and evaluation of results. Lecture, laboratory. Prerequisite: Engineering 222 or Computer Science 202.

462-3 Fundamentals of Structural Geology II. Intermediate topics in structural geology including strain theory, field strain analysis, geometry of complex mesoscopic structures and introduction to dislocations, deformation history, and microfabric analysis. Hypotheses and orogenesis are discussed and evaluated. Lecture and assigned problems only. Prerequisite: 302 or equivalent.

466-3 Tectonics. Fundamentals of geodynamics applied to plate tectonics: mantle composition and rheology, deformation of the lithosphere, structural characteristics of plate margins, stability of triple junctions, diachronous tectonics, and orogenesis will be examined in detail. Prerequisite: 302, Mathematics 150, or consent of instructor.

470-3 Hydrogeology. A problem-solving oriented course which covers the analysis and interpretation of the distribution, origin, movement, and chemistry of ground water. Laboratory. Prerequisite: 220, Mathematics 250.

474-3 Geomorphology. Study of erosional and depositional processes operating at the earth's surface and landforms resulting from these processes. Relationship of processes and landforms to the geologic framework is examined. Laboratory. Prerequisite: 220.

476-3 Pleistocene Geology. Deposits, stratigraphy, and history of the Pleistocene Epoch. Evidence for differentiating and dating the glacial and interglacial sequence examined including deep sea cores, soils, magnetic studies. Required field trips. Prerequisite: 220, 221.

478-4 Environmental Geology. Application of principles of geomorphology to the understanding of environmental problems and geologic hazards. Emphasis on environmental problems related to soils, mass movements, rivers, flooding, waste disposal, groundwater, and coastal processes. Lectures, case studies, and seminars will focus on special problems. Laboratory exercises deal with techniques for assessing environmental hazards (i.e., slope hazards, soil descriptions, flood frequency, and surface water hydrology). Prerequisite: 220 and 474.

480-3 Geology of Coal. Geology as related to exploration, development and mining of coal; stratigraphy, sedimentation and structure of coal

deposits; type of coal basins and their tectonic setting; concepts of cyclical deposition in coal basins; origin of splits and partings in coal seams; relationship of modern environments and ancient coal-forming environments; structural problems relevant to exploration and mining of coal; methods of resource evaluation. Three 1-hour lectures/week; five 1/2 day field trips.

481-3 Sedimentary Basin Analysis. The use of stratigraphy, structure, sedimentology and geophysics to determine the paleogeographic evolution of sedimentary basins. Topics include the study of the relationships between host strata and both primary and post-depositional non-renewable resources, plate tectonics and basin evolution and subsurface geologic methods. Prerequisite: consent of instructor.

482-3 Coal Petrology. Structural features and microscopy of coal seams. Origin and alteration of coal constituents. Includes field trips, study of coal specimens, and techniques. Prerequisite: 220 and 221 or consent of instructor.

484-3 Palynology. (Same as Plant Biology 484.) Taxonomy, morphology, stratigraphic distribution, and ecology of fossil pollen, spores, and associated microfossils. Prerequisite: 220, 221, or consent of instructor.

500-1 to 2 Teaching for Geology Graduate Students. To help teaching assistants develop skills in conducting laboratory work and leading discussions. One hour required for all teaching assistants in geology. Graded *S/U* only.

510-2 Advanced Sedimentology. Basic principles of field observation, field and laboratory sampling, and data analysis of clastic sedimentary rocks; introduction to laboratory techniques; introduction to statistical, physical, and empirical models in sedimentary geology. Field trips required. Prerequisite: 325 or 474.

515-3 Instrumental Analysis in Geology. An introduction to modern methods of instrumental inorganic geochemical analysis that are particularly important in the geology sciences. This includes both operational theory and practical application of methods for the analysis of minerals, rocks, and aqueous solutions. Lecture, laboratory. Prerequisite: 310, CHEM 222 or equivalent, and consent of instructor; 418 recommended.

517-2 to 9 (2 to 6 per semester) Advanced Topics in Geochemistry. Specialized topics in geochemistry. Topics covered might include thermodynamic modeling of mineral-solution equilibria, the role of kinetics in mineral-solution reactions, experimental hydrothermal geochemistry, or other topics to be announced by the department. Maximum credit 9 semester hours. Prerequisite: 418 or consent of instructor.

518-3 Clay Mineralogy. Study of the structure, chemistry, origin, and geologic importance of clay minerals. Industrial and other applications of clays. Lecture, laboratory. Prerequisite: 310 or consent.

520-2 to 9 (2 to 6 per semester) Advanced Topics in Igenous and Metamorphic Petrology. Petrologic principles and their relationships and other selected topics to be announced by the department. Prerequisite: consent of instructor.

522-3 Sedimentary Petrology—Siliciclastics. The petrography and petrology of siliciclastic rocks, emphasizing sandstones. Microscopic studies of composition and components of detrital clastic rocks, their origin, provenance, characteristics, diagenesis, cementation, and lithification. Prerequisite: 325 or 415 or consent; 520 or 521 recommended.

523-3 Sedimentary Petrology—Carbonates. The origin, classification, diagenesis, and geochemistry of carbonate rocks, with emphasis on petrographic analysis. Study of recent carbonate depositional environments. Laboratory required. Prerequisite: 325, 418 recommended.

524-2 to 9 (2 to 6 per semester) Advanced Topics in Sedimentary Geology. Advanced topics in sedimentary geology. Topics may include clastic depositional environments, carbonate depositional environments; diagenesis of sedimentary rocks, and other topics to be announced by the department. Prerequisite: 428, or 522, or 523, or consent of instructor.

525-2 to 6 (2 to 3 per semester) Advanced Topics in Invertebrate Paleontology. Lectures, readings, field and laboratory studies, including techniques and quantitative methods of study. Preparation for research in paleontology. Topics may include corals, bryozoans, brachiopods, mollusks, echinoderms, biostratigraphy, tempo and mode of invertebrate evolution, and other topics to be announced by the department. Maximum credit 6 semester hours. Prerequisite: 425 or consent of instructor.

526-3 Advanced Topics in Applied Paleoecology. Lectures, field, and laboratory studies, including techniques and quantitative methods. Preparation for research in paleoecology. Emphasis on using fossil marine invertebrates and trace fossils to interpret ancient sedimentary environments. Prerequisite: 428 or consent.

527-3 Micropaleontology. Structure, classification, paleoecology, stratigraphic distribution, and evolution of microfossils. Laboratory work in techniques of collection, preparation, and study of microfossils. Identification and use of microfossils in solving stratigraphic problems. Preparation for research in micropaleontology. Prerequisite: 425 or consent.

535-1 to 9 (1 to 6 per semester) Advanced Topics in Geophysics. Specialized topics in geophysics. Examples include but are not limited to seismic stratigraphy, mid-continent seismicity, isostacy, data processing techniques. The topic to be covered is announced by the department. Maximum credit 9 semester hours. Prerequisite: 435 or 436 or consent of instructor.

536-3 Earthquake Seismology. Observational seismology. Topics include earthquake source mechanisms; propagation, reflection and refraction of elastic waves; ray theory; dispersion of surface waves; the effect of earth structure on the seismogram; and the seismograph. Research projects will be conducted using data from the SIU Geophysical Observatory. Prerequisite: 435 or 436, MATH 150, or consent of instructor.

537-3 Applied Seismology. Study of the seismic reflection techniques, including theory and methods of collection and analysis of seismic reflection data, the seismic method, waveform analysis, and digital filtering with computer applications and seismic instrument characteristics. Prerequisite: MATH 150 or consent.

538-6 (3,3) Gravity and Magnetism. **(a)** Gravity. Study of gravitational methods used in the solution of geological problems; topics include theory, field operations, data reduction, anomaly separation, two and three-dimensional analysis, and interpretation. **(b)** Magnetism. Study of magnetic methods used in the solution of geological problems; topics include theory, origin, time variations and induction, paleomagnetism, magnetic properties of earth materials. Field operations, anomaly separation, and interpretation. Prerequisite: 435 or 436, MATH 150, or consent of instructor.

565-3 Rock Deformation and Structural Systems. Advanced topics in structural geology with emphasis on theoretical and experimental study of rock deformation and analysis of complex structural systems. Lecture and assigned problems only. Prerequisite: 462.

566-3 Advanced Topics in Structural Geology. Lectures, readings, and discussion of advanced aspects of rock deformation: dislocation theory and its applications to flow processes of rocks; experimental rock deformation; incremental and finite strain theory and analysis; and recent developments in structural geology. Prerequisite: 565.

570-3 Advanced Hydrogeology. A combination of lectures, seminars, and independent studies of advanced topics in hydrogeology, particularly geochemistry and the response of aquifers to stresses such as tides, recharge, and saline intrusion. Prerequisite: 470.

576-3 The Coastal Environment. Geomorphology, sedimentary processes, and deposits in the coastal zone. Emphasis on coastal processes, depositional environments, barrier islands, coastal erosion, and environmental/engineering problems. Includes special seminars focusing on current research problems, storms, nearshore sediment dynamics, sea level, Great Lakes, salt marshes. Texas coastal atlas, and coastal zone management. A research project and a several-day field trip are required. A cost of $25 may be incurred by the student for the field trip. Prerequisite: 474 or consent of instructor.

577-2 to 9 (2 to 6 per semester) Advanced Topics in Surfical Geology. Studies of processes, landforms, and deposits in the surface or near surface geologic setting. Selected topics to be announced by the department. Maximum credit nine semester hours. Prerequisite: consent of instructor.

578-3 Fluvial Geomorphology. Detailed study of river processes, landforms, and major concepts related to geology. Flood, drainage basin analysis, and hydraulic geometry. Prerequisite: 474.

582-1 to 6 (1 to 3 per semester) Advanced Coal Petrology. Microscopy, source materials, coalification, constitution, and classification of peats, lignites, bituminous coal, anthracite; applications to industrial problems. Prerequisite: 482.

591-1 to 6 Individual Research in Geology. Investigations in geology other than those for theses or dissertations.

599-1 to 6 Thesis. Minimum of three hours to be counted toward a master's degree.

600-1 to 30 (1 to 16 per semester) Dissertation. Research for and writing of the doctoral dissertation. Prerequisite: consent of instructor.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Health Education

400-2 to 15 (2 to 3 per part) Health Appraisal of School Children. **(a)** General assessment. **(b)** Hearing conservation. **(c)** Vision training. **(d)** Spinal screening program. **(e)** Special topics. Includes the screening, testing, and evaluation for numerous health conditions related to hearing, vision, the cardiovascular system, skin, spine, and such diseases as diabetes, tuberculosis, herpes, and other such ailments. Included will be classroom lectures and presentations, a supervised practicum, and all students will develop a viable program in a particular problem area in a public school program.

401-3 Epidemiological Approaches to Disease Prevention and Control. Principles and practices in the cause, prevention, and control of diseases in various community settings.

402-3 Death Education. Designed to prepare educators to conduct learning experiences about death and dying in a variety of school, college, medical care, and community settings. Stress will be placed on developing brief, functional curricula and usable, imaginative teaching-learning materials, and on evaluating resource materials for use in educating at various levels of maturity.

403-3 Health Advocate Training. Provides students with knowledge and skills in the areas of peer health education, health advocacy, and referral. Instruction includes health care information from a wellness point of view. Prepares students for practicum in health advocate program. Credit will not count toward a master's degree in health education. Prerequisite: consent of instructor.

405-3 Sex Education. Examines various programs of sex and family life education in schools, recognizing a range of community attitudes.

406-3 A Seminar: The Health Professional and Human Sexuality Issues. Human sexuality issues which must be dealt with by professional health workers including nurses, physicians, patient educators, institutional supervisors, and other administrators are considered in the course and current approaches and solutions for questions raised by these issues are examined.

407-3 Drug Education. Meets requirements of Illinois state law for education concerning drugs including alcohol for grades K-12. Explores motivations behind use and abuse of drugs. Offers experiences in development of curriculum and teaching approaches and material.

410-3 Human Sexuality. Provides detailed in-depth information on such topics as philosophical views of sexual behavior, sex techniques, sex therapy, sexual variations, sexual anatomy and physiology, including the sexual response and

changes with age and sexual development in childhood.

411-6 Emergency Medical Technician in the Wilderness. Placement of trained emergency medical technicians into a wilderness situation and having them adopt previously learned skills and newly developed skills. Prerequisite: 310 or 434.

430-3 Health and Injury Control in A Work Setting. (Same as Industrial Technology 430.) Assesses the health and injury control programs present in a work setting. Emphasis given to employee programs in health, wellness, and injury control that are effective. Field trips to work sites are included.

434-4 Advanced First Aid and Emergency Care. Meets the needs of those in positions where a complexity of first aid emergency care procedures are needed. American Red Cross and American Heart Association certification may be obtained. Materials purchased from the American Red Cross and/or the American Heart Association are required in this course. Consent of instructor required.

440-3 Health Issues in Aging. Students enrolled in the course will be involved in a wide variety of learning activities focusing on health needs of the elderly. The course is designed for students who have a special interest in health implications of aging.

441-3 Women's Health. The course deals with a wide variety of health concerns of American women as consumer in the current health marketplace. Major categories of topics include health products, health services, and sources of health information of particular interest to women. Emphasis is also placed on current health related issues of women. The major purpose of the course is to provide a basis for informed decision-making by the female consumer.

442S-5 Driver and Traffic Safety Education — Practicum. Provides prospective teachers with simulation, range, and on-road teaching experience with beginning drivers. Students may be required to purchase materials not to exceed $15. Prerequisite: 302S.

443S-3 Driver and Traffic Safety Education — Program Administration. Emphasizes administration, reimbursement, scheduling, public relations, planning, and evaluation of driver education. Prerequisite: 442S or consent of instructor.

444-3 Modern Gerontology. (Same as REHB 405) This multidisciplinary course in Gerontology is a survey of various disciplines which contribute to a body of knowledge vital to working, performing research, and teaching in an aging society.

445-3 Advanced Driver Education Instructor Training. Prepares prospective instructors of advanced driving techniques. Emphasis is placed upon safe driving practices, vehicle dynamics, emergency vehicle operation, in-car response to simulated driving emergencies, and instructional techniques. Prerequisite: consent of instructor.

446-4 Motorcycle Rider Education Instructor Training. Provides prospective teachers with on-cycle teaching experience with beginner riders. Addresses program administration, scheduling, public information techniques, equipment procurement, evaluation and instructional technology. Certification as Motorcycle Rider Course Instructor can be obtained. Materials purchased from the Motorcycle Safety Foundation are required in this course. Prerequisite: consent of instructor.

450-3 Health Programs in Elementary Schools. Orientation of teachers to health programs and learning strategies. Designed for elementary education majors.

455-3 Computer Applications in Health Education. Designed for students with little or no previous experience with computers. The course will be applications oriented, with an introduction to the potential uses of computers in the field of health education.

460-3 Health Programs in Secondary Schools. Orientation of teachers to health programs and learning strategies. Designed for secondary education majors. Open to non-health education majors only.

461-1 to 12 Health Education Workshop. A different focal theme each year; e.g., mood modifying substances, ecology, human sexuality, emotional and social health dimensions. Information, ideas, and concepts are translated into teaching-learning materials and approaches; continuing opportunity for interaction between prospective and experienced teachers.

470S-3 Highway Safety as Related to Alcohol and Other Drugs. Relationship between alcohol and other drugs and traffic accident causes. A review of education programs designed to minimize drug related accidents. Prerequisite: advanced standing or consent of instructor.

471-2 Health Education Instructional Strategies. This course is designed for graduate students who are teaching assistants in the Department of Health Education. The purpose of the course is to enhance professional skills of those who are responsible for teaching health education, general education, and first aid.

475S-3 Traffic Law Enforcement and Planning. Acquaints safety and driver education teachers and highway safety personnel with purposes of traffic law enforcement and engineering, and methods used to fulfill these purposes. Emphasis is placed upon ways of improving existing services and coordinating efforts of official and non-official agencies concerning traffic problems. Prerequisite: 302S or consent of instructor.

480S-3 Traffic and Driver Education Program Development. Acquaints students with curriculum innovation, current philosophy, learning and teaching theories, and instructional designs. Students will develop learning packages and modules. Prerequisite: 443S or consent of instructor.

481S-3 Traffic and Safety Education — Evaluation Techniques. Emphasizes method of evaluation as applied to traffic and safety education programs. Prerequisite: 480S or consent of instructor.

483-3 Community Health Administration in the United States. Background and development of community health administration structures in the United States; the dynamics and trends evolving from current health and medical care programs and practices.

485-3 International Health. Health beliefs, values, and practices of peoples in various cultures as related to a total way of life of potential

value to both prospective teachers and students in other fields.

488-3 Environmental Dimensions of Health Education. Application of the principles of learning to understanding people interacting with their environment. Emphasis placed upon individual and community responsibilities for promoting environmental health. Rural and municipal sanitation programs and practices are included.

489-3 Introduction to Vital Statistics. An introduction to bio-statistics; examination of theories of population projections; collection, organization, interpretation, summarization, and evaluation of data relative to biological happenings with emphasis on graphic presentation.

490-2 to 6 Field Experiences in School, Community Health or Safety Education. Field observation, participation, and evaluation of current school or community health education or safety programs in agencies relevant to student interests. Prerequisite: consent of instructor.

491-3 Health Teaching/Learning: School and Community. Teaching and learning strategies at secondary school levels and in other community group settings. Opportunities to examine and observe a variety of educational strategies applicable to health education.

495S-3 Driver Education for the Handicapped. Methods and techniques in the use of assistive equipment and program materials for teaching handicapped persons how to drive. Prerequisite: advanced standing or consent of instructor.

496-4 Industrial Hygiene. Provides a background in the recognition, evaluation, and control of toxic materials and hazardous physical agents in the work environment. Prerequisite: consent of instructor.

499-3 Rx: Education in Health Care Settings. Designed for members and potential members of the health care team to explore educational concepts and strategies applicable to a variety of health care settings. Includes rights and responsibilities of consumer and professional, determinants of health behavior, contrasting models of health care, communication skills, media and materials and planning, implementing and evaluating educational programs. Open to medical and dental personnel, nurses, health educators, dieticians, therapists, pharmacists, social workers, and related professionals.

500-3 Community Organization for Health Education. Theory and practices in community organization for health education; group work methods and leadership theories are explored. Field observations required.

510-3 Curriculum in Health Education. Analyzes the significance of current trends in curriculum theory and design; develops objectives, content, learning approaches, resource teaching-learning materials; and evaluation as components of a curriculum guide.

511-3 Health Education Conference Practicum. A summer practicum course taken in conjunction with 461, 462, or 463. Participants help plan the conference, analyze activities, suggest alternatives, assume leadership responsibilities, prepare conference proceedings, and design a comparable experience with another focal theme. Prerequisite: consent of instructor.

515-3 Review of Current Literature in Health Related Fields. Develops a broad philosophical framework for health education and safety education, examining a variety of professional materials for their relevance to such a framework. Reading, reporting, discussing, and interacting in relation to issues of contemporary and future concerns by conceptualizing health as a process in the realization of individual and societal goals.

520-3 Special Projects in Health Education. Study of problems in health education and safety education culminating in a research paper.

526-3 Evaluative Approaches to Health Education. Survey and analysis of health testing and evaluation procedures, uses and limitations of knowledge and attitude tests, behavioral inventories, check lists, questionnaires, interviews, and other techniques.

530S-3 Research in Traffic Safety. A study of unique problems related to traffic safety and a review and evaluation of contemporary studies. Prerequisite: graduate standing or consent of instructor.

533A-4 Foundations of Health Education I. Historical and philosophical foundations of health education dealing with principles of the discipline and preparation for services as a professional. Consideration of theoretical models of health and health education, professional ethical issues, and future directions.

533B-4 Foundations of Health Education II. Health education programs and program development and the interrelation of these with research and evaluation. Consideration is given to ethical, legal, and political issues affecting health education. Prerequisite: 533a or consent of instructor.

536-3 Professional Preparation in Health Education. Considers national, state, and local factors influencing professional preparation, accreditation, and certification processes. Emphasis upon influences of official and non-official agencies. Historical perspective, the present status, and future directions of the profession.

540-2 Health Facilities Management. An examination of planning approaches for health facilities and licensure, accreditation and certification, and various operational considerations for health facilities.

541-3 Issues in Health Care. Examination of current and continuing issues in the provision, administration, financing, and regulation of health care services. Prerequisite: 483 or consent of instructor.

550S-3 Current Developments in Traffic and Safety Education. Current problems, trends, and research studies in traffic and safety education are reviewed, critiqued, and evaluated.

555S-3 Traffic Safety Management. Course deals with highway safety legislation and other acts related to traffic safety. Application of safety management techniques, procedures and structure of federal and state agencies are emphasized. Prerequisite: consent of instructor.

572-3 Coordination and Supervision of School Health and Safety Programs. For advanced students who will have leadership responsibilities in planning, implementing, and coordinating comprehensive health and safety educa-

tion programs at all levels from preschool through junior colleges. Cooperative relationships among teaching, administrative, and supervisory personnel with community groups will be stressed.

590-8 Practicum in Community Health. Students are assigned full-time to a community health agency for experiences in health education. Restricted to those specializing in community health.

592-8 Practicum in Safety and Industrial Health. Students are assigned full-time to a safety agency or industry for experience in either safety or industrial health. Restricted to those specializing in safety industrial health. Prerequisite: consent of instructor.

597-2 (1,1) Seminar in Health Education. Advanced graduate students discuss individual health projects and present research problems. Each will present a dissertation prospectus.

598-3 Institute: Writing Research Proposals. Consideration is given to funding sources, proposal guidelines, procedures for support, budgetary requirements, and evaluation procedures. Students examine different types of funded projects, develop a research prospectus, and analyze the art of grantsmanship and political action.

599-1 to 6 Thesis.

600-1 to 32 (1 to 16 per semester) Dissertation.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Higher Education

(See Educational Administration and Higher Education.)

History

411-3 Ancient Greece. The history and culture of ancient Greece. The approach is interdisciplinary, with readings drawn from ancient historians, documents, and inscriptions. The lectures will make use of the visual evidence, including architectural remains and archaelogoical artifacts.

412-3 Ancient Rome. The history and culture of ancient Rome. The approach is interdisciplinary, with readings drawn from ancient historians, documents, and inscriptions. The lectures will make much use of the visual evidence, including architectural remains and archaelogical artifacts.

413-6 (3,3) Medieval Society. **(a)** The Early Middle Ages. A.D. 400-1000;**(b)** The Late Middle Ages, A.D. 1000-1400. An examination of the distinctive elements of medieval European civilization. The first semester will consider the transition from ancient to medieval society and the gradual development of a new social and economic regime. The second semester will be devoted to a study of the full development of that new regime, its flowering in the 13th century and the crisis of the 14th century.

418-3 Renaissance. The focus on the Renaissance in Italy and in particular on its relation to the social and economic context in which it developed. The spread of humanism and humanistic values to other areas of Europe will also be considered.

420-3 Reformation. Concentrates on the movement of religious reforms in the 16th Century. Emphasis on its roots in the past, particularly in earlier expressions of popular piety and to the wider social and political effects in the 16th and 17th centuries.

421-6 (3, 3) Absolutism and Revolution: Europe 1600-1815. **(a)** 1600-1715; **(b)** 1715-1815. The development of enlightened despotism, the rise of the revolutionary movement, and the Napoleonic period.

422-6 (3, 3) Intellectual History of Modern Europe. **(a)** 1600-1815; **(b)** Since 1815. The first semester will cover the Age of Reason, the Enlightenment, and Early 19th Century Romanticism. The second semester will cover the period from Marx and Darwin to the Contemporary World.

423-3 Diplomatic History of Modern Europe. A study of the European state system and the diplomacy of the major powers, with emphasis on events since 1870.

424-6 (3, 3) Social and Revolutionary Movements in Nineteenth Century Europe. **(a)** 1815-1871; **(b)** 1871-1914. Changing social and political structure of Europe caused by the impact of industrialization and the French Revolution. The consequences of these developments in terms of the emergence of new social forces and the development of movements for social and political revolution.

425-6 (3, 3) Twentieth Century Europe. **(a)** Era of the World Wars; **(b)** Since 1945. Political, social, cultural and economic development of the major European states during the present century.

432-3 History of France. Social, economic, political, and intellectual evolution from medieval origins to the present day. French contributions to western culture.

433-3 History of Germany. German state and society from the Middle Ages to the present day.

434-3 History of Scandinavia. Denmark, Norway, Sweden, Finland, and Iceland. Related history of the Baltic and North Sea regions, from prehistoric times to the present.

436-3 History of Spain. Spanish state and society from the Middle Ages to the present.

437-6 (3, 3) History of Russia. **(a)** Imperial Russia from Peter the Great to the emancipation of the serfs; **(b)** Russia since emancipation: modernization and revolution. The study of Russian history from Peter the Great to the present.

440-3 Tudor-Stuart England. England from 1485 to 1714. The social, economic and political development of Britain during the crucial two centuries from late feudal anarchy to world power.

442-3 Cultural History of England, 1780-1914. An examination of Victorian society and values as reflected in such sources as novels, essays and memoirs.

443-3 Twentieth Century England. The social, economic and political development of England in the twentieth century.

450-6 (3, 3) Early America. The evolution of American society from European settlement through the Age of Jefferson, with special emphasis on social and political institutions and thoughts.

451-3 United States History, 1815-1850. The struggle for democratic institutions and the emergence of sectional conflict in the Jacksonian Era.

452-6 (3, 3) United States History 1850-1896. **(a)** Civil War era; **(b)** the origins of modern America; reconstruction and nationalization; 1865-1896. The study of the background to the Civil War, the Civil War, Reconstruction, and the Gilded Age.

453-6 (3, 3) United States History, 1896-1945. **(a)** 1896-1921; **(b)** 1921-1945. The history of the United States since the 1890's with emphasis upon politics, political ideas and diplomacy.

454-(3, 3) United States History, 1945 to the Present. **(a)** 1945-1963; **(b)** 1963-present. An in-depth examination of the social, economic, cultural, and political changes in the United States since 1945.

460-6 (3, 3) Social History of the United States. **(a)** to 1860; **(b)** since 1860. The historical development of relationships among America's various ethnic, religious, racial, economic, and sexual groups.

461-6 (3, 3) Constitutional History of the United States. **(a)** To 1877; **(b)** from 1877. Origin and development of the American Constitution from the English background to the present time. Stress is placed on the political, social, and economic forces which influenced the American constitutional system.

463-6 (3, 3) History of American Diplomacy. **(a)** To 1900; **(b)** Since 1900. General consideration of American foreign policy and the emergence of the United States as world power.

464-6 (3, 3) American Economic History. **(a)** To 1869; **(b)** Since 1869. The growth of the American economy from the colonial period to the present. Emphasis is placed on the historical forces which influenced the American economic system.

465-6 (3, 3) History of the South. **(a)** The Old South; **(b)** The New South. Social, economic, political, and cultural developments of the South.

466-6 (3, 3) History of the American West. **(a)** Trans-Appalachian Frontier; **(b)** Trans-Mississippi Frontier. The American frontier and its impact on American society from the colonial period to the 20th century.

470-6 (3, 3) Continuity and Change in Latin America. **(a)** To 1825;**(b)** Since 1825. The interaction of economic forces and intellectual currents with Latin America social structures and political institutions, from pre-Columbian times to the present.

474-3 Andean South America. The political, economic, social, and cultural development of the Andean nations from pre-Columbian times to the present.

480-6 (3, 3) History of Chinese Civilization. **(a)** Traditional China; **(b)** Modern China. The first semester provides a full coverage of traditional China and emphasis on classical philosophies, religions, historical writings, literature, arts, and science. The second semester deals with the transformation of China into the modern ages.

484-3 History of Central Asia. Tribes, migrations, wars, and power politics in Central Asia and outlying areas of China from Han times through 19th century rivalries to latest developments along the Sino-Soviet frontier.

490-1 to 4 Special Readings in History. Supervised readings for students with sufficient background. Prerequisite: registration by special permission only.

491-3 Historiography. Writings of historians from Herodotus to the present.

493-1 to 6 Problems in History. Topics vary with instructor. May be repeated for a maximum of six semester hours provided registrations cover different topics. Topics announced in advance.

494-3 Quantitative Research in History. An introduction to the application of quantitative data and social science methods to historical research.

496-1 to 9 Internship in History. Supervised field work in public or private agencies or operation where history majors are frequently employed, such as archives and libraries, government offices, communications media, historic sites, and museums. Only three hours may be applied to the major and six hours toward the M.A. degree. Prerequisite: consent of department.

497-3 Historical Museums, Sites, Restorations and Archives. The historical development of the museum from the Academy, the Lyceum, and the Great Museum of Alexandria. Discussion of the museums that have developed in the last three centuries with emphasis on the United States will include historical sites such as battlefields, forts, historic buildings, restorations, historical monuments, and major archives. Field trips to some of these sites form part of the course.

498-3 Problems of the History Museum. Examines the general background and function of the museum in its accompanying setting with special emphasis on tasks of the individual who wishes to work in a historical museum or in an interpretative center. Given in cooperation with the University Museum. Prerequisite: consent of instructor.

500-2 The Historian's Craft. Examination of historical methodology and recent trends in historiography. How historians conduct research and convey the results of it. Special treatment of selected topics of historiography. Required of M.A. degree students. Ph.D. degree students should consult graduate advisers.

501-3 Recent Historiography. Trends in historical writing and historical interpretation in the 20th Century.

522-3 to 15 (3 per semester) Colloquium in European History. Group reading and discussion about major periods, subregions, and themes in European history. May be repeated as instructors and topics vary.

523-4 to 20 (4 per semester) Research Seminar in European History. Research and writ-

ing on selected topics in European history. Students will prepare a major paper. May be repeated as topics and instructors vary.

554-3 to 15 (3 per semester) Colloquium in United States History. Group reading and discussion about major periods, subregions, and themes in United States history. May be repeated as topics and instructors vary.

555-4 to 20 (4 per semester) Research Seminar in United States History. Research and writing on selected topics in United States history. Students will prepare a major paper. May be repeated as topics and instructors vary.

570-4 to 12 (4 per semester) Research Seminar in Latin American History. Research and writing on selected topics in Latin American history. Students will prepare a major paper. May be repeated as topics vary.

571-3 to 9 (3 per semester) Colloquium in Latin American History. Group reading and discussion about major periods, subregions, and themes in Latin American history. May be repeated as topics vary.

580-4 to 12 (4 per semester) Research Seminar in Asian History. Research and writing on selected topics in Asian history. Students will prepare a major paper. May be repeated as topics vary.

581-3 to 9 (3 per semester) Colloquium in Asian History. Group reading and discussion about major periods, subregions, and themes in Asian history. May be repeated as topics vary.

590-1 to 8 (1 to 3 per semester) Readings in History. Individual readings. Registration by special permission only. Student must obtain the consent of the faculty member involved. M.A. degree students are limited to a maximum of 4 hours toward the 30-hour requirement. Graded *S/U* only. Prerequisite: registration by special permission only.

591-2 to 5 Independent Investigation. Graded *S/U* only. Prerequisite: doctoral standing and consent of graduate adviser.

593-4 to 12 (4 per semester) Research Seminar in Contemporary History. Research and writing on selected topics in contemporary history. Students will prepare a major paper. May be repeated as topics and instructors vary.

594-3 to 9 (3 per semester) Colloquium in Social Science History. Group reading and discussion relating to the use of theories and methods from the social science disciplines in historical interpretation.

595-4 to 8 (4,4) Research Seminar in Comparative History. Research on selected topics employing cross-cultural or other comparative approaches. Students will prepare a major paper. May be repeated as topics vary.

599-1 to 6 Thesis. Minimum of three hours to be counted toward a master's degree.

600-1 to 30 (1 to 16 per semester) Dissertation.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis; or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Industrial Technology

There is no graduate degree program offered through industrial technology. See Manufacturing Systems for graduate program descriptions. Four-hundred-level courses may be taken for graduate credit unless otherwise indicated in the course description.

410-3 Mining Reclamation. Study of reclamation techniques associated with underground and surface coal mining. Emphasis is placed on the integration and cost trade-offs associated with coal extraction and reclamation as well as federal, state, and local regulations. Prerequisite: consent of instructor.

420-3 Coal Preparation and Analysis. Study of coal preparation and blending in association with coal analysis. Design and operation of preparation plants including water management, waste management, coal storage, loading, and transportation.

425-3 Advanced Process Design and Control. Extension of other process courses offered. Meets the need of those students who enter the field of manufacturing by giving more emphasis on planning, estimating, and control of industrial processes. Laboratory. Prerequisite: 208, 209.

430-3 Health and Injury Control in A Work Setting. (Same as Health Education 430.) Assesses the health and injury control programs present in a work setting. Emphasis given to employee programs in health, wellness, and injury control that are effective. Field trips to work sites are included.

439-3 Bulk Materials Handling. Study of the various types of equipment used in the mining industry. Estimation of costs and output of equipment used for excavating and transporting earth materials. Prerequisite: appropriate background.

440-3 Manufacturing Policy. Review of all areas covered by the industrial technology program. Includes problems which simulate existing conditions in industry. Students present their solutions to the class and to the instructor in a formal manner. Prerequisite: 358, 375, 382, and 475.

441-3 Mine-Safety Technology. An in-depth study of the technological implications of the Federal Coal Mine Health and Safety Act. Emphasis is placed on the technology required to operate safely underground coal mines. Prerequisite: appropriate background.

445-3 Computer-Aided Manufacturing. (Same as Engineering Technology 445.) Introduction to the use of computers in the manufacture of products. Includes the study of direct and computer numerical control of machine tools as well as interaction with process planning, inventory control, and quality control. Laboratory. Prerequisite: 208, computer programming, or consent of instructor.

455-3 Industrial Robotics. (Same as Engineering Technology 455.) Study of industrial robots

and their applications; pendant and numerical programming of robots. Robotics design including tactile and visual sensors. Technical and psychological problems of justification, installation, and management of robotic systems. Prerequisite: 445.

460-3 Mining Technology. A capstone course to include all aspects of coal mining. Group projects are assigned on the design and development of a mine with emphasis on cost, productivity, yield, equipment, and staffing. Prerequisite: 320, 321, 420, or consent of instructor.

475-3 Quality Control. Use of statistical quality control to improve work product quality. Topics include histogram, Pareto diagrams, control charts, acceptance sampling, process capability, cause and effect diagrams, and reliability. Prerequisite: senior standing.

Journalism

400-3 History of Journalism. Development of American newspapers, magazines, and radio-television with emphasis on cultural, technological, and economic backgrounds of press development. Current press structures and policies will be placed in historical perspective.

401-3 International Communication. An analysis of the development, structure, functions, and current status of media systems in other countries. Emphasis given to studying factors that facilitate or restrict the flow of intranational and international communication.

411-3 Public Affairs Reporting. Covering government and other public agencies, including the city hall, courts, county offices, business, finance, agriculture, labor, and other specialized beats. Prerequisite: 311.

442-3 The Law of Journalism. Legal limitations and privileges affecting the mass media to include the law of libel, development of obscenity law, free press and fair trial, contempt of court, right of privacy, advertising and antitrust regulations, copyright, and access to the press. Prerequisite: senior standing.

452-3 Ethics and News Media. An exploration of ethical problems confronting journalists and an evaluation of how these problems are handled by the media through a focus on current examples. The implications to the media and to society of successes and failures in meeting ethical concerns are discussed. Prerequisite: senior standing.

461-3 Specialized Publications. Functions, operations, and problems of industrial, trade, business, professional, literary, and other specialized publications. Management, personnel, and production practices. Use of research in solving problems and setting policies.

462-3 Magazine Article Writing. Principles, problems, and techniques involved in producing free-lance and staff-written magazine articles with an emphasis on determining the relationship between article content and audience market. Prerequisite: 311.

476-3 Advertising Campaigns. Application of advertising principles and techniques to the solution of a specific advertising problem facing a cooperating advertiser or advertising agency; problem analysis, development of strategy, media planning, message development, campaign presentation. Prerequisite: 372 and 374.

479-3 Social Issues and Advertising. Analysis of social issues involving advertising; economic relationships, government and self-regulation, cultural effects, influence on media content and structure, role in democratic processes, international, and other problems and controversies. Prerequisite: senior standing.

490-1 to 6 (1 to 3, 1 to 3, 1 to 3) Readings. Supervised readings on subject matter not covered in regularly scheduled courses. Undergraduates limited to maximum 2 credits per semester. Graduates limited to maximum 3 credits per semester. Prerequisite: written consent of instructor and area head.

494-1 to 3 Practicum. Study, observation, and participation in publication or broadcast activities. Prerequisite: consent of instructor and area head. Mandatory Pass/Fail for undergraduates.

495-1 to 12 (1 to 6, 1 to 6) Proseminar. Selected seminars investigating media problems or other subjects of topical importance to advanced journalism majors. Seminars will be offered as the need and the interest of students demand. Prerequisite: senior standing.

500-3 Research Methodology in Mass Communication I. Identification of research problems, formulation of concepts and research hypotheses in journalism and mass communication, sampling procedures, design of experimental and survey research.

501-3 Research Methodology in Mass Communication II. Problems of measurement, design, and analysis in journalism and mass communication research. Techniques of attitude scaling, questionnaire construction. Bivariate and multivariate data analysis. Procedures for the creation, management, and analysis of large data sets using computer programs. Prerequisite: 500 and EPSY 506, concurrent registration in 507.

504-3 Foundations of Mass Communication Theory. Conceptual orientation toward analysis of relationships in the mass communication channels. Emphasis on problem identification and relationships between philosophical basis for behavioral analysis of communication and empirical work in the field; reviews of selected literature.

505-3 Theoretical Issues in Mass Communication. Analysis and critique of recent theory and research. Examination of current trends in research and reviews of selected literature relating to mass communication in the areas of systems, interpersonal, mass media, intercultural, political, organizational, instructional, and health communication. Prerequisite: 504.

506-3 Significant Studies in Mass Communication Research. A review of a broad selection of early literature in communication research that has provided much of the conceptual basis for empirical studies during the past two decades.

510-3 Literature of Journalism. Critical reading, discussion, and evaluation of 20th century journalistic literature in such areas as media history, muckraking, press criticism, biography, memoirs and reminiscences, depiction of the journalist in fiction, new journalism.

511-3 Studies in Journalism History. Critical analysis of literature showing trends and devel-

opments in journalism before 1900. Approximately 100 books are examined in the context of social, political, and intellectual history of the times. Lectures, reports, and discussions.

512-3 Press Freedom and Censorship. Examination of the philosophical and theoretical bases of press freedom in the United States with attention to the press's English heritages and to numerous attempts at media censorship from the colonial period through the 20th century.

520-3 Communication and National Development. Functions of mass media of communication in the process of national development in the third world. Review of models of national development; problems in the diffusion and adoption of innovation; diffusion of information and influence in modernization of developing countries.

530-3 Historical Research in the Mass Media. Methods of data collection, analysis, organization, and presentation for historical research in mass media. Use of such sources as newspapers, archives, personal papers, manuscripts, and oral history. Use of statistical methods in mass media historical research. Prerequisite: 511.

540-3 Legal and Governmental Research in the Mass Media. Study of research procedures related to executive, congressional, judicial, and quasi-official reports and documents as they affect the mass media. Focus of the study will be an examination of the legal interrelationship of the government and the media. Prerequisite: 442.

550-1 to 12 (1 to 4, 1 to 4, 1 to 4) Topical Seminar. Seminars on subjects of current interest, with the topics determined through student and faculty request and interest. Topics include audience analysis, communication and social systems, media economics, persuasive communications.

560-3 Seminar: Critical and Persuasive Writing. An analysis of the opinion function of the news media—the editorialest, the opinion columnist, and the critical reviewer—with emphasis upon the theoretical bases of persuasion. Students will study and evaluate various types of persuasive writing and will also write a number of editorials, columns, and reviews.

592-1 to 6 (1 to 3, 1 to 3, 1 to 3) Individual Research. Conduct of research reports for projects of an individual nature.

599-1 to 6 Thesis.

600-1 to 24 (1 to 16 per semester) Dissertation.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Linguistics

The Department of Linguistics offers courses toward the Master of Arts degree in applied linguistics and the Master of Arts degree in English as a foreign language.

401-4 General Linguistics. Basic concepts and methods of general linguistics. Fundamentals of the nature, structure, and functioning of language. Data manipulation and problem solving.

402-6 (3, 3) Phonetics. (a) Theory and practice of articulatory phonetics. **(b)** Theory and practice of instrumental phonetics. Prerequisite: 402a.

403-3 English Phonology. Study of English phonology, both American and British, including phonetics, phonemics and prosodics. Prerequisite: 300 or 401, and 402a, or consent of department.

404-3 American Dialects. Regional variation and social stratification of American English. Phonological and syntactic differences among the major dialects of American English. Prerequisite: one previous course in linguistics.

405-4 Phonological Theories. A survey of various phonological theories involving the phoneme from the 19th century up to the present, including theoretical issues arising therefrom and relationships among the theories. Limited data analysis within the perspective of the different theories. Prerequisite: 300 or 401, and 402a.

406-3 Introduction to Historical Linguistics. An introductory survey of historical and comparative linguistics, including terminology, assumptions, and methods of investigation. Prerequisite: 403 or 405; 408 recommended.

408-4 Syntactic Theory. Basic concepts and formalisms of transformational generative grammar. Data manipulation and problem-solving in English syntax. Prerequisite: 300 or 401 or consent of department.

409-3 Linguistic Structure of Modern German. (Same as German 411.) The descriptive study of phonology, grammatical structure, and vocabulary of modern German with consideration of its structural differences from English and application to teaching. Appropriate for students with at least two years of German. Conducted in English.

411-3 The Linguistic Structure of Chinese. (See Chinese 410.)

412-3 The Linguistic Structure of Japanese. (See Japanese 410.)

413-3 Linguistic Structure of French. (See French 411.)

414-3 Linguistic Structure of Spanish. (Same as Spanish 411.) Theory and practice in Spanish pronunciation and study of Spanish grammatical structure, in contrast to English, with application to teaching.

415-3 Sociolinguistics. History, methodology, and future prospects in the study of social dialectology, linguistic geography, multilingualism, languages in contact, pidgin and creole languages, and language planning. Prerequisite: one previous course in linguistics or consent of department.

430-3 to 6 (3, 3) Grammatical Structures. Detailed analysis of the structure of particular languages. May be repeated to a total of six hours credit with consent of department. Prerequisite: one previous course in linguistics or consent of department.

431-3 Structure of the English Verb. An analysis of the English verb system. Special study of the modals and non-finites.

440-1 to 6 (1 to 3 per topic) Topics in Linguistics. Selected topics in theoretical and applied linguistics. May be repeated to a total of six hours credit with consent of department. Prerequisite: one previous course in linguistics or consent of department.

442-3 Language Planning. Survey of the field of language planning: definitions and typologies, language problems, language treatment, attitudes and beliefs about language, relations between language planning processes and other kinds of social and economic planning, linguistic innovations and other processes of language change, implementation of language policies. Prerequisite: 401, 402a.

445-4 Introduction to Psycholinguistics. (Same as Psychology 445.) A broad spectrum introduction to psycholinguistics. Topics to be covered include general methodology for the study of psycholinguistics, the nature of language, theories of human communication, language comprehension and production, first and second language acquisition, meaning and thought, natural animal communication systems, and language and the brain.

450-3 to 6 (3, 3) Language Families. A synchronic survey of particular language families or sub-families. May be repeated to a total of six hours credit with consent of department. Prerequisite: one previous course in linguistics or consent of department.

489-1 Seminar in Developmental Psycho-Neurolinguistics. Explores current issues in the area of developmental psycholinguistics and neurolinguistics. Included will be normal language use and development, as well as disordered language use and development; foreign/second as well as first language will be included. Development will be intrepreted to mean life span. Prerequisite: consent of instructor.

501-3 Approaches to the Analysis Error. Theory and methodology of contrastive analysis and error analysis. Application of both methodologies to comparison of English syntactic and phonological structures with those of other languages. Prerequisite: 401 or consent of department.

506-4 Historical Linguistics. Theories and methods in the study of the history and prehistory of languages and language families. Prerequisite: 405 and 406, or consent of department.

507-3 Pidgin and Creole Languages. (Same as Anthropology 540.) Survey of the world's pidgins and creoles, with emphasis on the English-based Atlantic creoles. Comparison of creolization with first and second language acquisition, and with the origin and evolutionary development of human language. Prerequisite: one previous course in linguistics or consent of department.

510-3 History of Linguistics. The history of linguistic inquiry from classical times to the present. Prerequisite: one previous course in linguistics or consent of department.

530-3 Pedagogical Grammar for the EFL/ESL Teacher. This course reviews basic grammatical structure of English from the perspective of the teacher of English as a foreign or second language. A variety of approaches are relied on in an attempt to develop accurate and effective insights into the nature of key features of English grammar. Individual projects allow students to explore applications to EFL/ESL materials and methods. Prerequisite: 401 and 570.

540-3 to 12 (3 per topic) Studies in Applied Linguistics. Selected topics in applied linguistics. **(a)** Research methods, **(b)** pragmatics, **(c)** other. May be repeated as topics vary to a total of 12 hours of credit with consent of department. Maximum of 6 hours applicable toward a basic master's degree. Prerequisite: one previous course in linguistics or consent of department.

541-3 Second Language Acquisition. A basic introduction to research in second language acquisition, including models, methods of investigation, and factors which affect language learning. Prerequisite: 570 or consent of department.

545-3 Advanced Seminar in Psycholinguistics. Relevant psycholinguistic research is studied in terms of research design criteria, appropriateness of statistical procedures, and practical applications for language teaching/learning and teacher training. Prerequisites: 445 and prior or concurrent registration in EPSY 506, or consent of department.

546-3 Conversation Analysis. (See Speech Communication 546.) Prerequisite: consent of instructor.

548-3 Lexicography. An introduction to the art and craft of dictionary-making: differences between dictionaries and other reference works; history of dictionaries around the world; how dictionaries are produced, evaluated, selected, and used; bilingual vs. monolingual dictionaries in the teaching and learning of English and other languages.

550-4 to 8 (4 per topic) Seminar in Theoretical Linguistics. Guided advanced research in **(a)** syntax and semantics, **(b)** phonology, **(c)** sociolinguistics, **(d)** selected topics. Sections **(a)** through **(c)** may be taken only once each. Section **(d)** may be repeated as topics vary. Prerequisite: consent of department.

570-4 Theory and Methods of EFL/ESL. Theory and methods of teaching English as a second or foreign language, techniques and procedures in teaching most language skills, comparative and current methodology.

571-3 Language Laboratories in EFL/ESL. The theory and practice of the language laboratory in EFL/ESL pedagogy. Review and analysis of audio, video, and computer assisted devices applicable to second language teaching. Prerequisite: 570 or consent of department.

572-2 Materials Preparation in EFL/ESL. Theory and practice in development of EFL/ESL texts. Prerequisite: 570 or consent of department.

575-3 EFL/ESL Testing. Discussion of different second language (L2) testing purposes, characteristics of good L2 tests, process of L2 test development, evaluation and revision of L2 tests, interpretation and reporting of L2 test results, current trends in L2 testing. Prerequisite: 570 or consent of department.

580-3 to 6 per semester Seminar in Special Problems of EFL/ESL. Selected topics in special problem areas of EFL/ESL. **(a)** Administration of intensive English programs, **(b)** teaching English abroad, **(c)** EFL for experienced foreign teachers, **(d)** teaching reading in EFL/ESL, **(e)** selected topics. Sections **(a)** through **(d)** may be

taken only once each. Section **(e)** may be repeated as topics vary. Prerequisite: 570 or consent of department.

581-3 Practicum in EFL/ESL: Oral English. Class observation and supervised practice teaching in English as a foreign language; meets concurrently with LING 100. Prerequisite: 570 or concurrent enrollment or consent of department.

582-3 Notional/Functional Syllabus. The course examines theory and applications of the "notional-functional syllabus" in self-control, and second language teaching, including pragmatics, textbook analysis, materials and development, and the relationship of notional and structural syllabi.

583-3 Innovative Methods in EFL/ESL. Analysis of the most important methodologies in teaching EFL/ESL, including Silent Way, Counseling-Learning/CLL, Suggestopedia, Comprehension Training, and Total Physical Response. Prerequisite: 570 or permission of instructor.

584-3 Teaching of EFL/ESL Composition. Analysis of current theories of composition in a second language, research on nature of the writing process, and applications of research for the teaching of writing in a second language. Prerequisite: 570 or consent of instructor.

585-3 Practicum in EFL/ESL: Written English. Objectives, methods, and materials for LING 101 and 105 and similar courses. Observation and practice under supervision. Prerequisite: consent of department.

593-1 to 4 Research in Linguistics. Individual research under graduate faculty guidance. Prerequisite: consent of instructor.

596-3 Stylistics. (See English 596.)

597-1 to 8 Readings in Linguistics. Individual readings in linguistics under graduate faculty guidance. Prerequisite: consent of department.

599-1 to 6 Thesis. Minimum of three hours to be counted toward a master's degree. Prerequisite: consent of department.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Management

(See Business Administration.)

Manufacturing Systems

510-3 Recent Advances in Quality Assurance. Study of recent advances in quality planning, quality measurement, design assurance, process control, participatory management, supplier quality, customer relations, and improvement concepts. Prerequisite: IT 475.

520-3 Computer-Aided Manufacturing II. Advanced study of the use of computers in the manufacture of products. Emphasis is placed on CAD/CAM integration, CAM generated data, and current CAM languages. Prerequisite: IT 445.

525-3 Computer Integrated Manufacturing. Theory and practice of using the computer to integrate the functional manufacturing areas into an effective system. Use of applications software is emphasized. Prerequisite: IT 445 and 475.

530-3 Mechanical Aspects of Robots. Advanced application of mechanics, mechanisms, hydraulics, pneumatics, strength of materials, and machine design to robotics. Prerequisite: IT 455.

535-3 Computer Control of Manufacturing Systems. Application of computer technology to the control of manufacturing equipment, processes, and systems. Emphasis is placed on the hardware aspects from an overall systems viewpoint. Prerequisite: IT 455.

545-3 Electrical and Electronic Aspects of Robots. Analysis of servo motors, actuators, sensors, and noise and feedback technique that drive robot manipulators. Prerequisite: IT 455.

560-3 Automated Factory. Advanced study of the integration of robots, automated assemble, automated storage and retrieval systems, automated inspection, and computer-controlled transfer systems. Economic justification and implementation are emphasized. Prerequisite: 520, IT 455.

580-1 to 4 Seminar. Collective and individual study of issues and problems related to manufacturing systems. Graded *S/U*. Prerequisite: enrollment in the MS degree in Manufacturing Systems.

585-3 Research Methods. Study of research methods in manufacturing including the development of proposals, the use of statistics in the analysis, and communication of results. Prerequisite: 510 and MATH 458.

592-1 to 4 Special Investigations in Manufacturing Systems. Advanced topics in manufacturing systems. Topics are selected by mutual agreement of the student and the instructor. Prerequisite: consent of adviser.

599-1 to 6 Thesis.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Marketing

(See Business Administration.)

Mathematics

400-3 History of Mathematics. An introduction to the development of major mathematics concepts. Particular attention given to the evolution of the abstract concept of space, to the evolution of abstract algebra, to the evolution of the function concept, and to the changes in the concept of rigor in mathematics from 600 B.C. Does not count toward a mathematics major in the College of Liberal Arts or in the College of Science. Prerequisite: 319 and 352 or consent of instructor.

405-3 Intermediate Ordinary Differential Equations. Topics selected from linear systems, existence and uniqueness for initial value and boundary value problems, oscillation, and stability. Prerequisite: 306.

406-3 Eigenfunction Analysis. Discrete and continuous models for the vibrating string; separation of variables and eigenfunction analysis; inner product spaces; operators on inner product spaces; the spectral theorem for Hermitian operators on finite dimensional spaces with applications; the Courant-Fisher max-min characterization of eigenvalues; the spectral theorem for compact Hermitian operators with applications to Sturm-Liouville boundary value problems and Fredholm integral equations. Prerequisite: 221 and 305.

407-3 Introduction to Partial Differential Equations. First order linear and quasilinear partial differential equations, characteristics, second order linear partial differential equations, classification of types, boundary value and initial value problems, well posed problems, the wave equation, domain of dependence, range of influence, Laplace's equation and Dirichlet problems, the maximum principle. Poisson's integral, fundamental solution of the heat equation. Prerequisite: 251, 305.

409-3 Introduction to Fourier Analysis. The Fourier synthesis and analysis equations for functions on the real line, the circle, the integers, and the regular N-gon; convolution; techniques for finding Fourier transforms; operators associated with Fourier analysis; the FFT and FHT algorithms and fast convolution; generalized functions; applications to probability, partial differential equations, linear systems, and numerical analysis. Prerequisite: 221 and 305.

411-1 to 6 (1 to 3, 1 to 3) Mathematical Topics for Teachers. Variety of short courses in mathematical ideas useful in curriculum enrichment in elementary and secondary mathematics. May be repeated as topics vary. Does not count toward a mathematics major.

412-3 Problem Solving Approaches to Basic Mathematical Skills. Content of basic skills at all levels of education and the development of these skills from elementary school through college; emphasis on problem solving and problem solving techniques; determination of student skills and proficiency level. Credit may not be applied toward degree requirements in mathematics. Prerequisite: 314 or equivalent.

417-3 Applied Matrix Theory. Matrix algebra and simple applications, simultaneous linear equations, linear dependence and independence of vectors, rank and inverses, determinants, eigenvalues and eigenvectors, quadratic forms, applications. This course may not be counted toward a graduate degree in mathematics. Prerequisite: 139 or 221 or consent of department.

419-3 Introduction to Abstract Algebra II. Solvable groups, maximal ideals, basis and dimension, elementary field extension theory, splitting fields, geometric constructions, elementary Galois theory, Galois group of a polynomial, solution of equations in radicals. Prerequisite: 319 or consent of instructor.

421-3 Linear Algebra. Fields, vector spaces over fields, triangular and Jordan forms of matrices, dual spaces and tensor products, bilinear forms, inner product spaces. Prerequisite: 221.

425-3 Theory of Numbers. Properties of integers, primes, divisibility, congruences, quadratic forms, diophantine equations, and other topics in number theory. Prerequisite: 319 or consent of department.

433-3 Introduction to Topology. Study of continuity, convergence, compactness, and completeness in the context of metric spaces. Prerequisite: 352 or consent of department.

435-3 Elementary Differential Geometry. An introduction to modern differential geometry through the study of curves and surfaces in R<SUP/3>. Local curve theory with emphasis on the Serret-Frenet formulas; global curve theory including Fenchel's theorem; local surface theory motivated by curve theory; global surface theory including the Gauss-Bonnet theorem. Prerequisite: 251 and 221.

447-3 Introduction to Graph Theory. (Same as Computer Science 447.) Introduction to theory of graphs, digraphs, and networks and applications to electrical systems and computer science. Topics include blocks and cut-points, Eulerian graphs, trees, cycle and cocycle spaces, planarity and Kuratowski's Theorem, connectivity and Menger's Theorem, Hamiltonian graphs, colorability and Heawood's Theorem, flows in networks and Ford-Fulkerson Theorem, critical path analysis. Prerequisite: 221 and 319 or Computer Science 315.

449-3 Introduction to Combinatorics. (Same as Computer Science 449.) An introduction to combinatorial mathematics with computing applications. Topics include selections and arrangements, generating functions, recursion, inclusion and exclusion, coding theory, block designs. Prerequisite: 319 or Computer Science 315 or consent of instructor.

450-3 Methods of Advanced Calculus. Sequences and series of functions; partial differentiation; Jacobians; the implicit function theorem; the classical differential operators in general curvilinear coordinates; line, surface, and volume integrals, the divergence and Stokes' theorems; transformation of variables in multiple integrals; integrals containing a parameter. Prerequisite: 251.

452-3 Introduction to Analysis. A rigorous development of one-variable calculus concepts including the real numbers, sets, limits of sequences, continuity of functions, differentiation, Riemann-Stieltjes integration, series of functions

at a more advanced level than 352. Prerequisite: 251.

455-3 Introduction to Complex Analysis and Applications. Complex numbers, analytic functions, line integrals, the Cauchy-Goursat theorem and its implications, power series. Laurent series, polar and essential singularities, analytic continuation, contour integration, residue theorem, conformal mapping. Prerequisite: 251.

457-3 Methods of Quantitative Analysis. (Same as Business Administration 451.) Introductory survey of basic quantitative methods necessary for graduate study in business; designed for students with deficiencies in methods of quantitative analysis. Course consists of introduction to calculus, matrix algebra, and probability. Extensive use is made of business examples. Prerequisite: enrollment in Master of Business Administration program or consent of department; Math 108 or equivalent.

458-3 Statistical Methods in Business and Industry. Basic probability concepts; random variables; univariate and joint distributions; Bernoulli, binomial, Poisson, normal, exponential, gamma, chi-square, t and F distributions; sampling distributions; estimation by the method of moments and the method of maximum likelihood; confidence intervals; hypothesis tests for normal, Bernoulli and Poisson distributions; simple regressions and analysis of variance problems. Prerequisite: 140 or equivalent and graduate standing in College of Business and Administration or the College of Engineering and Technology.

460-3 Transformation Geometry. Geometry as the study of properties invariant under congruences, similarities, affine transformations, and projectivities. Prerequisite: 221 and 319.

471-3 Introduction to Optimization Techniques. (Same as Computer Science 471.) Nature of optimization problems. General and special purpose methods of optimization, such as linear programming, classical optimization, separable programming, integer programming, and dynamic programming. Prerequisite: 221, 250. Computer Science 202.

472-3 Linear Programming. (Same as Computer Science 472.) Nature and purpose of the linear programming model. Development of the simplex method. Application of the model to various problems. Duality theory. Transportation. Assignment problems. Postoptimality analysis. Prerequisite: 221 and Computer Science 202.

473-3 Reliability Theory. Formulation of the concept of reliability in terms of probability theory. Failure distributions and failure rates. Elements of renewal theory. Age and block replacement policies, optimal replacement policies, optimal replacement policies for classes of failure distributions. Prerequisite: 480 or 483, or consent of department.

475-6 (3, 3) Numerical Analysis. (Same as Computer Science 464.) An introduction to the theory and practice of computation with special emphasis on methods useful with digital computers. Topics include the solution of nonlinear equations, interpolation and approximation, numerical differentiation and integration, solution of differential equations, matrix calculations and the solution of systems of linear equations. Prerequisite: (a) 221 and 250 and a working knowledge of FORTRAN; (b) 305and 475a.

480-4 Introduction to Probability. A comprehensive introduction to probability theory at a level suited to upper-division undergraduates and first-year graduate students. Topics include: event spaces, probabilty functions, combinatorics, generating functions, conditional probability, independence, random variables, probability distributions, expectations, moments, characteristic functions, inversion formulas, sums of independent random variables, the multivariate normal distributions, the central limit theorem, the weak and strong laws of lrge numbers. Prerequisite: 251.

481-3 Elements of Stochastic Processes. An introduction, including normal, Poisson, and Markov processes. Prerequisite: 380 or 480.

483-4 Mathematical Statistics in Engineering and Physical Sciences I. Introduction to statistical theory with applications in engineering and the physical sciences. Probability: axioms, distributions including noncentral distributions, moments and moment generating functions, order statistics. Statistical inference: point and interval estimation, testing hypotheses, likelihood ratio tests. Prerequisite: 250.

484-4 Mathematical Statistics in Engineering and Physical Sciences II. An introduction to linear models and the design of experiments with applications in engineering and the physical sciences. Analysis of the general linear model, basic designs and criteria, response surface analysis and factor analysis. Statistical computation. Prerequisite: 483 and 221, or consent of instructor.

485-3 Applied Statistical Analysis. Elements of survey sampling including simple random and stratified sampling, ratio and regression estimates; elements of nonparametric methods including the sign, Wilcoxon and Kruskal-Wallis tests; analysis of categorical data including loglinear models. Prerequisite: 480 or 483 or consent of instructor.

495-1 to 6 Special Topics in Mathematics. Individual study or small group discussions in special areas of interest under the direction of a member of the faculty. Prerequisite: consent of chairperson and instructor.

501-3 Real Analysis. Structure of sets of real numbers; Lebesque measure; measurable functions; integration; convergence theorems; functions of bounded variation; absolutely continuous functions; Lp spaces; general measure spaces; radon-Nikodym theorem; product measures and Fubini's theorem. Prerequisite: 452.

502-3 Modern Analysis. Banach spaces; bounded operators; Baire category theorem and its consequences; dual spaces; Hahn-Banach theorem; Hilbert spaces, Riesz representation theorem; Frechet derivatives; function spaces. Prerequisite: 501.

505-3 Ordinary Differential Equations. Existence and uniqueness theorems; general properties of solutions; linear systems; geometric theory of nonlinear equations; stability; self-adjoint boundary value problems; oscillation theorems. Prerequisite: 452 and 421 or consent of instructor.

506-1 to 12 Advanced Topics in Ordinary Differential Equations. Selected advanced topics in ordinary differential equations chosen from such areas as: stability, oscillations, functional

differential equations, perturbations, limit point and limit circle, boundary value problems. Prerequisite: consent of instructor.

507-3 Partial Differential Equations. Origins of PDE's. The wave equation, potential equation, and heat equation. Initial and boundary value problems and questions of well posedness. Fundamental solutions and the related Riemann, Green, and Neumann functions. Classification of linear and quasilinear PDE's. Theory of characteristics. The Cauchy-Kowalawski theorem. The max-min principle, the energy-integral method, and questions of uniqueness. Questions of existence. Prerequisite: 407 and 501.

508-3 Integral Equations. Origins of integral equations. Volterra equations of the first and second kind. Fredholm equations of the first and second kind. Fredholm's alternative theorem. The resolvent equation. Orthonormal eigensystems of a symmetric Fredholm operator. The Hilbert-Schmidt expansion theorem and its applications to Sturm-Liouville problems. Exact and approximation methods of solution. Prerequisite: 452 and 406 or 421.

511-3 Advanced Topics in the Teaching of Mathematics. (Same as Curriculum and Instruction 529.) Selected advanced topics in the teaching of mathematics chosen from such areas as: pedagogical theories; instructional strategies; applications of mathematics; problem solving. This course is counted by the Mathematics department only as part of an approved minor. Prerequisite: consent of instructor.

512-1 to 21 Topics in Mathematics for Teachers of Elementary, Middle School, and Junior High Mathematics. **(a)** Abstract Algebra. **(b)** Geometry. **(c)** Probability and Statistics. **(d)** Sets, Logic and Number Systems. **(e)** Applications of Mathematics. **(f)** Algebra. **(g)** History of Mathematics. This course is counted by the Mathematics department only as part of an approved minor.

513-1 to 27 Topics in Mathematics for Teachers of Secondary Mathematics. **(a)** Abstract Algebra. **(b)** Geometry. **(c)** Probability and Statistics. **(d)** Sets, Logic and Number Systems. **(e)** Applications of Mathematics. **(f)** Analysis. **(g)** Discrete Mathematics. **(h)** Topology. **(i)** Computer Simulation. This course is counted by the Mathematics department only as part of an approved minor.

516-8 (4,4) Statistical Analysis in the Social Sciences. **(a)** Descriptive statistics; graphic display of data; concepts of probability; statistical estimation, and hypothesis testing. Applications to social science data. **(b)** Matrix algebra; general linear model; multivariate statistics, ordinal and nominal measures of associations, and causal modeling. Applications to social science data. This course does not give credit toward a mathematics major. Prerequisite: one year of high school algebra or equivalent.

519-3 Algebraic Structures I. Groups, subgroups, normal subgroups and homomorphism theorems, permutation groups, finite direct products, finite abelian groups, p-groups and Sylow's theorems, normal and subnormal series, Jordan-Holder theorem. Rings and subrings, divisibility theory in integral domains, polynomial rings. Prerequisite: 419 or consent of department.

520-3 Algebraic Structures II. Algebraic field extensions; splitting fields, algebraic closure, separable and inseparable extensions; finite fields; norms and traces, the fundamental theorem of Galois theory. Free modules, torsion modules, tensor products of modules, finitely generated modules over principal ideal domains, application of abelian groups. Prerequisite: 519.

522-1 to 12 Advanced Topics in Algebra and Number Theory. Selected topics in modern algebra and number theory chosen from such areas as: group theory, commutative algebra, non-commutative algebra, field theory, representation theory, analytical number theory, algebraic number theory, additive number theory. Diophantine approximations, Dirichlet series, and automorphic form. Prerequisite: consent of instructor.

525-3 Number Theory. Introduction to modern analytic and algebraic techniques used in the study of quadratic forms, the distribution of prime numbers, diophantine approximations, and other topics of classical number theory. Prerequisite: 425.

530-3 General Topology. Topological spaces, continuous functions, product topology, convergence, separation and countability, compactness, connectedness, local properties, metrizability, compact-open topology. Prerequisite: 433, 452.

531-3 Algebraic Topology. Simplicial complexes. Simplicial approximation. Chain complexes. Simplicial homology. Singular homology. Applications to spheres and Euclidean spaces. Universal coefficient theorem. Cohomology. Prerequisite: 419, 433, or 530.

532-1 to 12 Advanced Topics in Topology and Geometry. Selected advanced topics in topology and geometry chosen from such areas as: metrization, topological groups, uniform spaces, homotopy theory, covering spaces, fixed point theory, Poincare duality, differential topology, categorical topology, ordered topological spaces, complex manifolds, fibre bundles, vector bundles, sheaf theory, differential geometry, Morse theory, relativity. Prerequisite: consent of instructor.

536-3 Differential Geometry. Basic manifold theory, linear connections, Riemannian geometry, DeRham cohomology, applications. Prerequisite: 421, 433 or 435.

549-3 Combinatorial Theory. Graph theory: review of basic concepts, algebraic graph theory, trees, planarity, Ramsey's theorem, factorizations. Block designs: balanced incomplete block designs, finite geometrics, triple systems, arrays. Introduction to algebraic coding theory. Introduction to modern cryptography. Prerequisite: 499 or consent of department.

551-3 Functional Analysis. Topological vector spaces; weak topologies; bounded and unbounded operators in Hilbert space; spectral theory; distributions; Sobolev spaces; normed rings; normed algebras. Prerequisite: 502.

553-1 to 12 Advanced Topics in Analysis and Functional Analysis. Advanced topics in analysis and functional analysis from such areas as: harmonic analysis, approximation theory, integration theory, advanced complex variables, topological vector spaces, operator theory, Banach algebras, distribution theory. Prerequisite: consent of instructor.

555-3 Complex Variables. Extended complex plane; Cauchy-Riemann equations: conformality; analytic continuation; power series; elementary functions; Cauchy integral theorem and consequences; Cauchy integral formula; maximum modulus principle; Liouville's theorems; Laurent expansion; residue theorem and evaluation of real integrals; principle of argument; Rouche's theorem. Prerequisite: 452.

559-1 to 3 per topic Advanced Topics in Combinatorics. Selected advanced topics in Combinatorics chosen from such areas as: graph theory; combinatorial designs; coding theory; cryptography; enumeration combinatorics on words; combinatorial algorithms. Prerequisite: consent of instructor.

560-3 Calculus of Variations. The basic problems of calculus of variations. The classical necessary conditions and their application. Canonical form of the Euler-Lagrange equations and Hamilton's principle. Fields and sufficient condition. Pontryagin's necessary condition and its application to control theory and to the classical problems of the calculus of variations. Prerequisite: 452.

566-3 Introduction to Continuum Mechanics. A rigorous development of continuum mechanics including: elements of tensor analysis; kinematics; balance of mass, linear momentum, and angular momentum; the concept of stress; constitutive equations for fluid and solid bodies; the principle of frame indifference. Prerequisite: 450 or 452 and one of 406, 421, 435.

569-1 to 12 Advanced Topics in Applied Mathematics. Selected advanced topics in applied mathematics chosen from such areas as: continuum mechanics; electromagnetic theory; control theory; mathematical physics. Prerequisite: consent of instructor.

570-1 to 12 Advanced Topics in Optimization. Selected advanced topics in optimization and operations research chosen from such areas as: calculus of variations, optimal control theory, nonlinear programming, convex analysis, nonsmooth analysis, new flows, advanced computer simulation, large scale linear programming. Prerequisite: consent of instructor.

572-1 to 12 Advanced Topics in Numerical Analysis. (Same as Computer Science 564.) Selected advanced topics in numerical analysis chosen from such areas as: approximation theory, numerical solution of initial value problems; numerical solution of boundary value problems, numerical linear algebra, numerical methods of optimization, functional analytic methods. Prerequisite: consent of instructor.

574-3 Approximation Theory. Existence, uniqueness, and characterization of best approximations in normed linear spaces; projection methods for good approximation: the Weierstrass, Muntz-Szasz, and Stone-Weierstrass theorems; degree of approximation and the Jackson theorems; construction of optimal min-max and least squares approximation using rational functions, splines, exponential sums. Prerequisite: 452, 475a and 406 or 421.

575-3 Matrix Computations. An introduction to modern numerical linear algebra including: vector and matrix norms; Householder, Givens, and Gauss transforms; factorization methods for solving systems of linear equations with roundoff error analysis; QR and SVD methods for solving linear least squres problems; the QR algorithm for computing the eigenvalues of a matrix. Prerequisite: 475a and one of 406, 421.

580-3 Statistical Theory. An introduction to mathematical statistics. Estimation theory including such topics as the Cramer-Rao and Chapman-Robbins inequalities, and the Rao-Blackwell theorem. Testing hypotheses with emphasis on the monotone likelihood ratio and the exponential family. A short introduction to Bayes and other decision procedures. Prerequisite: 480 or 483.

581-3 Probability. General probability spaces, review of measure and integration; product spaces, product measures, Fubini's theorem. Probability and random variables: induced measures, distribution functions, expectations, types of convergence, independence, characteristic functions. Sums of independent random variables: tail events and tail functions; Borel Cantelli lemma, zero-one law; Kolmogorov's inequality, convergence of series, the Strong Law of Large Numbers. Prerequisite: a concurrent course in real variables (501).

582-1 to 6 Advanced Topics in Probability. Selected advanced topics in probability chosen from such areas as: martingales, Markov processes, Brownian motion, infinitely divisible laws. Prerequisite: consent of instructor.

583-1 to 6 Advanced Topics in Statistics. Selected advanced topics in statistics chosen from such areas as: advanced linear models, advanced experimental design, multivariate statistical analysis, decision theory, advanced nonparametric theory. Prerequisite: consent of instructor.

585-1 to 2 Statistical Consulting. Consulting with university researchers under the supervision of a member of the statistics faculty. A writeup of each consultation will be required. Prerequisite: 484 or 485 and consent of instructor.

590-1 to 6 Contemporary Mathematics Research. Lectures on various mathematical topics of current research interest by members of the department and by distinguished visitors. Prerequisite: consent of the graduate adviser.

592-1 to 6 Advanced Topics in Mathematics for Teachers. **(a)** Algebra. **(b)** Geometry. **(c)** Analysis. **(d)** Probability and Statistics. **(e)** Discrete Mathematics. Credit not applicable to graduate program in mathematics.

595-1 to 12 per topic Special Project. An individual project, including a written report. **(a)** Algebra. **(b)** Geometry. **(c)** Analysis. **(d)** Probability and Statistics. **(e)** Mathematics Education. **(f)** Logic and Foundations. **(g)** Topology. **(h)** Applied mathematics. **(i)** Differential Equations. **(j)** Number Theory. Graded S/U only. Prerequisite: consent of instructor.

599-1 to 6 Thesis. Minimum of three hours to be counted toward the Master of Arts degree.

600-1 to 30 (1 to 16 per semester) Dissertation. Minimum of 24 hours to be earned for the Doctor of Philosophy degree.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed

a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Mechanical Engineering and Energy Processes

(See Engineering.)

Medical Education Preparation

No graduate degree program is offered through medical education preparation. Please refer to the Undergraduate Catalog.

Microbiology

403-3 Medical Microbiology Lecture. A survey of the more common bacterial, mycotic and viral infections of humans with particular emphasis on the distinctive properties, pathogenic mechanisms, epidemiology, immunology, diagnosis and control of disease-causing microorganisms. Three hours lecture. Fall semester. Prerequisite: 301.

404-2 Medical Microbiology Laboratory. Procedures for the collection and handling of medical specimens for microbial examination, cultivation and identification of pathogenic microorganisms by their morphological, biochemical, and serological characteristics. Four hours laboratory. Fall semester. Prerequisite: 403 or concurrent enrollment.

421-3 Biotechnology. Topics covered will include the genetic basis of the revolution in biotechnology, medical applications including genetic screening and theraputic agents, industrial biotechnology and fermentation, and agricultural applications. Three hours lecture. Prerequisite: 302.

425-3 Biochemistry and Physiology of Microorganisms Lecture. Chemical composition, cellular structure, and metabolism of microorganisms. Prerequisite: organic chemistry.

426-2 Biochemistry and Physiology of Microorganisms Laboratory. Laboratory course to study techniques for investigating the chemical composition, cellular structure and metabolism of microorganisms. Prerequisite: 425 or concurrent enrollment, organic chemistry.

441-3 Virology Lecture. General properties; classification and multiplication of bacterial and animal viruses; lysogeny; immunological and serological reactions; relation of viruses to cancer; consideration of selected viral diseases of animals. Prerequisite: 301 and 302.

442-2 Virology Laboratory. Tissue culture methods, multiplication and assay of animal and bacterial viruses, purification, electron microscopy, interference, immunity. Five hours laboratory. Prerequisite: 441 or concurrent enrollment.

451-3 Immunology Lecture. Natural and acquired immunity. Antigens, antibodies, and antigen-antibody reactions in vitro and in vivo. Three hours lecture. Prerequisite: 403.

452-2 Immunology Laboratory. Natural defense mechanism and immune response, preparation of antigens and antibodies, serological reactions, conjugated antibodies, electrophoresis, immunological reactions in vivo. Five hours laboratory. Prerequisite: 451 or concurrent enrollment.

460-3 Genetics of Bacteria and Viruses Lecture. Genetic mechanisms, mutation, transformation, recombination, transduction, lysogeny, phenotypic mixing, and reactivation phenomena. Three hours lecture. Prerequisite: 301.

461-3 Genetics of Bacteria and Viruses Laboratory. Use of bacteria, plasmids and viruses in transduction, genetic mapping, transposon mutagenesis, and the construction of gene fusions. Performing *in vitro* DNA manipulations such as restriction enzyme mapping, construction of gene libraries, and subcloning. Six hours laboratory. Prerequisite: 460 or concurrent enrollment.

470-3 Procaryotic Diversity. A consideration of the major groups of procaryotes with special emphasis on their comparative physiology and biochemistry. Prerequisite: 301 or equivalent.

471-2 Procaryotic Diversity Laboratory. Principles of bacterial nutrition, preparation of microbial growth media, enrichment, isolation, and characterization of aerobic and anaerobic bacteria from natural habitats. Five hours laboratory per week. Prerequisite: 470 or concurrent enrollment.

500-1 Seminar. Microbiology departmental seminar. Graded *S/U* only. Prerequisite: graduate standing.

501-1 Pre-Professional Training. A one hour course designed to formally introduce students coming into the microbiology program to the research, teaching, and support facilities available in Carbondale and at Springfield. Prerequisite is acceptance into the microbiology graduate program. This course will be required in addition to all Graduate School course and hour requirement. Graded *S/U* only.

504-3 Methods of Microbiological Research. Problem definition, experimental design, and research methods in specific areas of microbiology. Lecture and laboratory hours to be arranged.

505-1 Special Topics in Microbiology. Discussion of current research in specific areas of microbiology. One hour of group discussion per week. Prerequisite: consent of instructor.

511-1 to 66 (1 to 12 per semester) Research. Graded *S/U* only. Prerequisite: consent of instructor.

515-1 to 6 (1 to 6 per semester) Master's Degree Research. Individualized laboratory research and training for graduate students beginning their research career at the Master's level. Graded credit. Prerequisite: admission to the Master's degree program in Microbiology and consent of instructor.

520-2 Advanced Microbial Physiology and Control Mechanisms. The physiology, biochemistry, and genetics of microbial regulatory mech-

anisms. Topics include transport phenomena, catabolite and nitrogen repression, the stringent response, and autoregulatory phenomena. Two lectures per week. Prerequisite: 425a and b, or CHEM 451a and b, or permission.

528-1 to 3 Readings in Microbiology. Supervised readings for qualified graduate students. Prerequisite: consent of instructor.

530-3 Advanced Cellular Biology. An advanced course based on current literature concerning the cellular biology of eukaryotes. Both students and faculty will make presentations followed by discussion. Topics will include: the cellular and subcellular structure and function of the lower eukaryotes, the biochemistry and biophysics of eukaryotic membrane systems, and the higher subcellular functions of mammalian cells. Prerequisite: 400 level course in genetics and in biochemistry or consent of instructor.

542-3 Molecular Virology. Interactions at the molecular level between tumorigenic and nontumorigenic DNA and RNA viruses and host cells, biochemical analysis of the growth cycle, uncoating, synthesis of virus-specified messenger RNA, enzymes and structural proteins, replication of viral nucleic acid and maturation. Three hours lecture. Prerequisite: 441.

543-3 Host-Microbial Interactions. A lecture course that deals in depth with mechanisms of symbiosis and other interactions with respect to the biochemistry of microbe and host. Immunological aspects are discussed. Emphasis is placed on molecular mechanisms. Offered alternated years. Prerequisite: 403 or consent of instructor.

551-3 Advanced Immunology. A lecture course that intensively considers the most recent developments in antibody structure, antigenic analysis, and antigen-antibody reactions. A special focus will be on the use of immunology as a research tool. Prerequisite: 451 and 452, or equivalent, or consent of instructor.

552-2 Cellular Immunology. A lecture-discussion course covering contemporary aspects of cellular immunology. The cellular nature of immune responses as well as current information on the regulation of such responses will be considered. Topics will include cellular components of an immune response; receptors, recognition and signals; cellular cooperation; immunoregulation; and tolerance and autoreactivity. Prerequisite: 451 and 452, or equivalent, or consent of instructor.

553-4 Advanced Medical Microbiology and Immunology. A laboratory/lecture course providing an indepth analysis of the mechanisms of pathogenesis of bacterial, viral, and mycotic infections. Immune mechanisms involved in recovery from infection, development of an immune state, and infection-mediated immunopathology will be covered. Three hours lecture and two hours of laboratory per week. Prerequisite: 403 and 451, their equivalent, or consent of the instructor.

562-3 Molecular Genetics. A lecture and discussion course emphasizing current research and new techniques in replication, transcription, translation, genome organization, gene flow from a general systems viewpoint and regulation. Prerequisite: 400-level course in genetics and in biochemistry or consent of instructor.

599-1 to 3 Thesis. Prerequisite: consent of instructor.

600-1 to 36 (1 to 12 per semester) Dissertation. Prerequisite: consent of instructor.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Mining Engineering

400-3 Principles of Mining Engineering. Basic principles of mineral exploration, development, and processing. Environmental problems related to mineral development. Prerequisite: junior standing in engineering.

401-1 Mining Environmental Impacts and Permits. Socio-economic impacts of mining industry. Analyzing the markets for coal and its products. Mining operations and related environmental impacts. Mining permits. Prerequisite: 400 or consent of instructor.

410-3 Underground Mining Systems Design. Study of coal property evaluation. Underground mining methods. Design of mine production and its ancillary systems and subsystems. Prerequisite: 320, 400, Geology 390.

411-2 Mine Machinery. Analysis and design of underground and surface mining machinery. Equipment and parts selection. System development. Preventive maintenance. Prerequisite: 410.

413-3 Mine Power Systems. Study of electrical, hydraulic and pneumatic mine power systems. Selection and design of power systems and their components for surface and underground mines. Related economics and decision making criteria. Design of power systems for surface mines, protection of mine power systems. Prerequisite: 410, and Engineering 385, or equivalent, or consent of instructor.

415-3 Surface Mining and Land Reclamation. Surface mining systems for coal and noncoal minerals. Development of mining operations, equipment selection, mine planning and design, land reclamation, erosion and sedimentation control. Prerequisite: 320, 400, Geology 390.

418-3 Mining of Ore Deposits. Analysis, planning, and design of surface hardrock mines and underground mining system. Analysis of mining and equipment costs. Prerequisite: 320, 400, and Geology 390.

420-3 Mineral and Coal Processing. Impurities in coal and their impact on the market. Impurities liberation and separation methods. Product preparation. Coal washability characteristics. Flow sheet development. Recovery of minerals from tailings, slurry ponds and mine waste. Economics of mineral processing. Laboratory. Prerequisite: 400, Geology 390.

425-3 Mine Ventilation Systems Design. Study of the theories and practice of natural and forced mine ventilation. Fan and mine characteristics. Ventilation network analysis. Mine

ventilation design and problem analysis. Laboratory. Prerequisite: 410 and Engineering 313.

430-3 Economics of Mineral Resources. Economics of mineral resources. Investment decision making criteria; economic viability of mining projects, financing mining projects; sensitivity and risk analyses. Prerequisites: 400, ENGR 361, or consent of instructor.

431-3 Rock Mechanics and Ground Control. Analysis of stress and strain, elementary elasticity, stress distribution around mine openings and pillars, engineering properties of rocks, support of mine workings, subsidence, design of mine openings. Laboratory. Prerequisite: 410 and Engineering 311.

435-3 Operations Research and Computers in Mine Design. Mine systems analysis, operations research and statistics in decision making, production engineering, mine planning, optimization, linear programming, computer simulation. Prerequisite: 410, 415, or 418, Engineering 222 and 361.

440-3 Design of Material Handling Systems. Study of material handling systems selection. Systems design and development. Material handling economics. Prerequisite: 410, 415 or 418 or concurrent enrollment, Engineering 361.

455-2 Mine Health and Safety Engineering. Analysis of mine hazards and accidents, sealing and recovery of mines, design of mine emergency plans, safety methods, and health hazard control plans. Prerequisite: 410 and 415 or 418.

460-3 Computer-Aided Underground Mine Design Projects. Projects in planning and design of underground mining systems. Evaluate and design mining subsystems; integrate subsystems and procedures into a preliminary mine design; and optimize operations from exploration to closure. One lecture and two two-hour laboratories per week. Prerequisite: 420, 425, 431, 440, or consent of instructor.

465-3 Computer-Aided Surface Mine Design Projects. Projects in planning and design of surface mining systems. Evaluate a potential mine site; select appropriate mining methods; define and design mining and reclamation subsystems; integrate subsystems and procedures into a preliminary mine design; and optimize operations from exploration to bond release. One lecture and two two-hour laboratories per week. Prerequisite: 415 or 418, 420, 431, 440, or consent of instructor.

470-3 Experimental Methods in Rock Mechanics. Supplement theoretical knowledge gained in 431 with laboratory experiments. Physical property tests for specific gravity, moisture, density porosity of rocks. Unconfined and confined compressive strength, tensile strength, shear strength, photoelasticity, static and dynamic strain measurement systems, field instrumentation techniques. Laboratory. Prerequisite: 431.

475-3 Design of Mine Excavations. Rock classification; design of shafts, slopes, tunnels, and underground chambers; support requirements; design of slopes; design of underground mining systems from ground control point of view; design of impoundments. Prerequisite: 415 or 418 and 431.

492-1 to 5 Special Problems in Mining Engineering. Topics and problems selected either by the instructor or the student with the approval of the instructor. Five hours maximum course credit. Prerequisite: senior standing and consent of instructor.

511-3 Advanced Ground Control. Ground control in viscoelastic, plastic, and jointed rocks, artificial rock stabilization, in-situ stresses, minimizing structural damage due to subsidence, bumps, and rock bursts. Prerequisite: 431 or consent of instructor.

519-2 Advanced Mine Environment and Pollution Control. Study of the design of coal dust control plan; methane control. Design of mine illumination system, noise control, and water pollution control. Prerequisite: 410, 415.

530-3 Mine Management. Study of basic management principles, labor relations, and coal wage agreement. Costing methods and cost control. Operations organization and performance analysis. Prerequisite: consent of instructor.

535-3 Rock Fragmentation. Principles of rock fragmentation, cutting and drilling, mechanics of rock penetration, drillability indices, use of explosives in rock fragmentation, design of blasing patterns in surface and underground mines, prevention of airblast and noise due to blasting, chemical fragmentation. Prerequisite: 415, 431, or consent of instructor.

540-3 Production Engineering in Coal Mines. Operations analyses of production cybles in surface and underground coal mining systems, mine planning and design using computer models, computer simulation, economic analysis of mining systems. Prerequisite: 435 or consent of instructor.

545-3 Tunnelling. Tunnelling through consolidated and unconsolidated geologic materials—cut and cover, drilling and blasting, and rapid excavation tunnelling techniques. Classification systems for geologic materials, hydrological investigations, tunnel linings—types, requirements, and their design. Instrumentation. Prerequisite: 431, or equivalent, or consent of instructor.

580-1 to 2 Seminar. Collective and/or individual studies in coal extraction or utilization.

592-1 to 5 Special Investigations. Special studies of coal extraction or utilization problems.

599-1 to 6 Thesis.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Molecular Science

592-1 Colloquy in Molecular Science. Required each semester of all resident students who have been admitted to advanced study in molecular science. Weekly conference on current research and recent literature of the field.

597-2 to 30 Selected Topics in Molecular Science. Prerequisite: consent of instructor.

598-2 to 16 Special Projects in Molecular Science. Prerequisite: admission to the molecular science doctoral program and consent of instructor. Graded *S/U* only.

600-1 to 36 (1 to 16 per semester) Dissertation. Hours and credit to be arranged by the chair. Prerequisite: admission to advanced study in molecular science.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Music

Courses in this department may require the purchase of music literature and other incidental supplies.

400-1 to 2 (1, 1) Performance Techniques. Individual instruction in any secondary applied field. Designed to provide added depth of preparation for teaching instrumental and vocal music. Prerequisite: completion of 340 level or the equivalent in some field of applied music.

407-2 Modal Counterpoint. Study of Renaissance contrapuntal techniques. Extensive writing practice, and analysis of stylistic models. Prerequisite: 207.

410-2 Piano Pedagogy Practicum. Provides undergraduate and graduate piano pedagogy majors with the opportunity for supervised practice piano teaching. Course activities include lesson-planning, conducting and evaluating studio piano and class piano lessons, and a survey of important educational issues that impact on effective piano teaching. Prerequisite: consent of instructor.

414-1 to 8 (1 to 2 per semester) Collegium Musicum. For experienced singers and instrumentalists. Emphasis upon practical study of historical music literature of the Medieval, Renaissance, and Baroque eras.

421-2 Advanced Analysis. Structure, form, and design in music as the coherent organization of all of its factors. Analysis of works chosen from a variety of styles and genres. Prerequisite: 321.

430-1 Jazz Arranging. Methods of scoring for popular groups. Practice in scoring arrangements and/or original compositions for jazz ensembles. Prerequisite: 335a and b or consent of instructor.

440-1, 2, or 4 Applied Music. (See Music 040.)

447-4 (2, 2) Electronic Music. (a) Introduction to classical studio equipment and techniques; use of voltage controlled equipment. Individual laboratory experience available. **(b)** Emphasis upon creative projects, more sophisticated sound experimentation, and analysis. Enrollment limited. Must be taken in a,b sequence. Prerequisite: 280 or consent of instructor.

453-2 to 4 (2 per semester) Advanced Topics in Choral Music. Practicum in the selection, rehearsal, and performance of appropriate literature. Study of techniques for achieving proficient performance and musical growth. For experienced teachers and advanced students.

454-2 to 4 (2 per semester) Advanced Topics in Instrumental Music. Practicum in the selection, rehearsal, and performance of appropriate literature. Study of techniques for achieving proficient performance and musical growth. Designed for experienced teachers and advanced students.

455-2 to 4 (2 per semester) Advanced Topics in Elementary School Music. Practicum in the selection and use of materials for the elementary school program. Study of techniques for achieving balanced musical growth. For experienced teachers and advanced students.

456-4 (2, 2) Music for Exceptional Children. (a) Theories and techniques for therapeutic and recreational use of music with physically and mentally handicapped children. Includes keyboard, autoharp, guitar, and tuned and untuned classroom instruments. **(b)** Applications for the gifted, emotionally disturbed, and culturally disadvantaged child. Take in sequence. Prerequisite: 302 or prior consent of instructor.

461-3 Applied Music Pedagogy. Specialized problems and techniques employed in studio teaching of any particular field of music performance. Study of music literature appropriate for the various levels of performance. Opportunity, as feasible, for supervised instruction of pupils. Meets with appropriate instructor, individually or in groups.

468-2 to 4 (2, 2) Music Productions. Practicum in the techniques for staging operas and musicals.

472-2 Chamber Music Literature. A study of literature for the principal types of chamber music groups.

475-3 Baroque Music. The development of vocal and instrumental music in the period 1600-1750, from Monteverdi to Bach and Handel. Oratorio and Cantata, the influence of opera, sonata, suite, and concerto. Prerequisite: 357a with a grade of *C* or better, or graduate standing.

476-3 Classical Music. Development of the sonata, symphony, concerto, and chamber music in the 18th and early 19th centuries, with emphasis on the music of Haydn, Mozart, and Beethoven. Prerequisite: 357b with a grade of *C* or better, or graduate standing.

477-3 Romantic Music. Development of the symphony and sonata forms, chamber music, and vocal music in the 19th and early 20th centuries. Rise of nationalism and impressionism. Prerequisite: 357b with a grade of *C* or better, or graduate standing.

479-2 to 4 (2 per topic) Solo Performance Literature. Topics presented will depend upon the needs of students and upon instructors scheduled. **(a)** Piano literature, including an introductory study of harpsichord music; **(b)** organ literature, in relation to the history of the instrument; **(c)** song literature; **(d)** guitar and lute literature; **(e)** solo string literature; **(f)** solo wind literature.

480-2 to 4 (2, 2) Advanced Composition. Original composition involving the larger media. Individual instruction. Prerequisite: two semesters of 380 with a grade of *C* or better and approval of composition jury.

481-1 to 4 Readings in Music Theory. Assigned readings and reporting of materials pertaining to a particular phase of music theory in historical perspective. Approximately three hours' preparation per week per credit (adjusted for shorter sessions). Prerequisite: 321 and 322 or prior consent of instructor.

482-1 to 4 Readings in Music History and Literature. Assigned readings and reporting of materials pertaining to a particular phase of history or literature. Approximately three hours preparation per week per credit. Prerequisite: 357a and b, or prior consent of instructor.

483-1 to 4 Readings in Music Education. Assigned readings and reporting of materials pertaining to a particular phase of music education. Approximately three hours preparation per week per credit (adjusted for shorter sessions). Prerequisite: consent of instructor.

498-2 to 4 (2, 2) Recital. Preparation and presentation of a full solo recital in any applied field. Prerequisite: prior or concurrent registration in 440 and approval of applied jury.

499-1 to 8 Independent Study. Original investigation of selected problems in music and music education with faculty guidance. Project planned to occupy approximately three hours preparation per week per credit (adjusted for shorter sessions). Not more than three hours toward 30 required for graduate degree. Prerequisite: prior consent of selected instructor.

500-1 to 6 Independent Investigation. An opportunity for the graduate student to investigate at an advanced level special interests outside the scope of normal course offerings. The student will select a member of the graduate faculty to guide and evaluate the work. Not more than three hours toward 30 required for graduate degree. Prerequisite: prior consent of the selected instructor and student's graduate adviser.

501-3 Music Bibliography and Research. Bibliographic materials for graduate study in music theory, history, education, and music performance. Practical experience in research techniques and scholarly writing style. Recommended to be taken during the first semester of graduate study. Required of all degree programs.

502-4 (2,2) Analytic Techniques. Analysis of representative works chosen from the Baroque, Classical, Romantic, and Modern eras. Prerequisite: graduate standing in music or prior consent of instructor.

503-3 Scientific Evaluation and Research in Music. Quantified research concepts and vocabulary; measurement theory and techniques for evaluating and testing musical aptitude and achievement; investigation of acoustical perception; survey of current scientific research in music. A research project is required.

509-2 History and Philosophy of Music Education. The evolution of school music and its changing relationship to the individual, to society, and to the school curriculum.

510-6 (2,2,2) Piano Pedagogy Seminars. **(a)** Piano Technique. Provides an in-depth study of the three classic texts on the subject of piano technique and prepares students to deal with important aspects of piano technique in piano teaching. **(b)** Piano Literature. An extensive survey of baroque, classical, romantic and contemporary piano literature designed specifically to meet the needs of those pursuing professional careers as piano teachers. **(c)** Piano Music Analysis. Details the analytic and problem-solving techniques of piano performance study that are fundamental for teaching piano students of all ages and abilities.

535-2 Contemporary Idioms. An analysis of major compositional techniques since 1945. Prerequisite: 502b or consent of instructor.

540-1, 2, or 4 Applied Music. (See Music 440.)

545-3 Pedagogy of Music Theory. An orientation to the philosophy of theory with application to teaching techniques. Prerequisite: consent of instructor.

550-2 School Music Administration and Supervision. Study of the objectives and processes of music instruction. Administration roles in developing the means and ends of music instruction, and techniques employed for the improvement of instruction.

556-2 to 4 (2,2) Advanced Conducting. Individual or group study with appropriate instructor of choral, orchestral, or band literature. Practice in score reading, baton technique, and interpretation. Opportunity to rehearse and conduct ensembles when feasible. Prerequisite: completion of an undergraduate conducting course with graduate standing in music, or consent of instructor.

566-1 to 12 (1 or 2 per semester) Ensemble. Participation required each semester enrolled (summer excepted) in one or more of the ensembles listed below. In addition, students may elect participation in other regularly scheduled ensembles. One credit per group: maximum of two credits for concurrent participation in two groups. **(a)** Marching Salukis. **(b)** Symphonic band. **(c)** Concert wind ensemble. **(d)** Symphony. **(e)** Choral union. **(f)** Concert choir. **(g)** Chamber singers. **(h)** Guitar ensemble. **(i)** Opera workshop.

567-1 to 8 Music Theater Workshop. For experienced singers, actors, dancers, and instrumentalists. Normally offered during summer as a fulltime course for eight credits, or partial credit for the orchestral players. Prerequisite: audition.

568-1 to 16 (1 to 8 per semester) Opera Workshop. Open to all experienced singers and stage technicians. Performs one major work and two or more excerpt programs per year. Normal registration is for two credits; four credits with permission for those with major roles; eight credits for full time summer workshop.

570-3 History of Opera. The development of the music, libretti, and staging of opera from the late Renaissance to the present, with a detailed study of selected works. Prerequisite: for non-music majors: prior consent of instructor.

573-3 Medieval Music. Music of the medieval world; Gregorian chant; the Tropes; secular songs of the troubadours and trouveres; the rise of polyphony; Ars Antiqua; organum and conductus; Ars Nova; Dunstable and English descant up to about 1450; types of notation. Prerequisite: for non-music majors: prior consent of instructor.

574-3 Renaissance Music. Burgundian and Netherlands music from 1450 and its spread; Isaac and Josquin; 16th Century polyphony in France, Germany, Spain, and England; the rise of music for instruments and for solo voices. Prerequisite: for non-music majors; prior consent of instructor.

578-3 Twentieth Century Music. The heritage of 20th century music. Study and analysis of musical philosophies and techniques of post-impressionist and contemporary composers. Prerequisite: for non-music majors: prior consent of instructor.

580-2 to 4 (2,2) Graduate Composition. Composition in the larger forms for solo and ensemble performance. Prerequisite: 480 or prior consent of instructor.

595-2 Music Document. A written report presenting the history and style of works performed in graduate recital, MUS 598, or other topic relating to the student's principal performing area or independent study project. Prerequisite: 501 and approval of topic by the music graduate committee. On recommendation of the composition faculty and with graduate committee approval, a piece of music composed by the student for performance in MUS 598 may be substituted, accompanied by a written analysis.

598-4 Graduate Recital. Preparation and presentation of a full solo recital in any area of performance; or the preparation, rehearsal, and conducting of a full ensemble program or of the equivalent sections of several ensemble programs. Prerequisite: completion of at least four credits in 540 (or 556 for conductors) and the approval of the performance jury. The performance jury certifies the acceptability of the completed recital and the grade to the graduate committee.

599-2 to 6 Thesis. An intensive written study in the history, theory, teaching, or philosophy of music; or the manuscript and parts (with tape recording when feasible) of a substantial musical composition or series of compositions accompanied by an analytical or explanatory document. Graded *S/U* or *DEF*. Prerequisite: 501 and prior approval of topic or proposal by thesis director and graduate committee in music.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Pharmacology

500-1 to 16 Pharmacology Seminar. Presentation of research and current literature in pharmacology. Required of all graduate students in pharmacology. Requires presentation at a Journal Club session each fall semester and a formal seminar each spring semester for duration of registration. Graded *S/U* only. (SPRINGFIELD ONLY.)

550-8 (4,4) Principles of Pharmacology. A study of chemistry, pharmcodynamic actions, mechanisms of action, absorption, distribution, metabolism, elimination, adverse effects, interactions, and toxic effects of drugs currently used in therapeutics. Three to five hours lecture, one to four hours discussion per week. Must be taken in sequence. Prerequisite: organic chemistry, biochemistry, basic courses in physiology, and PHSL 420a,b or equivalent are highly recommended, or consent of coordinator. (SPRINGFIELD ONLY.)

551-4 Methods in Pharmacology. The main objective is to acquaint the student with various sophisticated laboratory equipment, basic techniques/principles of pharmacological experiments. One hour lecture and three hours laboratory twice weekly. This course is prerequisite to all advanced pharmacology courses. (SPRINGFIELD ONLY.)

552-3 Applied Statistics for the Basic Sciences. This course reviews introductory statistics and focuses on advanced statistics, linear and nonlinear modelling, applicable to basic bimedical sciences. The course will also provide students with experience in the use of statistical package computer programs for data analysis. Prerequisite: a college level introductory statistics course or permission from the instructor.

555-3 Cardiovascular Pharmacology. A study of structure, biochemistry, electrophysiology, and neurogenic and humoral regulation of the cardiovascular system in normal and diseased states. Three hours of lecture per week. Prerequisites: 550a,b or equivalent, or consent of course coordinator. (SPRINGFIELD ONLY.)

560-3 Geriatric Pharmacology. A study covering age-related changes in the physiology of particular organ systems which lead to the prevalence of many diseases and to altered drug action in the elderly. Research issues in aging will be discussed emphasizing the biological substrates of altered pharmacodynamics and pharmacokinetics in the aged. Prerequisite: 550a,b and consent of course coordinator. (SPRINGFIELD ONLY.)

565-3 Principles of Toxicology. This course deals with principles and understanding of phenomena of chemical-biologic interactions; a study of adverse chemical effects on living organisms and risk that chemical exposure poses to man/environment; deleterious, acute, chronic chemical effects on specific organs, tests to predict risks, facilitate search for safer chemicals and drugs and means of rational treatment of manifestations of toxicity; prominent discussion on drugs, medical devices, food additives, pesticides; regulation of toxic chemicals, hazardous wastes, toxic pollutants in water and air; and emphasis on diseases caused by and uniquely associated with drugs, diagnosis and treatments of such intoxicants. (SPRINGFIELD ONLY.)

574-3 Neuropharmacology. (Same as Physiology 574.) A detailed examination of the biochemical aspects of neuropharmacology with emphasis on neurotransmitters; their synthesis, storage, release, and metabolism in the central and peripheral nervous system. Considerable emphasis is placed on major research developments (both past and present) that influence how one studies the action of drugs on the nervous system. Prerequisite: PHSL 410 and CHEM 451.

590-1 to 24 Readings or Research in Current Pharmacological Topics. By special arrangement with the instructor with whom the student wishes to work. Graded *S/U* only.

599-1 to 6 Thesis Research. Research for thesis for a master's degree. Hours and credit to be arranged by chairman and adviser.

600-1 to 32 (1 to 12 per semester) Dissertation Research. Research for dissertation for the Ph.D. degree. Hours and credit to be arranged by chairman and adviser.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Philosophy

400-3 Philosophy of Mind. An investigation of the philosophic issues raised by several competing theories of mind, focusing on the fundamental debate between reductionistic accounts (e.g., central state materialism, identity theories of the physical and mental) and views which reject such proposed reductions. Traditional and contemporary theories will be examined. Designed for students in the life and social sciences with little or no background in philosophy as well as philosophy students.

415-3 Logic of Social Sciences. (Same as Sociology 415.) Logical and epistemological examination of the social sciences as types of knowledge. Basic problems in philosophy of science with major emphasis upon social science: relationship of theory to fact, nature of induction, nature of causal law, testability, influence of value judgments, etc. Intended for students with considerable maturity in a social science or in philosophy.

420-3 Advanced Logic. Study of the main forms of sentence and predicate logic, including topics in the philosophy of logic.

422-3 Semiotic. (Same as Speech 447.) Introduction to Semiotic as the general theory of signs, including natural signs, signals and linguistic expressions. Concentration on contrasts and comparisons between language and more primitive types of signs.

425-3 Philosophy of Language. (Same as Speech Communication 465.) Introduction to basic problems in the philosophy of language, including alternative theories of meaning and reference and the relation between meaning and intention.

430-3 Epistemology. An introduction to basic problems in epistemology, including the nature, sources, and units of knowledge, the debates concerning foundationalism, correspondence versus coherence theories of truth and perception.

435-4 Philosophy of Science. Critical survey of influential description of scientific method and theory construction. Topics include the relationship between observation and theory confirmation, explanation, and prediction, theory of change and discovery, view of scientific rationality. Historical cases will serve to focus the discussions.

441-4 Philosophy of Politics. (Same as Political Science 403.) Some of the central problems of modern political life, such as sovereignty, world government, authority and consent, the relation of economic and social studies to political theory. Prerequisite: 340 or GEC 102 or consent of instructor.

443-4 Philosophy of History. Classical and contemporary reflections on the nature of history and historical knowledge as the basis for dealing with the humanities. Prerequisite: consent of instructor.

446-3 Philosophical Perspectives on Women. (Same as Women's Studies 456.) Discussion of contemporary views of women and social issues from a feminist perspective.

460-4 Philosophy of Art. The definition of art, its relation to science, culture and morals; the various types of art defined. Familiarity with at least one of the fine arts is assumed.

470-6 (3, 3) Greek Philosophy. **(a)** Plato; **(b)** Aristotle. Prerequisite: 304 or consent of instructor.

471-4 Medieval Philosophy. Prerequisite: 304 or consent of instructor.

472-4 The Rationalists. Study of one or more of the following: Descartes, Malebranche, Spinoza, Leibniz, Wolff. Prerequisite: 305 or consent of instructor.

473-6 (3, 3) The Empiricists. **(a)** Locke; **(b)** Hume. Prerequisite: 305 or consent of instructor.

474-9 (3, 3, 3) 19th Century Philosophers. **(a)** Kant; **(b)** Hegel; **(c)** Marx. Prerequisite: 306 or consent of instructor.

475-3 Chinese Philosophy. Confucianism, Taoism, or Buddhism. Emphasis on comparison of philosophy East and West.

482-3 Recent European Philosophy. Philosophical trends in Europe from the end of the 19th Century to the present. Phenomenology, existentialism, the new Marxism, structuralism, and other developments. Language, history, culture and politics.

486-3 Early American Philosophy. From the Colonial period to the Civil War.

487-3 Recent American Philosophy. Thought of realists, idealists, and pragmatists, such as Royce, Santayana, Peirce, James, Dewey, and others.

490-2 to 8 Special Problems. Hours and credits to be arranged. Courses for qualified students who need to pursue certain topics further than regularly titled courses permit. Special topics announced from time to time. Students are invited to suggest topics. Prerequisite: consent of department.

500-3 Metaphysics. Recent writers and current problems in metaphysics.

501-3 Philosophy of Religion. Analysis of a problem in philosophical theology or the phenomenology of religion, or of the work of a particular thinker.

524-6 (3,3) Analytic Philosophy. Analytic philosophy of people such as Austin, Russell, Ayer, Wittgenstein, G. E. Moore. **(a)** Early. **(b)** Recent.

530-3 Theory of Knowledge. A contemporary writer or problem in epistemology. Emphasis on problem of reliability and structure of scientific knowledge.

531-3 Whitehead. Study in depth of a selected aspect or problem in Whitehead's philosophy.

542-3 Political and Legal Philosophy. Relations of law, morality, and politics, and consideration of problems and issues in philosophy of law.
545-3 Ethics. Recent British and American ethical theory.
560-3 Aesthetics. Selected topics or writings.
562-3 Philosophy of Human Communication. (See Speech Communication 562.)
570-3 American Idealism. One or more American idealists. Recent seminars have been devoted to the thought of Brand Blanshard and Peter A. Bertocci.
575-3 to 9 (3 per topic) Contemporary Continental Philosophy. Topics in phenomenology, existentialism, and structuralism as developed from Husserl to Derrida. May be repeated as the topic varies.
577-6 (3,3) Pragmatism. (a) Peirce and James. **(b)** Dewey and Mead.
581-3 Plato. Through study of selected dialogues and reconstruction of Plato's system as a whole. Discussions and reports.
582-3 Aristotle. Intensive reading on several texts, analyzing selected portions of Aristotle's thought.
587-3 Kant.
588-3 Hegel.
590-2 to 12 (2 to 4 per topic) General Graduate Seminar. Selected topics or problems in philosophy. Graded *S/U* only.
591-1 to 16 Readings in Philosophy. Supervised readings for qualified students. Prerequisite: consent of instructor.
599-2 to 6 Thesis. Minimum of four hours to be counted towards a master's degree.
600-3 to 32 (1 to 16 per semester) Dissertation.
601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Physical Education

Courses in this department may require the purchase of supplemental materials.

400-3 Evaluation in Physical Education. Historical background of measurement in physical education; selection and evaluation of contemporary testing devices (predominantly tests of motor skill); structure and use of tests; administering the testing program; and statistical manipulation and interpretation and application of results.
403-3 Individualizing Physical Education Instruction for Students with Special Needs. Designed as an introductory survey of handicapping conditions found most often in the regular class setting with implications for physical education instruction. Emphasis is placed on a diagnostic-prescriptive teaching model. Students will learn to plan, implement, and evaluate quality physical education services to handicapped students. Prerequisite: graduate standing or consent of instructor.
407-2 Advanced Theory and Techniques in the Prevention and Rehabilitation of Athletic Injuries. The application of scientific principles to the theoretical and practical methods of preventing and treating athletic injuries. Prerequisite: basic athletic training course.
408-2 Physical Fitness: Its Role and Application in Education. An analysis of physical fitness as it relates to the total well-being of people. Specific units on the fitness parameters, hypokinetic disease and physical inactivity, stress, current level of fitness, training programs, and the beneficial aspects of regular exercise. Major emphasis is placed upon incorporating current thinking on physical fitness into the development of teaching models.
409-3 Social Aspects of Sport and Physical Activity. This course presents an analysis of the social implications of sport on society and includes consideration of sports in relation to sexual identifications, women, minority groups, politics, political activism, social deviance, and other related areas.
410-3 Behavioral Analysis of Sport. Application of sport psychology principles and theories to athletic situations in order to better understand sport related behavior. Behavioral problems related to sport are discussed, with a goal of enhancing athletic performance through the creation of a positive sport environment.
415-1 to 6 (1 per topic) Workshop in Sports. A concentrated experience in the latest theories and techniques of selected sports activities. Emphasis is placed on individual and team drills, instructional materials and improved teaching methods. One semester hour for each workshop. A total of four hours only of such workshop experience may be credited toward the master's degree. Workshop titles are: **(a)** Baseball. **(b)** Basketball. **(c)** Field hockey. **(d)** Football. **(e)** Gymnastics. **(f)** Soccer. **(g)** Softball. **(h)** Swimming. **(i)** Track and field. **(j)** Volleyball. **(k)** Tennis. **(l)** Athletic training.
418-2 Administration of Aquatics. The study of comprehensive aquatic programs, their implementation and coordination.
420-3 Physiological Effects of Motor Activity. The general physiological effects of motor activity upon the structure and function of body organs; specific effect of exercise on the muscular system. Requires purchase of laboratory manual. Prerequisite: Physiology 209 or equivalent.
425-2 Current Topics in Athletic Training. This course is designed to study and discuss current issues in athletic training and the health care of the athlete.
426-2 Advanced Techniques and Research in Therapeutic Modalities. Specifically designed for the student who wishes to become an athletic trainer and gain knowledge in the application and current research in therapeutic modalities.
493-2 to 4 Individual Research. The selection, investigation, and writing of a research topic under supervision of an instructor. **(a)** Dance. **(b)** Kinesiology. **(c)** Measurement. **(d)** Motor development. **(e)** Physiology of exercise. **(f)** History and philosophy. **(g)** Motor learning. **(h)** Psycho-social

aspects. Written report required. Prerequisite: consent of adviser and department chairperson.

494-2 (1, 1) Practicum in Physical Education. Supervised practical experience at the appropriate level in selected physical education activities in conjunction with class work. Work may be in the complete administration of a tournament, field testing, individual or group work with special populations, administration of athletics or planning physical education facilities. Prerequisite: consent of adviser.

500-3 Techniques of Research. Study of research methods and critical analysis of research literature specifically applied to the areas of motor performance and exercise. Prerequisite: consent of adviser in the Department of Physical Education.

503-2 Seminar in Physical Education. Making a systematic analysis of problems and issues encountered in the conduct of physical education. Selection of a problem or issue that is a concern to physical education and suggestion of solutions.

505-2 to 6 (2 per topic) Topical Seminar in Physical Education. Students may concentrate on different topics each semester dependent upon both the interests of the students and the expertise of the graduate faculty. Prerequisite: consent of instructor.

508-2 Administration of Athletics. Designed to present a broad view of the role of athletics in its relationship to the total educational program, and to examine current practices in athletic management which operate within a framework of recommended policies and rules which govern athletics.

509-3 Administrative Theory and Practice in Physical Education. Selected administrative processes in physical education and the application of theory to the processes. The course attempts to systematize concepts, insights, and propositions into a usable form, to increase the understanding of administrative problems, and to expand existing knowledge and thought about behavioral phenomena. Prerequisite: 503 for those with an administrative emphasis.

510-3 Motor Development. Indepth study of the development of gross motor skills from infancy through adolescence, the biological and environmental variables that affect motor development, and individual differences in attaining motor proficiency. In addition, selected current issues in motor development will be examined. No prerequisite.

511-3 Analysis of Human Physical Movement. Principles and procedures for qualitative analysis and the teaching of mechanical constructs for movement activities. The student completes a cinematographic analysis. Prerequisite: 303 or equivalent.

512-3 Biomechanics of Human Motion. Methods of data collecting and analyzing the biomechanics of human motion under normal and pathological conditions are covered. Students complete a biomechanical study for a one segment motion.

513-3 Perceptual Motor Learning of Physical Skills. Principles of learning applied to motor performance. Variables that affect learning of physical skills.

514-3 Seminar: Motor Skill Learning and Performance. In-depth seminar investigating the behavioral factors associated with the performance of physical skills. Current experimental and theoretical literature concerning selected topics emphasized. Prerequisite: 513.

515-3 Body Composition and Human Physical Performance. Physical dimensions of the human body as they influence motor performance and are modified by protracted physical exercise. Prerequisite: 420 or equivalent.

517-2 Athletic and Physical Education Facilities Design, Construction, and Maintenance. Basic principles of design, construction, and maintenance of athletic and physical education facilities based upon program characteristics and potential student enrollment. Emphasis on the development of new materials and trends toward new concepts of design and construction. Prerequisite: 357 or equivalent.

520-3 Metabolic Analysis of Human Activity. Metabolic principles pertinent to human physical performance with emphasis on sport, exercise, and occupational activity analysis. A detailed study of oxygen utilization, oxygen debt, mechanisms of oxygen transport as they relate to physiological homeostasis in localized and total body motor activity. Emphasis on the laboratory study of aerobic and anaerobic performance. Prerequisite: 420 or equivalent.

530-1 to 4 (1,1,1,1) Seminar in Research in Human Performance. Special problems in research on human performance, in depth review of research on topics of specific interest, presentation, and evaluation of research proposals. Required for Ph.D. candidates. Must be taken for four consecutive semesters and in conjunction with 592 for the last three of these semesters. Graded *S/U* only.

555-1 to 4 Internship in Sport Management. The internship is a culminating experience directly related to the student's intended employment or area of interest. It will, therefore, normally be taken after the predominance of course work is completed. The internship may be completed in any appropriate setting as judged by the faculty associated with the area of sport management. All conditions of placement, conduct, and evaluation of the internship will be under the jurisdiction of the appropriate faculty. Graded *S/U* only.

560-3 Gender and Sport: Sociological and Psychological Perspectives. (Same as WMST 560). This course explores psychological and sociological dimensions underlying the concept of gender and critically examines how gender relates to sport and physical activity. Students will be introduced to non-traditional as well as traditional research that addresses the issue of gender in various physical activity contexts.

590-1 to 4 Readings in Physical Education. Supervised readings in selected subjects. Prerequisite: consent of adviser and department chair.

592-2 to 8 Research in Physical Education. Plan, conduct, and report assigned research studies. Masters students may take up to three credit hours. Doctoral students must enroll for a minimum of six credit hours. Graded *S/U* only. Prerequisite: 500 or equivalent, consent of instructor.

599-3 to 6 Thesis. Prerequisite: 500 or equivalent.

600-1 to 32 (1 to 16 per semester) Dissertation. Minimum of 24 hours to be earned for the Doctor of Philosophy degree.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Physics

410-3 Mechanics II. Gravitation, continuous media, transformation properties, Lagrangian and Hamiltonian formalisms. Prerequisite: 310 or consent of instructor.

420-3 Electricity and Magnetism II. Induced electromotive force, quasisteady currents and fields, Maxwell's equations, electromagnetic waves and radiation, with applications. Prerequisite: 320 or consent of instructor.

424-3 Digital Electronics for the Scientist. Coordinated two-hour lecture and two-hour laboratory study of digital electronics, microprocessors and minicomputers with emphasis on their application to the experimental research laboratory setting. Topics include Boolean algebra, basic digital techniques, large scale integration devices, analog to/from digital conversion, microprocessors and minicomputers, and data acquisition. Prerequisite: 324 or consent of instructor.

425-3 Solid State Physics I. Structure of a crystalline solid; lattice vibrations and thermal properties; electrons in metals; band theory; electrons and holes in semiconductors; opto-electronic phenomena in solids; dielectric and magnetic properties; superconductivity. Prerequisite: 310, 320, 345, and 430 or consent of instructor.

428-3 Modern Optics and Lasers. Properties of electromagnetic waves in space and media, polarization and interference phenomena and devices, electro- and magneto-optic effects, optical gain, and lasers. Prerequisite: 420 or consent of instructor.

430-3 Quantum Mechanics I. An introduction to quantum mechanics including its experimental basis and application in atomic physics. Prerequisite: 205c, 310 and 320. Prior or concurrent enrollment in 410 and 420 is desirable.

431-3 Atomic and Molecular Physics I. Atomic spectra and structure; molecular spectra and structure. Prerequisite: 430 or consent of instructor.

432-3 Nuclear Physics I. Basic nuclear properties and structure; radioactivity, nuclear excitation, and reactions, nuclear forces; fission and fusion. Prerequisite: 430 or consent of instructor.

445-3 Statistical Mechanics I. An introductory course in the principles and applications of classical and quantum statistical mechanics, and the elementary kinetic theory of matter. Prerequisite: 345.

450-1 Modern Physics Laboratory. Introduces students to experimental research and encourages them to develop and carry out experiments. Prerequisite: 205c or consent of instructor.

458-2 Laser and Optical Physics Laboratory. Properties of laser beams and resonators, fluorescence and two photon spectroscopy, diffraction, Fourier transformation and frequency filtering, electro- and magneto-optic modulation, fiber propagation and related experiments. Prerequisite: 428 or consent of instructor.

460-8 (4, 4) Physical and Applied Acoustics. Coordinated lecture and laboratory study in acoustical phenomena. Topics include vibration analysis, wave mechanics, two and three dimensional propagation and applications in physics, materials science, engineering, architecture, music, and environmental science. Emphasis on laboratory and field techniques with modern computer analysis. Prerequisite: 301 or Mathematics 305 or concurrent enrollment.

470-1 to 3 Special Projects. Each student chooses or is assigned a definite investigative project or topic. Prerequisite: 310, 320 or consent of instructor.

500-6 (3,3) Mathematical Methods in Physics. Vector spaces and operators in physics. Hilbert spaces and complete orthonormal sets of functions. Elements and applications of the theory of analytic functions. Methods for the solution of partial differential equations of physics. Prerequisite: MATH 407 or equivalent, consent of instructor.

510-4 Classical Mechanics. Generalized coordinates and forces. Lagrangian, Hamiltonian, and variational formulations of mechanics. Central forces, oscillations; normal modes of molecular systems. Prerequisite: 410.

511-3 Mechanics of Deformable Bodies and Fluids. Theory of stress, strain, and deformation in solids and the equations of flow in liquids and gases. Prerequisite: 510.

520-6 (3,3) Electromagnetic Theory. Determination of static, electrostatic, and magnetostatic fields. Microscopic and macroscopic theory of insulators and conductors. Maxwell's equations; radiation, propagation and scattering of electromagnetic waves. Electrodynamics and special theory of relativity. Selected topics. Prerequisite: 420.

530-6 (3,3) Quantum Mechanics II. Basic principles; the harmonic oscillator and the hydrogen atom; scattering; approximation and perturbation methods; spin, statistics. Prerequisite: MATH 406 or consent of instructor; 500 desirable.

531-6 (3,3) Advanced Quantum Mechanics. Quantum theory of radiation; applications of field theory to elementary particles; covariant quantum electrodynamics; renormalization; special topics. Content varies somewhat with instructor. Prerequisite: 530 and consent.

535-6 (3,3) Atomic and Molecular Physics II. Recent experimental methods in atomic and molecular spectroscopy with applications. Detailed quantum mechanical and group theoretical treatment of atomic and molecular systems. Reactions between atomic systems. Prerequisite: consent of instructor.

545-6 (3,3) Statistical Mechanics II. Principles of classical and quantum equilibrium statistics; fluctuation phenomena; special topics in equilib-

rium and non-equilibrium phenomena. Prerequisite: 445.

560-6 (3,3) Nuclear Physics II. Fundamental properties and systematics of nuclei, scattering theory, nuclear two-body problem, nuclear models, nuclear many-body problem, electromagnetic properties of nuclei, radioactivity, nuclear reactions. Prerequisite: 530 and consent of instructor.

565-6 (3,3) Solid State Physics II. Fundamental concepts in solid state physics. Lattice vibrations, band theory of solids, the Fermi surface, dynamics of electrons. Transport, cohesive, optical, magnetic, and other properties of solids. Prerequisite: consent of instructor.

570-1 to 12 (1 to 4 per semester for a maximum of three semesters) Special Projects in Physics. Each student works on a definite investigative topic under the supervision of a faculty sponsor. The projects are taken from the current research in the department. Resourcefulness and initiative are required. Prerequisite: consent of instructor.

571-6 (3,3) X-Ray Diffraction and Electron Microscopy. (See Mechanical Engineering 504.)

575-1 to 12 (1 to 4 per topic for a maximum of three topics) Special Topics in Physics. The courses reflect special research interests of the faculty and current developments in physics. They are offered as the need arises and interest and time permit. Students are required to give presentations. Prerequisite: consent of instructor.

581-1 to 3 (1,1,1) Graduate Seminar. Lectures on special topics by students, faculty, or invited scholars; participation is required of all graduate students. For credit each student may present a seminar in the form of a lecture on a theoretical or experimental topic, a demonstration experiment, or apparatus critique. Prerequisite: lecturing experience or concurrent teaching. Graded *S/U* only.

599-1 to 6 Thesis.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Physiology

400-6 (3, 3) Concepts in Anatomy. A detailed survey of human anatomy for preprofessional students with an interest in the biomedical disciplines, including radiographic, cross-sectional, and developmental anatomy. Three lectures per week. Should be taken in a,b sequence. Prerequisite: 301 and senior standing or consent of instructor.

401-6 (3, 3) Advanced Human Anatomy Laboratory. Laboratory dissection of the human body (six hours per week). Primarily for students majoring in physiology or other biological sciences, anthropology, etc. Prerequisite: 400 taken concurrently or prior enrollment in 401.

410-10 (5, 5) Mammalian Physiology. Physical and chemical organization and function in mammals, with emphasis on the human. Physiology of blood and circulation, respiration, digestion, metabolism, excretion, endocrines, sensory organs, nervous system, muscle and reproduction. Primary course for all students majoring in physiology or related sciences. Four lectures and one three-hour laboratory session per week. May be taken in any sequence. Prerequisite: college level chemistry and physics and at least junior standing.

411-4 (2, 2) Experimental Animal Surgery. **(a)** Covers animal care and preparation, anesthesia, etc.; one lecture and one two-hour laboratory per week. **(b)** Provides training and practice in surgical procedures. Two two-hour laboratories per week. Must be taken in a,b sequence.

420-6 (3, 3) Principles of Pharmacology. **(a)** Covers absorption, distribution, and metabolism of drugs and the action of certain drug classes on the living organism. Classes of drugs to be discussed include drugs affecting the autonomic nervous system, drugs used to treat neurological and psychiatric disorders, local anesthetics, neuromuscular blocking agents, and analgesics. Two lectures per week and one two-hour laboratory. Prerequisite: 310 or 410; 410 may be taken concurrently; organic chemistry. Some knowledge of biochemistry is needed. **(b)** Involves a discussion of the physiological and biochemical action of various classes of drugs. Classes of drugs to be discussed include general anesthetics, antihistaminics, diuretics, antibiotics, drugs used to treat cardiovascular disorders, and drugs affecting the endocrine system. Prerequisite: 420a; 310 or 410; organic chemistry.

430-4 (2, 2) Cellular Physiology. The nature and mechanisms of function of the living cell. Chemical and physical analysis of function at the cellular level. Two lectures per week. Prerequisite: organic chemistry.

433-6 (3, 3) Comparative Physiology. Variations of physiological processes in animal phyla, and comparison of these with human physiology. **(a)** Osmotic and ionic regulation; digestion, nutrition, and metabolism; excretion; respiration; defense and resistance. **(b)** Muscles and movement; circulation; nervous systems and sensory information; coverings and support; endocrine regulation; reproduction. Three lectures per week. Prerequisite: one year of biological science.

440-6 (3, 3) Biophysics. **(a)** Biomathematics, biomechanics and biotransport. **(b)** Bioelectrics and bio-optics applied to physiological problems. Three lectures per week. Prerequisite: Mathematics 141 or equivalent; one year of college biological science including Physiology 310 or its equivalent; one year of college physics. May be taken in b,a sequence with consent of instructor.

450-3 Vertebrate Endocrinology. A survey of the major endocrine control systems of vertebrates. Emphasis will be on those mechanisms which trigger endocrine responses to maintain homeostasis. Prerequisite: 310; concurrent enrollment in 410 or demonstrated equivalency; or consent.

460-2 Electron Microscopy. Lecture course designed to introduce the student to the theory and principles of electron microscopy. Two lecture

hours per week. Prerequisite: senior standing or permission of instructor.

462-3 Biomedical Instrumentation. (Same as Electrical Engineering 462.) Diagnostic and therapeutic modalities related to engineering. Cardiovascular, neural, sensory and respiratory instrumentation. Prerequisite: consent of instructor.

470-3 Biological Clocks. Study of the temporal aspects of diverse physiological and behavioral functions which possess diurnal and sectional periodicity. Species covered will include many eukaryotic organisms including plants, but will mainly stress mammals. Oscillations in sleep-wake cycle, locomotion, reproduction, hormonal secretion and numerous other processes will be explored. In addition, the effects of biological clocks in humans and the effect of jet lag and depression will be examined. Prerequisite: 310.

500-1 to 6 (1 per semester) Advanced Seminar in Physiology. Presentation of research and current literature in physiology. Required of all graduate students in physiology. Graded *S / U* only.

501-1 Presentation of Physiological Data. Students learn to prepare and deliver oral presentations of experimental findings in physiology, to organize the talk, prepare slides, and communicate effectively. Graded *S / U* only.

510-2 Experimental Methods in Physiology. The main objectives of this course are to acquaint the student with modern laboratory equipment, and principles of physiological experimentation. Prerequisite: consent of instructor.

530-3 Advanced Cellular Physiology. An advanced discussion of the following topics as they relate to the cell; release of energy, contractility, regulation and control of metabolism, electrical excitability, membrane transportation, water, and organelles. Prerequisite: consent of instructor.

531-2 Advanced Cellular Physiology Laboratory. One one-hour lecture and one three-hour laboratory per week, designed to be taken concurrently with 530. Basic experimental proceduress used in studies in cellular physiology.

533-4 Advanced Comparative Physiology. Advanced concepts and techniques used in current studies in comparative physiology. Three lectures and one discussion period per week.

540-3 Advanced Biophysics. Survey of recent biophysical research with emphasis on historical development of current advances. Three lectures per week. Prerequisite: 440 or its equivalent.

560-4 (2,2) Physiological Techniques. (a) Covers library research and basic laboratory methodology. **(b)** Covers *In Vivo* analytic instrumentation, BASIC programming and graphic techniques for physiology. Prerequisite: one year of biological science laboratory courses. Strongly recommended: one year of college physics; MATH 141 or equivalent. May be taken in b,a sequence with consent of instructor.

570-3 to 48 Advanced Physiological Topics. Studies of current research and literature in various topic areas of physiology. One or more of the following list of topic sections will be offered each semester, so that each section will be available once every two or three years. **(a)** Biological structure, **(b)** cardiovascular physiology, **(c)** respiratory physiology, **(d)** nerve-muscle physiology, **(e)** metabolism physiology, **(f)** gastrointestinal physiology, **(g)** neurophysiology, **(h)** radiation physiology, **(i)** environmental physiology, **(j)** biomathematics, **(k)** biomedical computing, **(l)** endocrinology, **(m)** animal care, **(n)** biophysics, **(o)** pharmacology, **(p)** special topics, **(q)** reproductive physiology, **(r)** renal physiology.

571-3 Research and Problems in Biological Transmission Electron Microscopy (TEM). Laboratory course designed to provide experience in techniques for biological electron microscopy. Student, with the aid of the instructor, designs and carries out a project in transmission electron microscopy. Two three-hour laboratories per week. Prerequisite: 460 or special permission of instructor.

572-3 Physiology of Fertilization. Considers mechanisms of sperm maturation and the structure and metabolic properties of the major spermatozoa. The molecular events thought to be involved in the development of motility and the ability to fertilize eggs will be discussed. Typical topics include gamete transport, sperm capacitation, the acrosome reaction and the function of the acrosome, sperm attachment to and penetration of the zona pellucida, sperm fusion with the eggs, metabolic changes associated with fertilization. Emphasis will be placed on discussion and evaluation of recent publications in the field. Prerequisite: 410 or equivalent, 400-level biochemistry or equivalent, or consent of instructor.

574-3 Neuropharmacology. (Same as Pharmacology 574.) A detailed examination of the biochemical aspects of neuropharmacology with emphasis on neurotransmitters—their synthesis, storage, release, and metabolism in the central and peripheral nervous system. Considerable emphasis is placed on major research developments (both past and present) that influence how one studies the action of drugs on the nervous system. Prerequisites: 410, and CHEM 450, or equivalent.

575-3 Neuroendocrinology. Designed to investigate and discuss the current research and historical aspects of the field of neuroendocrinology. In addition, designed to have students examine and evaluate current literature in the field and through discussion have them present their analysis of the research. One hour of lecture, one hour of discussion of textual material, one hour of multiple reports on library research. Prerequisite: 410a, b or equivalent, or an undergraduate/graduate endocrinology course, or consent of instructor.

590-1 to 4 Readings or Research in Current Physiological Topics. By special arrangement with the instructor with whom the student wishes to work. Graded *S / U* only.

598-1 to 48 (1 to 12 per semester) Research. The credit hours selected for this course registration will be determined by the major professor of the student. In a typical semester no more than six hours will be taken by a student except under special circumstances. Graded *S / U* only. Prerequisite: consent of instructor.

599-1 to 6 Thesis Research. Research for thesis for master's degree.

600-1 to 32 (1 to 16 per semester) Dissertation Research. Research for dissertation for Ph.D. degree.

601-1 per semester Continuing Enrollment. For those graduate students who have not

finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S / U* or *DEF* only.

Plant and Soil Science

Field trips are required for certain courses.

400-2 Trends in Agronomy. A discussion session format will be employed as a means of acquainting students with recent literature and allowing them to remain current with latest developments in their area of specialty. Prerequisite: senior standing.

405-3 Plant Breeding. Principles of plant breeding emphasized together with their application to the practical breeding of agronomic, horticultural, and forest plants. Field trip costs approximately $10. Prerequisite: 305 or equivalent.

408-3 World Crop Production Problems. Ecological and physiological factors influencing production in various areas of the world. Natural limitations on world crop production. Non-agricultural factors influence world crop output. Prerequisite: 200.

409-3 Crop Physiology and Ecology. The effects and significance of physiological and ecological parameters on crop yields. Prerequisite: Plant Biology 320 or consent of instructor.

419-3 Forage Crop Management. Forage crop production and utilization; forage crop characteristics, breeding, and ecology; grasslands as related to animal production, soil conservation, crop rotation, and land use. Field trip costs approximately $5.00. Prerequisite: Plant Biology 200 or one course in biology or equivalent.

420-4 Crop Pest Control. Study of field pests of forest; orchard, field, and garden crops; pest control principles and methods; control strategy; and consequences of pest control operations. Prerequisite: introductory biology or crop science course and/or consent of department.

422-3 Turfgrass Science. Basic concepts of physiology, growth, and nutrition of turfgrasses and their culture. Application of turfgrass science to management of special turf areas such as golf courses, athletic fields, and sod farms; and to the turfgrass industry. Field trips cost approximately $15. Prerequisite: 240 and 322 or equivalent or consent of instructor.

423-3 Greenhouse Management. Principles of greenhouse management controlling environmental factors influencing plant growth; greenhouses and related structures; and greenhouse heating and cooling systems. Field trips costing approximately $5. Prerequisite: 220 or consent of instructor.

424-4 Floriculture. Production, timing, and marketing of the major floricultural crops grown in the commercial greenhouse. Each student will have an assigned project. Field trip costing approximately $25. Prerequisite: 423 or consent of instructor.

428-6 (3, 3) Advanced Landscape Design. Theory and principles of residential landscape design. Practice in drawing residential landscape plans. **(a)** Emphasis on arrangement of unit areas. **(b)** Emphasis on details of design and selection of plants. Prerequisite: 328-4 or consent of instructor.

430-4 Plant Propagation. Fundamental principles of asexual and sexual propagation of horticultural plants. Actual work with seeds, cuttings, grafts, and other methods of propagation. Field trip costing approximately $5. Prerequisite: 220.

432-4 Nursery Management. Principles and practices involved in the propagation, production, and marketing of ornamental landscape plant materials. Emphasis on plant production with field trips to various production areas costing approximately $40. Prerequisite: 220 and 327a, or consent of instructor.

434-3 Woody Plant Maintenance. Care and management of ornamental shrubs and trees commonly used in the landscape. Topics to include trimming, pruning, fertilization, transplanting, and diagnosis of woody plant problems. Prerequisite: 327 or Forestry 202 or consent of instructor.

436-4 Fruit Production. Deciduous tree and small fruit growing, physiology, management practices, marketing. Prerequisite: 220 or consent of instructor.

437-4 Vegetable Production. Culture, harvesting, and marketing of vegetables; with morphological and physiological factors as they influence the crops. Field trip costing approximately $5. Prerequisite: 220 or consent of department.

441-3 Soil Morphology and Classification. Development, characteristics, and identification of soils, study of profiles; and interpretation and utilization of soil survey information in land use planning. Field trip costing approximately $5. Prerequisite: 240 or consent of instructor.

442-3 Soil Physics. A study of the physical properties of soils with special emphasis on soil and water relationships, soil productivity, and methods of physical analysis. Prerequisite: 240.

443-3 Soil Management. The soil as a substrate for plant growth. Properties of the soil important in supplying the necessary mineral nutrients, water and oxygen and for providing an environment conducive to plant root system elaboration. Soil management techniques that are important in optimizing plant growth. Prerequisite: 240.

445-3 Irrigation Principles and Practices. This course will cover basic principles of irrigation sciences; water requirements of crops; soil water relationship; water application methods including flooding, sprinkler, and drip (or trickle) systems; water conveyence, distribution and measurement; evaluation of irrigation efficiency; and irrigation scheduling. Considerations will also include crop production effects and economic aspects of irrigation. Prerequisite: 240 or consent of instructor.

446-3 Soil and Water Conservation. Covers the principles of hydrologic processes and soil erosion. Consideration will be given to the occurrence of soil erosion as it affects humans, food production, and the environment. The methods and technologies for protecting against and controlling

of erosion will also be discussed. Prerequisite: 240 and GED 107 or consent of instructor.

447-3 Fertilizers and Soil Fertility. Recent trends in fertilizer use and the implications of soil fertility build up to sufficiency and/or toxicity levels; the behavior of fertilizer material in soils and factors important in ultimate plant uptake of the nutrients; the plant-essential elements in soils and ways of assessing their needs and additions; tailoring fertilizer for different uses and management systems; implication of excessive fertilization in our environment. Prerequisite: 240; concurrent enrollment in 448 suggested.

448-2 Soil Fertility Evaluation. A laboratory course designed to acquaint one with practical soil testing and plant analysis methods useful in evaluating soil fertility and plant needs. One hour lecture, two hours laboratory. Prerequisite: 240; 447 or concurrent enrollment; or consent of instructor.

454-4 Microbial Processes in Soils. A study of microbial numbers, characteristics and biochemical activities of soil microorganisms with emphasis on transformations of organic matter, minerals, and nitrogen in soil. Prerequisite: 240 or Microbiology 301.

468-3 Weeds — Their Control. Losses due to weeds, weed identification and distribution, methods of weed dissemination and reproduction, mechanical, biological, and chemical control of weeds. State and Federal legislation pertaining to weed control herbicides. Herbicide commercialization. Field Trips costing approximately $5. Prerequisite: an introductory biology course.

470-2 Post Harvest Handling of Horticultural Commodities. Fundamental principles of post harvest physiology, handling, and evaluation of horticultural commodities will be covered. Specific details will be given on vegetable, fruit, ornamental, and floricultural commodities. Field trip costing approximately $30. Prerequisite: 220 and Plant Biology 320.

518-3 Principles of Herbicide Action. Chemistry and mode of action of herbicides. Nature of herbicidal action. Illustrates the various types of chemical weed control procedures in current use. The physiology of herbicidal action examined using the different mechanisms established for various chemical groups of herbicides. Prerequisite: 468, PLB 320.

520-3 Growth and Development of Plants. Physiological control of developmental processes. Emphasis on exogenous growth-regulating compounds and their behavior in plants. Prerequisite: PLB 320 or consent of instructor.

524-2 Advanced Plant Genetics. (See Plant Biology 524.) Prerequisite: BIOL 305 or equivalent.

526-4 Cytogenetics. (See Plant Biology 526.) Prerequisite: BIOL 306 and 306 or equivalent.

547-2 Soil-Plant Nutrient Relationships. A study of advanced topics relating to fertilizer and nutrient use efficiency by plants, including research methods for fertilizer use evaluation and plant response. Mechanisms in the soil for nutrient storage, release, fixation, and loss will be dealt with as they relate to efficient use by plants. Prerequisite: 447 or equivalent.

560-5 (3,2) Field Plot Technique. (a) Design of field plot and greenhouse experiments including appropriate statistical analyses for each of the designs. Data interpretation. Prerequisite: consent of instructor. **(b)** Each of the designs discussed in (a) will be illustrated with a type problem and solved by computer processes using primarily MINITAB and SAS software programs. Prerequisite: 560a or concurrent enrollment, or consent of instructor.

581-1 to 4 (1,1,1,1) Seminar. Individual presentations on subjects and problems relating to soils, field and horticultural crops, and other phases of plant and soil science. Graded *S/U* only.

582-6 (2,2,2) Colloquium in Plant and Soil Science. Recent developments and trends in specialized areas of plant and soil science will be discussed in **(a)** genetics and plant breeding, **(b)** research methods, **(c)** physiology and ecology.

588-1 to 8 International Graduate Studies. Residential graduate study programs abroad. Approval of department required both for the nature of program and number of hours of credit. Prerequisite: consent of department chair. Graded *S/U* only.

590-1 to 4 Readings. Contemporary books and periodicals on selected subjects within the fields of plant and soil science. Prerequisite: consent of department.

592-1 to 3 Special Problems. Directed study of specialized areas of crop production, horticulture, or soils depending on the program of the student. Discussion, seminars, readings, and instruction in research techniques. Prerequisite: consent of department.

593-1 to 4 Individual Research. Directed research on approved projects investigating selected fields of plant and soil science. Prerequisite: consent of department.

599-1 to 6 Thesis. At least three hours of thesis credit is required for the master's degree under the thesis option. Prerequisite: consent of department.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Plant Biology

For all field courses in plant biology, students will be assessed a transportation fee. In addition, certain courses may require the purchase of additional materials and supplies, generally $1 to $5 in total cost.

400-4 Plant Anatomy. An introduction to cell division, development, and maturation of the structures of the vascular plants. Laboratory. Prerequisite: 200 or consent of instructor.

404-4 The Algae. A phylogenetic approach to the study of algae with emphasis on comparative cytology, morphology, and ecology. Laboratories include a detailed survey of freshwater algae and a

general treatment of representative marine forms. Two lectures and two two-hour laboratories per week. Prerequisite: 204 or consent of instructor.

405-4 The Fungi. A survey of the fungi — their structure, development, relationships, ecological roles, and economic importance. Two lectures and two laboratories. Prerequisite: 204 or equivalent.

406-3 Bryology. Structure, development, and relationships of the liverworts, hornworts, and mosses. Two lectures and one laboratory per week. Prerequisite: 204 or equivalent.

409-3 Field Mycology. The taxonomy, ecology, and distribution of fungi in southern Illinois and environs with emphasis on techniques of specimen collection, preservation, identification, and recognition. Prerequisite: 200; 204 recommended.

410-3 Taxonomy and Ecology of Bryophytes and Lichens. Floristic studies of the moss, liverwort, hornwort, and lichen communities of southern Illinois. Prerequisite: 200 or equivalent, or consent of instructor.

411-3 Morphology of Ferns and Fern Allies. The study of external form, internal structure, and relationships of ferns and fern allies. Two lectures and one laboratory per week. Prerequisite: 204; 400 recommended.

412-3 Morphology of Gymnosperms. The study of external form, internal structure, and relationships of gymnosperms. Two lectures and one laboratory per week. Prerequisite: 204; 400 recommended.

413-3 Morphology of Angiosperms. The study of external form, internal structure, and relationships of the flowering plants. Two lectures and one laboratory per week. Prerequisite: 204; 400 recommended.

414-3 Paleobotany. (Same as Geology 414) The study of external form, internal structure, and relationships of plant fossils. Two lectures and one laboratory per week. Prerequisite: 204; 400 recommended.

421-4 Botanical Microtechnique. Introduction to practical methods of preservation and preparation of plant materials for laboratory and microscopic study. Paraffin and plastic embedding and sectioning techniques, and use of general and histochemical stains stressed. Includes chromosome squashing, whole-mount preparation, photomicrography, and other techniques. One lecture and three laboratories per week. Prerequisite: 200 or equivalent.

425-10 (5, 5) Advanced Plant Physiology. (a) Intermediary plant metabolism. Characterization of the photosynthetic and metabolic pathways of biosynthesis and degradation of organic constituents; role of environmental regulants of plant metabolism. **(b)** Physics of plants; membrane phenomena; water relations; mineral nutrition. Prerequisite: 320 and consent of instructor.

430-3 Economic Botany. Classification, evolution, domestication, and botanical characteristics of plants useful to people. Every year. Prerequisite: 200 or equivalent.

439-2 Natural Areas and Rare and Endangered Species. Evaluation of the natural area preservation concept with emphasis on how to detect natural areas and methods to preserve them. Emphasis on the rare and endangered species program, its significance, and its methodology. Prerequisite: 304, Biology 307.

440-3 Grassland Ecology. A study of grassland structure and function in relation to various biotic and abiotic factors. Cost of field trips ($5) and textbooks must be incurred by the student. Prerequisite: 304 and Biology 307 or equivalent.

443-4 Forest Ecology and Reclamation. Soil, climatic, and genetic factors affecting tree distribution and growth in disturbed and natural habitats. Saturday field trips. Prerequisite: 307 or equivalent.

444-4 Analysis and Classification of Vegetation. Includes concepts and analytical methods pertaining to plant community energetics, nutrient dynamics, succession, vegetation classification and niche theory. Laboratory will include the application of these concepts and methods to field situations. Cost of textbooks and travel fee ($15) must be incurred by the student. Prerequisite: Biology 307 or equivalent.

447-2 to 6 Field Studies in Latin America. Two to six weeks of intensive field work to acquaint students with the flora and vegetation in various environments of Latin America and with ecological and taxonomic field techniques. Cost varies with type of study and location. Transportation cost: $80. Prerequisite: advanced standing in one of the biological sciences and consent of instructor.

448-3 to 8 Field Studies in the Western United States. Three to six weeks of intensive field work designed to acquaint students with the flora, vegetation, and environments of the Rocky Mountains and adjacent areas. Both ecological and taxonomic field methods are emphasized. Transportation cost ($100), travel expenses, and textbooks must be incurred by the student. Prerequisite: 304, Biology 307 or equivalents, and consent of instructor.

449-4 Plant Systematics and Evolution. The principles of modern plant systematics including classification methods at different taxonomic levels, data analysis, speciation and isolating mechanisms, basic population genetics and the use of morphological, anatomical and molecular characters in assessing plant evolutionary relationships. Prerequisite: 304 or equivalent or consent of instructor.

450-2 Plant Geography. World distribution of plants related to environmental, floristic, and historical factors. Prerequisite: interest in biology.

451-4 Flora of Southern Illinois. Exposure to the major upland and lowland communities of southern Illinois with an emphasis on the identification, distribution and ecology of the natural and introduced floristic components. Prerequisite: 304 or consent of instructor.

456-2 Advanced Plant Pathology. A study of the changes occurring in host and pathogen at the host-parasite interface before, during, and after penetration. Control measures will be discussed and emphasis will be on midwest field crops. Two lectures per week. Prerequisite: 356 or consent of instructor.

457-2 Advanced Forest Pathology. A survey of recent literature on major forest diseases with emphasis on host-parasite interactions and disease control. Students will develop detailed literature reviews on selected pathology problems and

design experiments for solving these problems. Two lectures per week. Prerequisite: 357 or consent of instructor.

475-3 Advanced Cell Biology. (Same as Zoology 475.) Cell structure at molecular and cytological levels. Includes discussions of research methods, plasma membrane, cell exterior and recognition, the endomembrane system and related organelles, self-replicating organelles, the cytoskeleton, nuclear structure and function in cell replication, cell differentiation and response, and eukaryotic cell evolution. Prerequisite: BIOL 306 or equivalent.

476-2 Advanced Cell Biology Laboratory. (Same as Zoology 476.) Laboratory course to accompany Plant Biology 475. Light and electron microscopy, cell culturing, biochemical methods, and experimental protocols are used to study the structure of cell membranes, intracellular organelles, including the Golgi apparatus, ER, mitochondria, plastids, lysosomes, the cytoskeleton, and nucleus. Prerequisite: 475 or concurrent enrollment.

484-3 Palynology. (See Geology 484.)

485-2 Botanical Literature. A survey of the major classical and modern writings in the botanical sciences. This includes a consideration of the primary subdivisions; systematics, structure, physiology, genetics, and ecology. In addition, periodicals will be treated. Prerequisite: consent of instructor.

490-3 Photographic Methods in Scientific and Biological Photography. Black and white and color. Specimen photography, macrophotography. Slides for presentation, materials and methods used in scientific publications. Prerequisite: consent of instructor.

491-3 Scientific Illustration. Materials and methods used in illustrating scientific publications including two-dimensional graphs, maps, lettering, and line drawings. Three dimensional techniques will also be covered. Prerequisite: consent of instructor.

500-3 Advanced Plant Anatomy. The study of advanced topics in the anatomy of seed plants. Emphasis is on trends in and adaptive nature of evolutionary modifications of anatomical features and the application of anatomical data to plant systematics. Two lectures and one laboratory per week. Prerequisite: 400 and 421 or equivalent.

501-4 (2,2) Research Transmission Electron Microscopy. (Same as Science 501a,b.)

502-4 (2,2) Research Scanning Electron Microscopy. (Same as Science 502a,b.)

510-3 Techniques in Molecular Evolution and Systematics. Experience with current molecular techniques being employed to obtain data in systematic and evolutionary biology, specifically those dealing with macromolecules (isozymes and nucleic acids), plus exposure to phenetic and cladistic analysis of molecular data. Prerequisite: 449 or equivalent or consent of instructor.

524-2 Advanced Plant Genetics. A consideration of incompatibility systems, paramutation, cytoplasmic inheritance, developmental genetics, and other genetic topics as they occur in higher plants. Prerequisite: BIOL 305 or equivalent.

525-2 to 16 (2 to 4, 2 to 4, 2 to 4, 2 to 4) Cell Biology Research Techniques. A special techniques course designed for graduate students specializing in cell studies. Provides instrumentation training, with emphasis on application of the method to a research project. **(a)** Quantitative Cytology. **(b)** Immuno-Labelling and Qualitative Histochemistry. **(c)** Deep Etching Techniques in Electron Microscopy. **(d)** Cell Fractionation and Biochemical Techniques.

526-4 Cytogenetics. A study of structure, transmission, and mutation of nuclear and cytoplasmic genetic elements, with emphasis on the utilization of structural changes in chromosomes and of changes in chromosome number in theoretical and applied genetics. Two lectures and two laboratories per week. Prerequisite: BIOL 305 and 306, or equivalent.

532-3 Embryogenesis and Organography of Plants. A study of the developmental anatomy and comparative morphology of embryophytes, with emphasis on analysis of homologous versus analogous structure. In particular, the following aspects of organ development will be considered: embryological origin, cellular pattern of formation, cytochemical and histological characterization, and diversification in form. Laboratory will allow students to observe the organographic features discussed. Prerequisite: 320, 400, or consent of instructor.

533-3 Plant Growth and Morphogensis. A study of the role of the environmental variables (light, temperature, etc.) and phytohormones in the growth and morphogensis of intact plants and tissue cultures. The theories of plant organogensis and the synthesis, translocation, regulation, and mode of action of the major classes of phytohormones will be treated in light of the most recent literature. Three lectures per week. Prerequisite: 320 or consent of instructor.

534-2 Techniques in Studies of Plant Growth and Development. Instruction in laboratory techniques used in the study of the role of environment and natural plant growth substances in plant morphogensis. Two two-hour laboratories per week. Prerequisite: 320 or consent of instructor.

543-2 Tree Growth. Physiological aspects of tree growth and development. Phases of the life cycle from germination to seed production will be analyzed for effects of light, temperature, moisture, nutrients, mycorrhiza, wind, air pollution, and other factors. Two lectures per week. Prerequisite: 320 or 443 or FOR 331 or equivalent.

570-2 to 3 Graduate Readings in Plant Biology. A course of individually assigned readings in botanical literature. Every semester. Prerequisite: consent of instructor. Graded *S/U* only.

580-1 to 6 (1 per semester) Seminar. One hour discussion of current topics in biology. Every semester. Graded *S/U* only.

589-1 to 12 (1 per topic per semester) Seminars in Plant Biology. Studies of current and historical research and literature in various topic areas of plant biology: **(a)** ecology; **(b)** bryology; **(c)** paleobotany; **(d)** anatomy; **(e)** systematics; **(f)** phycology; **(g)** mycology; **(h)** pathology; **(i)** physiology; **(j)** morphology. Graded *S/U* only.

590-1 to 3 Introduction to Research. General introduction to research techniques. Techniques to be determined by instructor and students. Ev-

ery semester. Prerequisite: consent of instructor. Graded *S / U* only.

591-2 to 9 Research. Assignments involving research and individual problems. **(a)** anatomy; **(b)** bryology; **(c)** ecology; **(d)** morphology; **(e)** mycology; **(f)** paleobotany; **(g)** pathology; **(h)** photography; **(i)** phycology; **(j)** physiology; **(k)** systematics. Master's students may use this for their research for their thesis. Every semester. Prerequisite: consent of instructor. Graded *S / U* only.

599-2 to 9 Thesis. Course to be taken in the preparation of the master's thesis. Every semester. Prerequisite: consent of instructor. Graded *S / U* only.

600-1 to 36 (1 to 12 per semester) Dissertation. Course to be taken in the research for and in writing of the doctoral dissertation. Every semester. Prerequisite: consent of instructor. Graded *S / U* only.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S / U* or *DEF* only.

Political Science

The Department of Political Science offers courses toward the Master of Arts degree and Ph.D. degree in political science and the Master of Public Affairs.

403-4 Philosophy of Politics. (See Philosophy 441.)

404-3 History of Political Theory. Shall survey different theorists and perspectives which have contributed significantly to the development of the ongoing tradition of political theory up to modern times. Prerequisite: 303 or consent of instructor.

405-3 Democratic Theory. An examination of various species and aspects of democratic thought, including the liberal tradition and its impact upon the United States. Prerequisite: GEB 114 or consent of instructor.

406-3 Socialist Thought. An examination of socialist thought regarding social structure, economic institutions, and political power. Prerequisite: senior or graduate standing or consent of instructor.

408-3 Contemporary Political Theory. Shall explore the theorists and perspectives which have contributed to contemporary views of the political world. Prerequisite: 303 or consent of instructor.

413-3 Contemporary Intergovernmental Relations. An examination of relationships among national, state, and local governments in the American federal system, with emphasis on recent literature and contemporary issues. Special attention is given to fiscal relations, and specific intergovernmental programs in areas such as housing and environmental quality are examined. Prerequisite: GEB 114.

414-3 Political Systems of the American States. The state level of government viewed with emphasis upon recent developments and current research. Prerequisite: 213.

415-3 Urban Politics. An examination of the environment, institutions, processes, and functions of government in an urban society with particular emphasis on current problems of social control and the provision of services in the cities of the U.S. Prerequisite: 213.

417-3 Political Psychology. An examination of various psychological theories as they relate to the development and change of political attitudes, leadership behavior, and mass political participation. Prerequisite: 200 recommended.

418-3 Political Communications. (See Speech Communication 451.)

419-4 Political Sociology. (See Sociology 475.)

420-3 Interest Group Politics. An examination of the structure, mobilization and impact of interest groups on American political life. The course objectives are to study various normative critiques of American pluralism and examine the political influence of contemporary interest groups, such as labor, racial and women's organizations. Prerequisite: GEB 114.

429-3 Women and the American Political Process. (Same as Women's Studies 445.) Focuses on the role of women in the American political system. Examines the political behavior of women as voters and as political elites. Also analyzes policies regarding women's issues, such as comparable worth, affirmative action, and reproductive rights.

433-6 (3, 3) Constitutional Law. (a) This, the initial course in a two-course sequence, is concerned with the basic structure and power relationships in the American constitutional system. Topics include judicial review, judicial restraint, separation of powers, the federal system, national powers, state powers, the contract clause, and substantive due process. Prerequisite: GEB 114. Political Science 330 recommended. **(b)** This, the second course in the constitutional law sequence concentrates on those provisions of the U.S. Constitution which protect individual rights and liberties against government encroachment. Prerequisite: GEB 114.

435-3 Judicial Process and Behavior. An examination of the process by which judges in both trial and appellate courts at federal and state levels are selected and of the ways in which they make decisions. Attention to the structure of the courts. Study of the communication and impact of judicial decisions. The course will provide some insight into the methods used to study judicial behavior.

436-3 Administrative Law. The procedural law of public agencies, particularly the regulatory commissions but also executive branch agencies exercising regulatory functions. The exercise of discretion and its control through internal mechanisms and judicial review. Prerequisite: 340 or GEB 114 recommended.

437-3 Jurisprudence (Theories of Law). Major schools in legal thinking. Positive law and natural law. Idea of justice and concept of natural rights.

441-3 Administration of Bureaucratic Organizations. A study of the elements of bureau-

cratic organization and of problems and procedures in administration of complex public agencies. Emphasis is placed on the personnel aspects of public bureaucracy, including the history and structure of civil service systems, conditions of public service employment, and issues in leadership and supervision. Prerequisite: 340 or consent of instructor.

443-3 Public Financial Administration. An examination of governmental revenues and expenditures, with emphasis on state and local governments. Special attention is given to patterns of taxation and expenditure, intergovernmental fiscal relations, municipal debt, and administrative decisionmaking. Prerequisite: 213 recommended.

444-3 Policy Analysis. An examination of basic concepts in the policy sciences, approaches to policy analysis, applications to selected areas of policy, and instruments of policy development.

445-4 Administration of Environmental Quality and Natural Resources. (Same as Geography 426.) An examination of institutional arrangement and administrative practices in the protection and use of land, water, air, and mineral resources. The course include analysis of responsibility and decision-making at all levels of government (federal, state, and local) as well as corporate, interest group, and individual responses to public programs. Particular attention will be given to administration of federal environmental quality legislation including the National Environmental Policy Act, the Clean Air Act, the Water Pollution Control Act, and the Surface Mining Reclamation Act.

446-3 Museum Administration. A comprehensive introduction to museum administration and management, including fiscal and budget oversight; an understanding of museum ethics; acquisition, conservation, and exhibition planning; personnel matters; and museum research. Museum practicum and research stressed.

447-4 to 5 (3, 1 or 2) Urban Planning. (See Geography 470a,b.)

452-3 The Politics of Developing Areas. A comparative study of the principal features of traditional, transitional, and modern political systems, patterns of political socialization and culture as well as leadership recruitment and client-patron relationships in traditional and transitional political systems; the nature of political participation in predominately agrarian societies, and the strategies utilized to rule and to legitimize the rule of predominately post-colonial societies. Prerequisite: none. GEB 250 recommended.

455-3 Comparative Public Administration. Administrative attitudes, behaviors, and institutions are compared on a topical basis in governments of Britain, Europe, the United States, Japan, and selected socialist, developing, and ancient states.

456-3 Comparative Social Policy. Issues of the modern welfare state in comparative perspective. Factors affecting the extent and nature of the welfare state in the United States. The problem of what types of policies would be most effective in achieving alternative types of welfare results. Emphasis on comparative analysis and interrelationships within larger social systems.

457-3 Great Britain and the Commonwealth. The nature of the Commonwealth Association and the politics of Great Britain and the "Old Commonwealth" countries: Australia, Canada, New Zealand. Prerequisite: none. GEB 250 recommended.

458-3 Contemporary Western Europe. Comparative study of contemporary political systems and policy issues of Western Europe. Emphasis on selected countries and common problems facing governments. Topics covered include the European community, security, economic, energy, and social policies, and study of various governing processes.

459-3 Government and Politics of the Soviet Union. Dynamics of Soviet government and economy. Prerequisite: none. GEB 250 recommended.

461-3 Governments and Politics of Southeast Asia. Politics and governments of Burma, Thailand, Malaysia, Vietnam, Cambodia, Laos, Singapore, Indonesia, and the Philippines. Prerequisite: none. GEB 250 recommended.

462-3 Governments and Politics of Vietnam. Origins of revolution. The war for national reunification. Impact of American involvement. Contemporary problems of consolidation and development under communist rule. Implications for regional security. Prerequisite: GEB 250 recommended.

463-3 Government and Politics of China. Internal political, economic, and social development of China. Prerequisite: none. GEB 250 recommended.

464-3 Governments and Politics in the Middle East. Internal and international politics of the Islamic states of the Middle East and North Africa and Israel. Prerequisite: none. GEB 250 recommended.

465-3 Governments and Politics of Sub-Saharan Africa. (Same as Black American Studies 465.) An examination of the impact of western colonial rule on the societies and politics of Africa, the methods by which these colonial areas became sovereign states in the post-World War II era, the role of domestic political institutions, African political thought and behavior, and the development of foreign policies regarding relations with other African states, continental and international organizations, and non-African states. Prerequisite: none. GEB 250 recommended.

466-3 Government and Politics of Latin America. An in-depth analysis of specific problem areas in Latin American political processes as well as comparative study of selected Latin American nation-states. Prerequisite: none. 366 recommended.

468-3 Comparative Civil-Military Politics. A comparative study of the growth of the relationship of the armed forces with the civilian sector of the body politic, the selection, training, and professionalization of the officer corps, the control of the armed forces by the executive and legislature, the growth of strategic doctrine, insurgency and counter-insurgency warfare, and the analysis of the role of the armed forces as a governing group in a large number of nonwestern states. Prerequisite: none. GEB 250 recommended.

475-6 (3, 3) International Law. **(a)** Rules and practices governing the nations in their relations

in peace and war. Prerequisite: none. 270 recommended. **(b)** Investigation of special problems in international law. Prerequisite: 475a.

477-3 The Making of American Foreign Policy. An advanced course dealing with the formulation and administration of American foreign policy. Prerequisite: none. 378 recommended.

480-3 International Politics. Definition and analysis of the concepts of spheres of hegemony, alliances, regionalism, integration, interdependence, and an evaluation of their application to contemporary international politics. The course will stress the need for the continuing evaluation of the vague role of national power and influence within the framework of a changing world environment.

485-3 International Relations of the Far East. The political and strategic problems and the interplay of the foreign policies of the major powers in this area. Prerequisite: none. 270 recommended or History 380 recommended.

488-3 International Relations of the Western Hemisphere. Emphasis on the international behavior of Latin American nation-states and/or regions especially related to policy trends and historical and contemporary objectives of the U.S. Prerequisite: none. 270 recommended.

500-3 Pro-Seminar in Research Methods. A survey at the graduate level of major topics in empirical research methods. Subject matter will include the philosophy of science, measurement problems, methods of data acquisition, strategies of research design, levels of analysis, modes of analysis, and research ethics. The student is strongly urged to enroll in this course prior to enrolling in 502. Students offering methods as an area of concentration are required to complete this course prior to enrolling in 501 and 502. Required of all M.A. students to fulfill methods requirement for degree.

501-3 to 9 (3 per topic) Research Methods. **(a)** Experimental and quasi-experimental research design. The role of experimental and quasi-experimental research design in political science. Specific topics discussed include the logic of experimental control, principles of research design, threats to internal and external validity, and ethical considerations in experimenting with human beings. Prerequisite: EPSY 506 and 507. **(b)** Simulation. Analysis, design, construction, and evaluation of human, human-computer, and computer games and simulations for teaching, training, and research in political science. Prerequisite: EPSY 506 and 507. **(c)** Survey research and sampling. Basic concepts of sampling, sampling frames; types of sample design; survey designs, questionnaire construction, interviewing, coding, introductory survey analysis techniques, and ethical considerations in political science. Prerequisite: EPSY 506 and 507. **(d)** Causal modeling. Statistical techniques for the non-experimental investigation of causal systems. Logic of causal analysis, systems of simultaneous linear equations, causal modeling, path analysis, and structural equation models. Prerequisite: EPSY 506 and 507. **(e)** Theory and Methods of Scaling. (See Psychology 527.) **(f)** Theory building. Techniques of theory-building and typology construction. Probability theory; game theory; systems of differential equations; difference equation models; time series models; computer simulation models, and causal models. Criteria for evaluating internal and external validity for the best theory. Prerequisite: EPSY 506 and 507.

502-3 to 6 Topical Seminar in Research Methods. Advanced seminar in empirical research methods. Topics will vary with instructor. Prerequisite: consent of instructor.

503A-3 Data Preparation and Management-Mainframe. Covers the mainframe computer creation, dictionarying, cleaning, and management of data files using SAS, SPSSX, BMD, OSIRIS, and the IBM OS/VS utility programs. Also treats the use of the IBM Job Control Language (JCL), the Conversational Monitor System (CMS), catalogued procedures, instream procs, and CMS EXEC's. A research tool course not to be counted toward graduate degree requirements.

503B-3 Data Preparation and Management-Microcomputer. Covers the micro computer creation, dictionarying, and cleaning and management of data files using SPSSPC, SASPC, or other micro packages. Also treats Disk Operating Language and procedures for moving data between micro and main frame computers. A research tool course not to be counted toward graduate degree requirements.

504-3 Pro-Seminar in Political theory. The course will survey a sampling of the best works from the broad and diverse spectrum of political theory. Normative, empirical, analytical, critical, and other types of theoretical works will be analyzed. Students offering political theory as a graduate area are required to complete this course prior to enrolling in research seminars in political theory.

505-3 to 6 (3,3) Topical Seminar in Normative Theory. Topic will vary with instructor. Student should see director of graduate studies for advanced syllabus.

508-3 to 6 (3,3) Topical Seminar in Empirical Theory. Systems, structural-functional, conflict, decision-making, integration, organization, exchange, communications, democratic, totalitarian, change and revolution theories will be analyzed to determine their domain and predictive and/or explanatory capacities. Generally, half of these theories will be offered every other year. Prerequisite: consent of instructor.

510-3 Pro-Seminar in American Politics. Designed to survey the major literature in the field of American government at the graduate level. The course will synthesize and integrate the literature and give an overview of topics that will be covered in greater depth in each subject-matter research seminar. Highly recommended for new teaching assistants. Required for students offering American politics as a graduate area before enrolling in more advanced subject-matter seminars.

511-3 to 6 (3,3) Topical Seminar in American Politics. Topic will vary with instructor. Student should see director of graduate studies for advanced syllabus. Prerequisite: basic course, related training, or consent of instructor.

514-3 Seminar in American State Politics. Student should see director of graduate studies of advance syllabus. Prerequisite: 414 or consent of instructor.

515-3 Seminar in Urban Politics. Student should see director of graduate studies for advance syllabus. Prerequisite: 415 or consent of instructor.

516-3 to 6 (3,3) Seminar in Political Behavior. Topic will vary with instructor. Student should see director of graduate studies for advance syllabus. Prerequisite: basic courses, related training, or consent of instructor.

518-3 Seminar in Political Parties. Student should see director of graduate studies for advance syllabus. Prerequisite: basic courses, related training, or consent of instructor.

521-3 Seminar in the Legislative Process. Student should see director of graduate studies for advance syllabus. Prerequisite: basic courses, related training, or consent of instructor.

530-3 Pro-Seminar in Public Law. Designed to survey the major literature in the field of public law at the graduate level. The course will consider both traditional and nontraditional approaches to the subject and will acquaint students with readings and analyses covering the scope of this subfield. Required of all students offering public law as a graduate area. Prerequisite: basic undergraduate work in the field or consent of instructor.

538-3 Seminar in the Judicial Process. An examination of the literature on such topics as judicial selection, the impact of court decisions, court procedure, and the factors affecting the decision-making behavior of judges. Prerequisite: 433 or equivalent or consent of instructor.

540-3 Environment of Public Administration. Examination of the social, political, legal, and managerial constraints on the behavior of public administrators. Special attention is given to the relationship between public sector managers, on the one hand, and legislators, interest group representatives, elected executives, agency employees, clients, and the general public, on the the other hand. Issues in ethics and the public's expectations of professional administrators are also examined. Prerequisite: GEB 212 and POLS 340 or equivalent or consent of instructor.

541-3 Seminar in Applied Problems of Public Administration. Study of selected problems in public administration and policy. Emphasis placed on the practitioner's perspective. Prerequisite: 340 or consent of instructor.

542-3 Public Budgeting and Fiscal Management. An examination of the theory and practice of budgeting in the public sector and of selected elements of fiscal management. The course focuses on administrative aspects of budgeting and is oriented toward preparation of students for careers in the public service. Approaches and techniques in revenue forecasting, program planning, and performance measurement are included. Students utilize primary materials in conducting individual or class projects aimed at development of budgetary skills. Prerequisite: 340 or equivalent or consent of instructor.

543-3 Public Personnel Management. A study of the processes and procedures used in contemporary public personnel systems. Emphasis is placed on examination of competing models of personnel administration, application of personnel management strategies to specific case problems, and public sector labor relations. Required of all M.P.A. degree candidates. Prerequisite: consent of instructor.

544-3 Program Analysis and Evaluation. An examination of approaches and problems in the analysis and evaluation of governmental programs. Emphasis is placed upon the use of analytical techniques to determine program impact and the use of evaluation in governmental decision making. Required of all M.P.A. degree candidates. Prerequisite: graduate level statistics course or consent of instructor.

545-3 Organization Theory and Behavior. An examination of various approaches to describing and understanding public organizations and the individuals within them. Emphasis is placed on study of the important theoretical literature in the field and on the application of theory of practical management problems in governmental units and agencies. Required of all M.P.A. students. Prerequisite: consent of instructor.

547-6 (3,3) Topical Seminar in Public Administration. (a) Devoted to selected techniques and tools of public administration; **(b)** in-depth study of selected problems in the process and environment of public administration.

549-3 Administration of Nonprofit Organizations. Examines the characteristics of nonprofit organizations that distinguish them from the public and for-profit sectors. Explores social and economic functions of nonprofits and such administrative issues as fund raising, working with volunteers and governing boards, satisfying tax codes, and service distribution. Prerequisite: 340 or equivalent or consent of instructor.

550-3 Pro-Seminar in Public Administration. A survey of the major literature in the field of public administration. The course will synthesize and integrate the literature and provide an overview of topics to be covered in greater detail in other seminars. Required of M.A. and Ph.D. students offering public administration as a graduate area before enrolling in more advanced subject-matter seminars.

551-3 Aviation Policy and Planning. This course presents an examination of civil and military aviation policy and planning at the federal, state, and local levels. The course will focus primarily on federal aviation policy and planning with emphasis on the substance of key aviation policies, the policy making process and the various agencies and client groups which influence these policies. The annual aviation forecast of the Federal Aviation Administration, and related policies and plans will be reviewed. Each student will prepare an aviation public policy issue paper. Prerequisite: MPAA students or consent of instructor.

552-3 Advanced Airport Administration. This course will address the role and function of the airport administrator, especially related to the tasks of developing, operating and maintaining various airport services to meet the needs of key airport users. This course will study key airport administration cases at primary, commercial service, reliever and general aviation airports. Meeting key airport regulations concerning operations and security will be a focus of the course. Prerequisite: MPAA students or consent of instructor.

553-3 Advanced Aviation Safety Administration. The Aviation Safety Administrator's job function and responsibility for safety and accident prevention within an aviation organization is examined using the case study method. The relevant theory, concepts, procedures, and techniques of resource allocation, organizational design, decision modeling, task assignment, delegation of authority and responsibility, establishment of organizational goals and priorities, and risk management as they relate to Aviation Safety are included. The job functions of an Aircraft Accident Investigation Team and of an Aviation Safety Inspector will be studied. Aviation safety administration literature will be reviewed. Prerequisite: MPAA students or consent of instructor.

554-3 Aviation Law and Regulation. An examination of both international and domestic laws, treaties and regulations. Students study the rule-making process as it applies to aviation, the regulators, the laws and regulations, and effects on the regulated. Special emphasis is given to the administration and enforcement of aviation regulations. Prerequisite: MPAA students or consent of instructor.

556-3 Seminar in Municipal Administration. A study of the literature and recent developments in municipal administration. Emphasis is on literature and developments in areas of longstanding interest—including organization and management, state-local relations, and finance and capital improvement. Prerequisite: completion of at least four of the MPA core courses, or consent of the instructor.

560-3 Pro-Seminar in Comparative Politics. A survey of the major literature in the field at the graduate level. The course will synthesize and integrate the literature and give an overview of topics that may be covered in greater substantive depth in each subject matter seminar in comparative politics. Students offering comparative politics as a graduate area are required to complete this course prior to enrolling in research seminars in comparative politics.

568-3 Seminar in Comparative Analysis. Development and evaluation of appropriate approaches, theories, research designs, and data gathering and analysis techniques for studying a variety of macro and micro level, cross-cultural and cross-level comparative research problems.

569-3 to 6 (3,3) Topical Seminar in Comparative Politics. Topic will vary with instructor. Student should see director of graduate studies for advance syllabus. Prerequisite: basic courses, related training, and consent of instructor.

570-3 Pro-Seminar in International Relations. A survey of the major literature in the field at the graduate level. The course will synthesize and integrate the literature and give an overview of topics that may be covered in greater substantive depth in subject matter seminars in international relations. Students offering international relations as a graduate area are required to complete this course prior to enrolling in research seminars in international relations.

573-3 Seminar in International Organization. Student should see director of graduate studies for advance syllabus.

575-3 Seminar in International Law. Student should see director of graduate studies for advance syllabus.

577-3 to 6 (3,3) Topical Seminar in Foreign Policy. Topic will vary with instructor. Student should see director of graduate studies for advance syllabus. Prerequisite: basic courses, related training, or consent of instructor.

580-3 to 6 (3,3) Topical Seminar in International Relations. Topic will vary with instructor. Student should see director of graduate studies for advance syllabus. Prerequisite: basic courses, related training, or consent of instructor.

590-1 to 6 Readings. Supervised readings in selected subjects. Prerequisite: completion of the appropriate pro-seminar for the field in which readings or individual research is to be done.

591-1 to 6 Individual Research. Selection, investigation, and writing of a research paper under the personal supervision of a member of the department graduate staff. Prerequisite: completion of the appropriate pro-seminar for the field in which readings or individual research is to be done.

593-1 Preprofessional Seminar in Political Science. Designed to give the student an introduction to the major professional roles in the discipline. The requirements of teaching, research, publication, and service are covered with discussion of where each fits into the professional role requirements and examples of how each is accomplished. Required of all Ph.D. and M.A. students in political science and other teaching assistants in political science. Graded *S/U* only.

595-1 to 6 Internship in Public Affairs. Fieldwork in the office of a governmental or quasi-governmental agency. The internship is arranged by the field coordinator of the M.P.A. degree program and provides a stipend as negotiated by the coordinator and agency representative. A paper in which the student correlates academic knowledge with practical internship experience is required. Mid-career M.P.A. students may receive credit upon completion of a paper relating previous work experience to public administration literature and theory. Prerequisite: consent of department. Graded *S/U* only.

596-1 to 6 Research Paper in Public Affairs. Upon successful completion of core courses, the student expands and develops a previously written MPA graduate program paper. The project involves an issue or problem in public administration and is written with the approval and under the supervision of the student's committee chair. Graded *S/U* required. Prerequisite: consent of department.

599-1 to 6 Thesis. Maximum of six hours to be counted toward a degree. Prerequisite: consent of instructor.

600-1 to 36 (1 to 12 per semester) Dissertation. Minimum of 24 hours to be earned for the Doctor of Philosophy degree.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concur-

rent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Public Affairs

(See Political Science.)

Psychology

407-3 Theoretical Issues in Learning. An introduction to the major theoretical issues in learning and their importance. A brief review of the history of such problems will be followed by a summary of the current research concerning these issues. Traditional figures in learning theory will be considered within the context of their positions on specific questions. Prerequisite: 309 or equivalent.

409-3 History and Systems of Psychology. A review of the conceptual and empirical antecedents of modern psychology. Prerequisite: senior status.

411-3 Principles of Training. An in-depth coverage of practical problems concerned with training to which the principles of learning derived from pure laboratory investigations can be applied. Prerequisite: 309.

413-3 Individual Differences. Reviews the reliable and theoretically significant individual and group differences that have been revealed by research in the behavioral sciences. Examines differences in general intelligence, specific verbal and spatial abilities, stylistic and personality characteristics, as well as such group differences as sex, race, and socioeconomic status. Prerequisite: 305.

414-3 Biology of Behavior Disorders. An examination of theory and research pertaining to the physiological basis of therapies for a variety of psychological problems such as affective disorders, schizophrenia, alcohol and drug abuse, organic brain dysfunction, and aging. Prerequisite: 302.

415-4 Psychopharmacology. A survey of the effects of drugs on the normal and abnormal behavior of humans and animals. A primary focus is upon understanding drug influences on behavior in relation to actions on the nervous and endocrine systems. Prerequisite: 302 and GEB 202.

416-3 Recovery of Function Following Brain Damage. A survey of experimental animal and human clinical research as they relate to behavioral recovery following damage in the central nervous system. Recent theories and literature are stressed. Prerequisite: 302 or consent of instructor.

419-3 Behavior and Heredity. Provides an overview of the experimental and quantitative methods used in studying behavioral differences associated with genetic variables. Elementary aspects of genetics will be included in the course, which will examine several aspects of both human and nonhuman behavior. Prerequisite: 211 or consent of instructor. Zoology 214, Biology 305, or equivalent recommended.

421-3 Psychological Tests and Measurements. Introduction to test theory and test development. Detailed coverage of selected tests from such areas as intelligence, aptitude, and personality. Prerequisite: six hours of psychology.

431-3 Psychopathology. Classification, description, etiology, and treatment of the disorders of personality organization and behavioral integration. Observations in a state mental hospital setting. Prerequisite: 305 or consent of instructor.

432-3 Psychopathology of Childhood. An extensive review and systematic evaluation of theories and research pertaining to the behavior disorders of childhood. Emphasis will be upon empirical data and the implications of these data for the classification and treatment of these disorders. Prerequisite: 211 and 301 or EPSY 422.

440-3 Theories of Personality. A review and evaluation of major personality theories and their supporting evidence. Prerequisite: 305 or consent of instructor.

441-3 Helping Skills in Clinical and Counseling Psychology. Provides systematic training in helping skills for students considering clinical or counseling psychology as a career. Students learn to identify and demonstrate such individual skills as encouragement, paraphrasing, and reflection of feeling, and will use them in practice situations. Students will also learn to apply various approaches to psychotherapy and counseling using hypothetical case studies. The course is complementary to 340. Prerequisite: 340 or consent of instructor.

445-4 Introduction to Psycholinguistics. (See Linguistics 445.)

451-3 Advanced Child Psychology. An assessment of concepts, methods, and research techniques within selected topic areas of developmental psychology. Prerequisite: 211 and 301, or consent of instructor.

463-3 Attitudes and Persuasion. An examination of theory and research regarding the formation of attitudes, the modification of attitudes, and the techniques for measuring attitudes. Prerequisite: 307.

465-3 Need Assessment Techniques for Mental Health Planning. Surveys methodological techniques for assessing the need for mental health services including developing a resource inventory, use of census and other social indicator data, rates under treatments, community and consumer surveys, hearing and site visits. Attention is also paid to method of presenting results of need assessments to lay boards. Prerequisite: senior standing in psychology major, or graduate status, or consent of instructor.

489-1 to 12 Seminar: Selected Topics. Varied content. Offered as need exists and as faculty interests and time permit. Prerequisite: consent of instructor.

510-3 Learning Processes. Reviews current literature in various areas of learning. Coverage is limited to those topics which are subject to laboratory investigation and which do not involve verbal processes.

511-3 Human Learning and Memory. Survey of the current experimental theoretical literature on human learning and memory with primary

emphasis on verbal learning and memory. Prerequisite: consent of instructor.

512-4 Sensory Processes. A study of the structure and functions of the sense organs. Emphasizes the psychological data which describe the function of these organs. Lecture and laboratory. Prerequisite: consent of instructor.

513-3 Human Psychophysiology. Physiology, instrumentation, and methodology of psychophysiological measurements including both autonomic and central nervous systems. Attention will be given to basic and applied research. Prerequisite: graduate standing.

514-4 Neurobiological Bases of Behavior. An advanced study of neuroanatomical and neurophysiological principles underlying behavior. Topics covered include structure and function of neurons, synaptic transmission, sensory processing, motor control, development and plasticity of the nervous system, and other current topics in neurobiology. Prerequisite: 302 or equivalent and consent of instructor.

515-3 Theory and Research in Cognitive Psychology. A detailed survey of current studies of attention, short-term memory, and thought processes. Prerequisite: consent of instructor.

516-3 Human Clinical Neuroanatomy. Basic functioning of the nervous system, detailed gross anatomy and dissection of the human brain, functional disorders following brain damage, noninvasive cranial nerve examination. Prerequisite: graduate standing.

517-3 Aging, Memory and Cognition. A detailed survey of current methodology, research and theory dealing with cognitive and memory processes in later adulthood. Topics covered include attention, memory, reasoning and problem solving, language processing and inference, and age-associated pathologies affecting cognition and memory. Prerequisite: consent of instructor.

520-3 Applications of the Psychology of Learning and Memory. A survey of the theories and methods of training that have resulted from research in the areas of learning and memory. Students will review some of the very recent methods as well as those that are better developed. Practice will be provided. Prerequisite: 309 or consent of instructor.

522-8 (4,4) Experimental Design and Analysis. A relatively detailed treatment of the rationale for quantitative methods in psychological research: **(a)** experimental design and the analysis of variance; **(b)** complex designs and extensions of the analysis of variance. Prerequisite: psychology graduate student or consent of instructor.

523-3 Research Methods in Clinical Psychology. A discussion of the problems of experimental design, control, and analysis that are encountered by researchers in clinical psychology. This course emphasizes the application of techniques learned in other courses to the problems of critically evaluating published articles, generating research ideas, and evaluating internal and external validity of experimental designs. Prerequisite: psychology department required statistical sequence.

524-3 Multivariate Methods of Psychology. Detailed treatment of multiple-factor analysis and multiple regression analysis. Also includes introduction to other multivariate methods such as discriminant analysis and cluster analysis. Prerequisite: 522b or consent of instructor.

525-3 Mental Test Theory. Intensive coverage of such topics in test theory as item analysis, reliability, validity, problems of weighting in differential prediction, and problems in selection and classification. Prerequisite: 421 or consent of instructor.

526-3 Research in Counseling Psychology. This course provides a basic foundation of research skills. The course includes extensive reading in counseling psychology research and coverage of research design, specific research techniques, technical writing, and research ethics.

527-3 Theory and Methods of Scaling. The theory of measurement, by which observed behavioral events can be translated into quantitative scales of psychological constructs. The course will cover several axiom systems that form the foundation for psychological measurement, including representation in more than one dimension. Prerequisite: 522b.

528-3 Decision Analysis: Techniques for Aiding Decisions. A survey of formal methods for making decisions, based on subjective probability and multiattribute utility assessments. Students will be given practice in using methods of decision analysis for solving decision problems. Prerequisite: 522a or consent of instructor.

530-4 (2,2) Systems of Personality and Psychotherapy. A survey of the major theories of personality and systems of psychotherapy. Stresses relationship between theory and application. Prerequisite: consent of instructor.

531-3 to 6 Community and Institutional Field Placement. Introduction to a variety of area agencies with each student affiliating with two agencies at least two days per week. Individual and group supervision with special attention to the variety of clinically related problems and approaches to treatment encountered in the course of their activities. Required for clinical students. Prerequisite: 530b, psychology graduate in clinical or counseling.

532-2 Experimental Approaches to Personality. Presentation of conceptual formulations and research data from representative experimental approaches to personality. Students will be expected to carry out a research project during the course. Prerequisite: 530a or consent of instructor.

533-2 Experimental Approaches to Psychopathology. An examination of the research literature on several issues in clinical psychopathology. Prerequisite: psychology graduate or consent of instructor.

534-3 Principles of Behavior Therapy. (Same as Rehabilitation 554.) A presentation of the clinical techniques and research findings associated with the various behavior therapies (including desensitization, assertive training, modeling, operant techniques, aversive conditioning, "cognitive" behavior therapy). Prerequisite: graduate standing in the psychology department (clinical/counseling) or consent of instructor.

535-3 Psychopathology. Surveys the following issues and content areas in psychopathology: models and definitions of psychopathology, anxiety states, depression, schizophrenia, neurosis, behavior genetics, the mental hospital, and the

classification of psychopathology. This course required for all clinical students within their first two years. Prerequisite: psychology graduate student or consent of instructor.

536-4 Fundamentals of Counseling. An introduction to counseling psychology as a professional specialty. Professional and ethical issues in the training and work of counseling psychologists are examined. Basic counseling skills are acquired through practice interviewing. Prerequisite: psychology graduate student or consent of instructor.

538-3 Theory and Practice of Group Facilitation. Didactic presentation of group dynamics and group counseling/therapy. Theories coordinated with facilitation of Psychology 101 groups. Prerequisite: graduate status.

539-3 Experimental Approaches to Psychotherapy. A review and evaluation of empirical research related to the amelioration of maladjustment. Emphasis is on measurement and methodological problems. Prerequisite: 530 or consent of instructor.

540-6(3,3) Psychological Assessment. Basic theory, practice, underlying assumptions, and research data on psychological assessment. **(a)** Objective psychological assessment. Methods include intelligence testing, objective personality scales, interviews, and observations. **(b)** Projective psychological assessment. Methods include the Rorschach Inkblot technique and Thematic Apperception Test. Prerequisite: psychology graduate status.

542-3 Principles and Problems in Personality Assessment. Critical review of research related to such topics as scale construction strategies, response styles, trait attribution, judgmental accuracy, and judgmental processes. Prerequisite: consent of instructor.

543-3 Advanced Child Assessment. Basic theory, research, and practice in the psychological assessment of children's learning and emotional problems. Prerequisite: 540a, consent of instructor and psychology graduate standing.

544-3 Advanced Adult Assessment. Practical experience at conceptualizing psychopathology from a standard clinical test battery and in writing clinically meaningful test reports. Prerequisite: 540a, 540b, consent of instructor, and psychology graduate standing.

545-3 Introduction to Neuropsychological Assessment. Overview of the development of neuropsychology from signs to test batteries and methodology. Prerequisite: 540a, consent of instructor, and psychology graduate status.

546-3 Human Clinical Neuropsychology. This course will familiarize students with the basic concepts, empirical foundations, and clinical applications of human clinical neuropsychology. The neurobehavioral manifestations of both acute and chronic conditions will be covered. Prerequisite: 540a, psychology graduate status, and consent of instructor.

547-3 Fundamentals of Psychological Measurement. Examination of the fundamental principles and concepts of psychological mearsurement, including theories of personality and ability structure, test construction and standardization procedures, and conceptions of reliability and validity. Prerequisite: 421 or consent of instructor.

548-3 Vocational Psychology and Career Development. Introduces students to vocational psychology as an area of academic inquiry. The topics covered include theories of career development, occupational information, computer applications, research issues, and vocational counseling techniques. Prerequisite: 547 or consent of instructor.

549-3 Behavioral Assessment. A didactic and practicum course concerned with principles and methods of behavioral assessment including behavioral interviewing, questionnaires, self-monitoring, naturalistic and structured observation, and psychophysiological assessment.

551-3 Advanced Developmental Psychology I. Studies current research trends in experimental child psychology: an introduction to methods and theory, the biological bases of development, infancy, cognition, perceptual development, and language. Prerequisite: consent of instructor.

552-3 Advanced Developmental Psychology II. Consideration of current methods, research, and theory in developmental psychology with particular attention to social and personality development, and parent-child relations. Prerequisite: consent of instructor.

553-3 Cross-Cultural Psychology. Examines different topics in areas such as psychopathology, social and developmental psychology from a cross-cultural perspective. Prerequisite: consent of instructor.

554-3 Developmental Theories. An analysis of contemporary theories of development and related research as they are derived from major historical theories of development. Prerequisite: 551 and consent of instructor.

555-3 Language and Cognition. Current theoretical problems in language and cognitive developments are investigated from the perspective of psychology, physiology, linguistics, and computer simulations. Prerequisite: consent of instructor.

556-3 Child Psychotherapy. Survey and analysis of traditional and contemporary approaches to individual child psychotherapy. Includes psychodynamic, humanistic-nondirective, hypnotherapy-imagery, and other perspectives as well as therapy outcome research. Prerequisite: consent of instructor and psychology graduate status.

557-3 Family Psychotherapy. Investigation of the psychosocial interior of the family. Evolution and dynamics of interaction in families. Study of the methods of therapeutic intervention with families. Prerequisite: consent of instructor and psychology graduate status.

558-3 Personality and Social Development of Adults. A lecture-discussion course which presents the major theoretical and empirical literature in the area of adult personality and social development. Students are encouraged to apply normal developmental constructs to understand individual adults, as well as to gain competence in research methods in this area. Prerequisite: psychology graduate student or consent of instructor.

559-3 Behavioral Child Therapy. Survey and analysis of behavioral and cognitive-behavioral approaches to the treatment of child psychopathology. Prerequisite: consent of instructor and psychology graduate status.

564-3 Program Evaluation: Experimental and Quasi-Experimental Approaches. Re-

view of experimental and quasi-experimental designs for assessment of program impact. Discussion of design, logistic, and political implementation problems. Detailed examination of a number of attempts at program evaluation. Prerequisite: 500-level statistics course.

567-3 Stress, Coping and Social Support. Overview of theory and research on stress, coping, and social support. Emphasis is on psychosocial approaches to the stress process including life events, hassles, work stress, and family stress. Social support also is examined, both as a moderator of stress effects and as a valuable resource in its own right.

568-3 Community Psychology. Comprehensive overview of community theory, research, and action. Topics covered include: (1) paradigmatic assumptions of the community approach to psychosocial problems, (2) basic concepts, models and issues including prevention, paraprofessionals, systems theory, and social context, (3) social intervention strategies, and (4) examination of selected contemporary psychosocial problems. Prerequisite: psychology graduate status or consent of instructor.

569-1 to 3 Applied Research Consultants. Consulting firm which provides applied research experiences for advanced graduate students on planning, data gathering, evaluation, and decision making projects for units of university and area agencies and businesses. Students exercise decision making power in all aspects of the firm: project solicitation, fee setting, expenditures. Prerequisite: 571 or consent of instructor. Graded *S/U* only.

571-6 (2,2,2) Proseminar in Applied Experimental Psychology. A survey of the problem areas to which applied experimental psychology is applicable and of the principal methods employed by applied experimental psychologists. Integration of these approaches within a comprehensive metatheory. Case studies apply the information to actual and simulated application problems.

576-3 Human Engineering. Analysis of human-machine systems, human factors in the design of display and control systems, limitations and capabilities of the operator. Lecture and research or field study. Prerequisite: consent of instructor.

585-1 to 18 Advanced Seminar. Seminars of varied content for advanced students. Prerequisite: consent of instructor.

590-1 to 12 Readings in Psychology. Readings in selected topics in psychology under staff supervision. Graded *S/U* only. Prerequisite: consent of instructor.

593-1 to 24 Research in Psychology. Research under staff supervision in selected areas of psychology. Graded *S/U* only. Prerequisite: consent of instructor.

594-1 to 16 Practicum in Psychology. Practicum experience in a professional setting is offered under staff supervision in the following areas: **(a)** Applied Experimental Psychology; **(e)** Clinical Psychology; **(f)** Counseling Psychology; **(l)** Teaching of Psychology. Graded *S/U* only. Prerequisite: consent of instructor.

595-1 to 12 Internship. Placement in an approved setting required of all students in clinical, bio-clinical, and counseling psychology. Graded *S/U* only. Prerequisite: psychology graduate student.

596-3 Behavior Therapy Practicum. Practicum experiences with a variety of behavior therapies in a variety of settings. Experiences may include operant and nonoperant therapies in the clinic, school, institution, home, or community. Prerequisite: 534, 549.

597-1 to 15 Preprofessional Training. Experience given in research, teaching, or clinical or counseling activities. One hour required each semester of residence. Graded *S/U* only. Prerequisite: psychology graduate student.

598-3 Ethical and Professional Problems in Psychology. The code of ethics in professional practice, in teaching and research; problems and issues of the field are discussed; and relations to other professions and the public are considered. Prerequisite: consent of instructor.

599-1 to 6 Thesis.

600-1 to 24 Dissertation.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Radio-Television

Graduate work in the Department of Radio-Television is offered toward the Master of Arts degree in telecommunications. Four-hundred-level courses in this department may be taken for graduate credit unless otherwise indicated in the course description.

430-3 News and Public Affairs Programming. Examination of history and scope of news and public affairs programming. Effects of public affairs on programs and audiences. Responsibility of radio and television stations in news and public affairs and community relations. Issues in news and public affairs including ethics. Prerequisite: senior standing.

453-3 Educational and Public Broadcasting. The history and regulatory structure of educational and public broadcasting in the United States today, with special emphasis on organizations regulated under the Public Broadcasting Act of 1967. Methods of funding public stations, programming, and careers in educational and public broadcasting considered. Prerequisite: senior standing.

467-3 International Broadcasting. An examination of broadcasting theory related to rural audiences in the United States and abroad. History of farm broadcasting in the United States and abroad. Communications in development is explored. Research on effects on rural audiences. Open to non-majors with consent of instructor.

Prerequisite: senior standing and *C* in 300M and 300P.

481-3 Non-Broadcast Television. An examination of the special requirements of business, industrial, and medical uses of television. Management, budgeting, planning, and evaluating productions. Exploration of cable television, satellites and other technologies used in non-broadcast situations. Prerequisite: senior standing and 365, or consent of instructor.

483-3 Advanced Radio-Television Writing. Exercises in writing broadcast manuscripts including documentary, drama, and children's programming. Prerequisite: senior standing and 340, 310 or 383, and consent of instructor.

489-2 to 6 Radio Television Workshop. Advanced work in various areas of radio-television and interrelated disciplines. Prerequisite: *C* grade in 300M, 300P, and consent of instructor.

491-3 Independent Study. Area of study to be determined by student in consultation with graduate faculty. No more than two students may work on same project. Students must complete an application form which is available from the departmental adviser. Prerequisite: senior standing and consent of instructor.

500-3 Introduction to Telecommunications. Salient issues and prevailing trends in telecommunications. Introduction to telecommunications research methods with special attention given to the preparation of thesis proposals. Required for all graduate students in telecommunications.

510-3 Telecommunications Programming. Designed to train advanced students in programming strategies for telecommunications. Includes analysis of audience needs. Analysis and interpretation of program ratings. Analysis of program formats and programming strategies.

530-3 International Telecommunications. Thorough examination of telecommunications systems in other countries. Explores telecommunications across national borders and the role of telecommunications in developing countries.

532-3 Telecommunications Research. Techniques of general audience research used in the telecommunications industry, such as Nielsen, Arbitron, and other audience research operations. Emphasizes research design, construction of survey instruments, and implementation of audience research projects. Required for all graduate students in telecommunications.

570-3 Aesthetics of Telecommunications. Development of critical criteria and application of methods of analysis by which the content, aesthetic elements, and forms of television programs are objectively evaluated. Extensive reading in critical literature and several critical analyses are required.

571-3 Telecommunications Policy. Study of the history and development of telecommunications policy. Broad issues in policy are discusses, including policy relating to telecommunications management and international telecommunications. Legal research techniques are emphasized. Extensive readings required.

573-3 Telecommunications Management. Theoretical perspectives in telecommunications management. Includes examination of the organization and management of commercial and noncommercial telecommunications organizations, with an emphasis on leadership theories and techniques. Required for all graduate students in telecommunications.

580-3 Telecommunications Technology. Ongoing examination of new and emerging communication technologies, analyses of their perceived uses and potential. Creative or theoretical research required. Required for all graduate students in telecommunications.

589-3 Telecommunications and Society. The study of effects of telecommunications on various segments of society. Group and individual investigation into research methodology and literature on effects.

591-3 Individual Study in Telecommunications. Supervised research or independent investigative projects. Area of study should be determined by student in consultation with adviser and committee.

595-3 Advanced Seminar: Telecommunications. Advanced research and discussion of specialized issues in telecommunications.

598-1 to 3 Research Report. One to three hours required of all nonthesis students writing a research paper and engaging in a companion creative project. Graded *S/U* only.

599-1 to 6 Thesis. Thesis requirements may be satisfied only by a traditional written thesis. Maximum of six hours may be counted toward degree requirements.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Recreation

Courses in this department may require the purchase of supplemental materials. Field trips are required for certain courses.

401-3 Fundamentals of Environmental Education. (Same as Agriculture 401.)

423-3 Environmental Interpretation. (Same as Agriculture and Forestry 423.)

425-3 Planning and Design of Recreational Facilities. An examination of major design considerations for a variety of recreation facilities such as recreation centers, recreation sport complexes, parks, visitors centers, and natatoriums. Special attention will be given to long range facility planning. Prerequisite: senior or graduate standing.

440-15 (3 per topic) Therapeutic Recreation for Selected Populations. Students will be made aware of problems and characteristics of special population groups. Emphasis is upon the role of therapeutic recreation with these groups in institutional and community settings: **(a)** therapeutic recreation for the mentally ill. **(b)** therapeutic recreation for the developmentally disabled. **(c)** therapeutic recreation for the aged. **(d)**

therapeutic recreation for the socially deviant. **(e)** therapeutic recreation for the physically disabled. Prerequisite: 300, 302, 303 or consent of department.

445-3 Outdoor Recreation Management. Philosophy and principles underlying the growth and development of outdoor recreation management. Outdoor recreation is examined in terms of historical values, long range planning, site design, visitor needs, and environment impact. A laboratory cost of up to $14 may be required. Prerequisite: 300, 302, 303 or consent of department.

460-3 Therapeutic Recreation Management. Organization and administration of therapeutic recreation programs in hospitals, nursing homes, schools for the retarded, detention centers, prisons, and other institutions. Emphasis on programs for special populations in the community setting. Prerequisite: 300, 302, 303 or consent of department.

461-3 Program Design and Evaluation for Therapeutic Recreation. To equip the student with skills necessary to systematically design and evaluate programs. Philosophy and nature of systems, system analysis, program implementation and program evaluation. Prerequisites: 300, 302, 303, one section of 440, or consent of department.

462-3 Facilitation Techniques in Therapeutic Recreation. This course is designed to provide an understanding of the basic processes and techniques of therapeutic recreation and to develop technical competencies necessary for the provision of quality therapeutic recreation services. Emphasis is on the skillful application of various processes and techniques to facilitate therapeutic changes in the client and the client's environment, thus enabling the development of an appropriate leisure lifestyle.

465-3 Advanced Administrative Techniques. Designed to examine current administrative topics in recreation such as practices and trends in budget and finance, legal aspects, grant writing, personnel practices and policies, and others. Prerequisite: 365.

475-3 to 39 (3 per topic) Recreation Workshop. Critical examination and analysis of innovative programs and practices in one of the following areas: **(a)** budget and finance, **(b)** campus recreation services, **(c)** commercial, **(d)** maintenance of areas and facilities, **(e)** outdoor recreation, **(f)** personnel, **(g)** technological advances, **(h)** therapeutic recreation–aging, **(i)** therapeutic recreation–developmental disability, **(j)** therapeutic recreation–emotional illness, **(k)** therapeutic recreation–physical disability, **(l)** therapeutic recreation–prisons and detention centers, **(m)** tourism.

485-2 to 12 Practicum in Outdoor Education. A supervised experience in a professional setting. Emphasis on administrative, supervisory, teaching, and program leadership in outdoor, conservation, or environmental education setting. Costs for travel are the responsibility of the student. Prerequisite: consent of instructor.

500-3 Modern Concepts of Leisure. This course explores the meaning of leisure, recreation, and play from a philosophical and psychological perspective. The historical and contemporary relationships among work, time, lifestyles, and leisure are analyzed. In addition, the course attempts to develop students' viewpoints toward these topics in order that they formulate a philosophy of leisure. Required of all majors.

501-3 Personnel in Leisure Services. This course will examine administrative issues regarding personnel in leisure delivery systems. Topics include: leadership theory, selection and training, legislation, collective bargaining, motivation, performance appraisal, power and gender. Prerequisite: 365.

502-3 Revenue Production for Leisure Service Organizations. An integrative view of revenue production for leisure service organizations. Numerous practices of generating income, such as fees and charges, facility rental, bonds, investments, and public/private cooperative development will be examined in relationship to their ability to aid an organization in achieving its stated objectives. Prerequisite: 365.

503-3 Managing and Marketing Leisure Services. An examination of the critical functions of a manager in public and private leisure service organizations. Particular topics include goal and policy development, ethics, risk management, fiscal management, and facility operations. Special attention is given to the leisure service managers role in marketing recreation. Prerequisite: 365.

508-3 Trends and Global Issues in Leisure Services. This course will study the various issues and trends that affect leisure delivery systems. This course will be the culminating seminar for graduate students in Recreation. Prerequisite: 500, 501, 502, 550.

524-3 Professional Skills in Therapeutic Recreation. This course focuses on professional skills necessary at the administrative and supervisory level. Program and staff development, conference presentations, and inservice training, grantsmanship, article writing, budgeting, consultation, and public relations comprise the core of the course. Prerequisite: 460, 461, or consent of department.

525-3 Recreation for Special Populations. Planning, organizing, selecting, evaluating, and adapting activities to a variety of institutional and community settings. Prerequisite: 500 or consent of department.

526-3 Seminar in Current Issues in Therapeutic Recreation. This course focuses on current issues in therapeutic recreation services including credentialing, accreditation, professional associations, legislation, research, and other relevant issues. Prerequisites: 524 or consent of department.

550-3 Research in Recreation. Critical analysis of the most significant research studies in park and community, special populations, commercial and outdoor recreation. Prerequisite: 530.

560-9 (3 per topic) Seminar in Recreation. Major issues, trends, and cultural, economic and social significance in **(a)** park and community, **(b)** therapeutic recreation and individuals with disabilities, and **(c)** commercial recreation. Prerequisite: 500 or consent of department.

565-3 Seminar in Environmental and Outdoor Education. Discussion of individual projects, presentation of research problems and dissertation topics. Prerequisite: consent of instructor.

575-1 to 6 Individual Research. Selecting, investigating, and writing of a research topic under the personal supervision of a member of the department. Designed to help the student to develop ability to design, conduct, analyze, and interpret research related to the problem of leisure. Not more than three hours may count toward master's degree. Prerequisite: consent of instructor.

580-1 to 6 Readings in Leisure and Recreation. Readings in selected topics in leisure and recreation under staff supervision. Not more than three hours may count toward master's degree. Prerequisite: consent of instructor.

596-1 to 6 Field Work in Recreation. Field work in an approved recreation department. Field work is in the student's field of interest. Supervision under approved agency officer in charge and a member of the department. Prerequisite: major in recreation and permission of the department.

599-1 to 3 Thesis. Prerequisite: consent of department.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Rehabilitation

Courses in this unit may require the purchase of supplemental materials not to exceed $10 per course. Field trips are required for certain courses.

400-2 to 3 Introduction to Rehabilitation. An introduction to the broad field of rehabilitation, to include the processes (services), facilities and personnel involved. Note: students can enroll in the didactic portion for two credits, or three credits if they elect the field trips. No student can take the field trips alone without taking the didactic portion as well.

401-3 Rehabilitation for Non-Majors. An introduction to the process and practice of rehabilitation for students not majoring in this field. An overview of counseling, evaluation, physical restoration, adjustment services, job placement, and rehabilitation administration will be presented. Also a survey of client characteristics will be provided. Clients with sensory, physical, developmental, and psychiatric disabilities will be discussed. Career opportunities in rehabilitation will be examined.

403-3 Independent Living Rehabilitation. Survey of principles and methods of independent living for the handicapped with attention to client assessment for rehabilitation, effective techniques for specific handicapped groups, and the variety of types and organization of independent living programs.

405-3 Modern Gerontology. (Same as Health Education 444.) Study of aging with a multdisciplinary focus. Presentations will include aspects of aging related to: psychology, sociology, physiology, public policy, law history, philosophy, literature, social welfare, rehabilitation, economics, business, communications, education, international issues, health and recreation.

406-3 Introduction to Behavior Analysis and Therapy. A survey of the principles and procedures in behavior analysis and therapy and the scope of its application to human needs and problems.

419-1 to 3 Cross-Cultural Rehabilitation. (Same as Black American Studies 490.) Major focus on the relationship/comparison of basic cultural, economic, and psychosocial processes relative to the rehabilitation of people in contemporary societies. Prerequisite: consent of instructor.

421-3 Vocational Development and Placement. Relates the psychosocial meaning of work, process of vocational development, theories of occupational choice and labor market trends to current and innovative methods of job development, selective placement, and follow-up with the handicapped. Prerequisite: consent of instructor.

425-1 to 6 Developing Employment Opportunities. Designed to train rehabilitation personnel in the attitudes, methods, and skills pertinent to placement of handicapped persons in competitive and other occupations. Prerequisite: special standing and consent of instructor.

431-3 Assessment of Procedures in Rehabilitation. Review of fundamental bases of measurement, criteria for evaluating tests, practice with representative instruments in major categories, and the use of tests and work samples in assessing the handicapped's functioning abilities and work potential. Prerequisite: consent of instructor.

436-3 to 4 Vocational Evaluation and Adjustment Services. Introduction to the philosophies of evaluation and adjustment services in rehabilitation settings with emphasis on the rationale for use of psychometric testing, functional behavioral analysis, work sampling, situational assessment, and on the job evaluation in relation to the development of individualized adjustment service programs.

445-3 to 12 Rehabilitation Services with Special Populations. Procedures and programs pertinent to the care and treatment of special populations. Three semester credits will ordinarily be granted for each unit. Prerequisite: consent of instructor.

(a)-9 (3, 3, 3) Alcohol and Drug Abuse.
(b)-9 (3, 3, 3) Emotionally Disturbed.
(c)-9 (3, 3, 3) Juvenile Offender.
(d)-9 (3, 3, 3) Mental Retardation.
(e)-9 (3, 3, 3) Physically Disabled.
(f)-9 (3, 3, 3) Public Offender.
(g)-9 (3, 3, 3) Sensory Disabled.
(h)-9 (3, 3, 3) Developmental Disabilities.

446-3 Psychosocial Aspects of Aging. Selected theories of psychosocial aspects of aging will be presented and the psychological and sociological processes of aging with the ensuing changes will be related to these conceptual frameworks. Included for discussion and related to field experience will be such concerns as stress reactions to retirement, physical disabilities, impact of reduced economic resources, and other personal-social changes in aging. Topics will ad-

dress the knowledge base needed by students concerned with rehabilitation of aging clients in institutional, community and home settings. Therapeutic techniques to ameliorate these stresses will be an integral part of the course.

447-3 Biomedical Aspect of Aging. The aging process in a life-span developmental perspective; biological theories of aging, physiological changes in middle and old age and their effects on behavior, performance potential, and psychosocial functioning; senility and other age-related disabilities, their prevention and management; geriatric health maintenance and rehabilitation; institutionalization; death and dying. No prerequisites.

451-3 to 4 General Rehabilitation Counseling. A didactic and experiential analysis of the underlying premises and procedures of individual and group counseling in rehabilitation settings. Prerequisite: consent of instructor.

452-3 Behavior Change Applications. An overview of the development and evolution of applied behavior analysis. Applications of behavior analysis to problems of social significance in institutions, schools, and communities are surveyed. Prerequisite: 406 or consent of instructor.

453-1 to 4 Personal and Family Life Styling. The academic and personal competencies that are characteristic of fully-functioning, integrated persons within the context of our twentieth century environment will be systematically reviewed for adoption in every day living as well as in professional functions. Participants will focus on and experience life styling theories, models, and skills for their own growth and development and learn to assess basic risk-factors in their rehabilitation clients and families prior to helping them program a more balanced, synergistic, and holistic approach to living. Prerequisite: consent of instructor.

461-3 Introduction to Alcoholism and Drug Abuse. Orientation and introduction to a variety of topics related to alcohol and drug abuse; surveys history, theories of cause and development, consequences of abuse, classes and types of drugs, legislation, and other current issues relating to substance abuse and addiction.

468-3 Sexuality and Disability. Research and rehabilitation practices pertaining to the unique psychosexual aspects of various chronically disabling conditions will be examined.

471-3 Rehabilitation and Treatment of the Alcohol and Drug Abusers. A comprehensive examination of substance abuse treatment and rehabilitation; focus on various treatment approaches, treatment settings, and types of counseling to include an overview of individual, group, and family techniques; the rehabilitation counselor's role is addressed and necessary skills in treating drug and alcohol abusers. Prerequisite: 461 or consent of instructor.

479-3 Technical Writing in Rehabilitation. Fundamentals of writing skills for rehabilitation specialists, including preparation and drafting of program/grant proposals, vocational evaluation/work adjustment reports, news releases and other publicity materials. Prerequisite: consent of instructor.

490-1 to 6 (1 to 3 per semester) Readings in Rehabilitation. Supervised readings in selected areas. Prerequisite: consent of instructor.

494-1 to 12 Work Experience in Rehabilitation. Rehabilitation 494 and 594 both cannot be counted for a graduate degree, only one or the other can satisfy requirements toward a master's degree. Prerequisite: consent of department.

501-3 Rehabilitation Foundations. Focuses upon facilitative interpersonal communication skills necessary in rehabilitation practice. The course provides theory and practice in facilitative interpersonal communication in counseling, behavior therapy, and administration and services. Prerequisite: consent of instructor.

503-3 Basic Behavior Analysis. Philosophy, terminology, and basic methodology of experimental and applied behavior analysis. Focuses on a variety of operant and respondent conditioning procedures for shaping new behaviors and modifying established behaviors. Prerequisite: consent of department.

504-3 Foundations of Rehabilitation Research. This course includes: the logic of scientific inquiry; the concepts of research questions and hypotheses; the notion of variables; the relationship among theoretical constructs, operationalism, and measurement instrument reliability and validity; the concepts of control, internal validity, and casual inference; sampling methods and external validity; and experimental and descriptive research. Prerequisite: enrollment in Rh.D. degree program or consent.

508-3 Complex Behavior Analysis. Experimental analysis of procedures that result in acquisition, maintenance, and attenuation of complex individual and social behavior. Prerequisite: consent of instructor.

509-6 (3,3) Behavior Analysis Research Designs. Focuses on behavior analysis research design and methodology. Three semester hours will be granted for each unit. **(a)** Single subject experimental designs, **(b)** group experimental designs.

512-3 Legal and Ethical Issues in Behavior Analysis. Focuses on federal and state legislation, litigation, policies, guidelines, and other forms of legal and ethical control of the professional practice of behavior analysis and therapy. Implications for research and service will be discussed.

513-1 to 4 Medical and Psycho-Social Aspects of Disability. A review of the impact of disease and trauma on the human system with special attention on the effects physical limitations and socio-emotional correlates have on human functioning and the rehabilitation process. Prerequisite: consent of department.

515-3 Behavioral Applications to Medical Problems. Examines the use of behavior change procedures and applied behavior analysis in the treatment and rehabilitation of medically related problems such as obesity, alcoholism, headaches, hypertension, and cerebral palsy; also, compliance to medical regimens, e.g., diabetes, dental hygiene, exercise; and promotes the utilization of health facilities and community health programs. Issues in training medical personnel to disseminate behavior change programs are also covered. Prerequisites: 409 and 503 or consent of instructor.

523-3 Job Restructuring for the Handicapped. Introduction to the analysis and measurement of job tasks and the design and layout of

work environments with special emphasis on the use of jigs, job restructuring, and prosthetic environments for the handicapped. Prerequisite: 421 and consent of instructor.

525-3 Developing Job Readiness. Designed to prepare job development and placement specialists and other rehabilitation personnel to develop programs of job readiness aimed at training individuals with handicapping conditions to seek and hold gainful employment. Prerequisite: consent of the instructor.

526-3 Issues in Supported Employment. Focuses on community work options for adults with severe disabilities. These community work options, supported work and supported employment, the issues surrounding transition from school to work, and the difference between sheltered and nonsheltered employment will be discussed from philosophical and practical viewpoints.

531-3 Individual Assessment Procedures in Rehabilitation. Thorough familiarization and practice with independent assessment devices used in program selection and job placement of individuals with various handicaps. Prerequisite: 431 and consent of instructor.

533-3 Vocational Appraisal. An extensive exposure to instruments designed for use with vocational rehabilitation clients. Administration and interpretation of a wide variety of instruments used to gain information to be used in planning for vocational development. Both didactic and experiential to include consideration of information obtained from interviews, tests, and other diagnostic techniques. Prerequisite: consent of instructor.

535-3 Behavioral Observation Methods. Behavioral targeting, observational recording techniques, and issues of validity and reliability of measurement relevant to rehabilitation will be examined. Prerequisite: previous or concurrent enrollment in either 409, 452, or 503, or consent of instructor.

543-3 Child Behavior. A systematic analysis of child behavior. Included is an examination of popular books on child rearing. Emphasizes approaches for remediation of behavior disorders. Prerequisite: consent of instructor.

545-3 Behavior Modification in Mental Retardation. Consideration of behavioral principles as applied in the development of responsive behavior in mentally retarded persons. Prerequisite: consent of instructor.

553-3 Learning Therapies for Special Populations. Describes treatment, rehabilitation, and teaching procedures with the emotionally disturbed, problem drinkers, mentally retarded, and autisms and other disruptive behaviors. Prerequisite: consent of instructor.

554-3 Behavior Therapy. Considers research findings and basic principles of behavior modification relative to such behavior therapies as desensitization, assertive training, aversive conditioning, and behavior rehearsal. Prerequisite: consent of instructor.

557A-3 Self-Regulation of Behavior: Self-Control. The course provides a thorough review of self-control techniques and their application to habit disorders such as smoking, eating, exercise, time-management, and nervous habits. Prerequisite: consent of instructor.

557B-3 Self-Regulation of Behavior: Biofeedback. The course provides a comprehensive review of experimental and clinical studies of biofeedback. It concentrates on stress related disorders and provides supervised laboratory experience. A $10 laboratory fee is charged. Prerequisite: consent of instructor.

558-3 Rehabilitation of Special Alcoholic and Drug Abusing Populations. Emphasis is on the characteristics, assessment, rehabilitation, and unique problems of drug and alcohol abusers within specific populations. Particular attention is given to substance abuse of women, minorities, elderly, adolescents, homosexuals, and disabled. Prerequisite: 461 or consent of instructor.

560-3 Private Sector Rehabilitation. A comprehensive introduction to many of the unique characteristics of rehabilitation services offered within the private-for-profit sector which can be applied by practitioners on a national basis.

561-3 Rehabilitation and the Courts. The role of the rehabilitation worker in a variety of court proceedings will be explored. Emphasis will be on Social Security disability and workmen's compensation cases. The course will involve review of evidence and preparation for testimony. There will be opportunities for mock trials and observation of actual legal proceedings. Some field trips may be required.

562-3 Rehabilitation Facilities and Developmental Centers. Surveys the history and development of rehabilitation facilities and developmental centers for the handicapped and then focuses on current principles and practices of these facilities in terms of nature, classification, objectives, standards, philosophies, theories, programs of services, organization, administration, financing, and trends for the future. Prerequisite: consent of instructor.

563-3 Behavioral Analysis: Community Applications. All aspects of behavior analysis applications in the community are examined including historical development, the "state of the art", practical issues, and obstacles to conducting behavioral analysis/community research; future trends and directions. Prerequisite: 503 or consent of instructor.

564-3 School Related Behavior. Analysis of student and teacher behavior and the behavioral methods of improving teaching and learning. Prerequisite: consent of instructor.

565-3 Private Practice Rehabilitation. An examination of the establishment of a private rehabilitation practice. How to set up a private practice, the do's and don'ts, and attracting and keeping business are detailed. Knowledge concerning how insurance companies evaluate rehabilitation facilities is critical.

566-3 Alcoholism, Drug Abuse and the Family. The family system model is emphasized as a rehabilitation procedure for drug and alcohol abuse. Examines etiology of drug and alcohol abuse, assessment procedures, treatment and rehabilitation, and associated problems such as spouse or child abuse, divorce, and incest from a family context. Prevention techniques are additionally covered. Prerequisite: 461 or consent of instructor.

568-3 Sexual Behavior and Rehabilitation. Consideration of human sexual behavior includ-

ing basic anatomy and physiology; sexual facts and fallacies; and analysis of sexual inadequacies, variances, and deviances. Special emphasis is placed on the application of therapies for the rehabilitation of people with sexual problems. Prerequisite: consent of instructor.

570-3 Rehabilitation Administration. Problem solving approach to current issues in organizational structure and management functions in public and voluntary rehabilitation agencies, decision making, leadership, program development, and evaluation. Prerequisite: consent of instructor.

573-3 Programming, Budgeting, and Community Resources. Designed to prepare the student to develop and operate comprehensive or specialized rehabilitation programs with special attention to resource development, fiscal management, and community and public relations. Prerequisite: 570 or consent of instructor.

574-3 Staff Training and Development. This course prepares the student to design, implement, and supervise an institutional program to train staff in methods of direct service to the institution's clients. Each student will actually design and submit a program through simulation. Lecture/workshop format.

575-3 Case Management in Rehabilitation. Basic procedures in providing and coordinating available human services based on individual need in the context of a professional-client relationship, and the basics of recording and reporting such services. Prerequisite: consent of department.

576-2 to 3 Development and Supervision of Rehabilitation Employees. Current and progressive supervisory practices in rehabilitation with emphasis on employee development through in-service training, periodic evaluation, and related methods. Prerequisite: consent of instructor.

578-3 Program Evaluation in Rehabilitation. An analysis of the development and utilization of a program evaluation system in rehabilitation settings with focus given to system design, monitoring techniques, and service program development. Students will be trained in the advanced practice of program evaluation techniques and their application to rehabilitation settings. Prerequisite: consent of instructor.

579-3 Advanced Fiscal Management in Rehabilitation. Application of fund and functional accounting in rehabilitation to include fiscal reporting and record keeping, fiscal planning, and management in rehabilitation. Prerequisite: 570 and 573.

580-3 Professional and Community Relations in Rehabilitation. Examination of the linkages and needs of rehabilitation programs and agencies in the area of community and professional relations, with special reference to the role of administrator. Application of marketing principles to the management of external relations in rehabilitation settings. Prerequisite: consent of instructor.

581-3 Professional Issues in Rehabilitation. Focus is on legal and ethical issues and issues related to legislative and public policy formulation. Implications for rehabilitation programs, practice, and research are emphasized.

582-1 to 4 Seminar in Rehabilitation Services. Special consideration of factors in the organization and management of rehabilitation services. Prerequisite: consent of instructor.

583-1 to 4 Seminar in Work Evaluation. Select attention to procedures/models for assessing work readiness of handicapped personnel. Prerequisite: consent of instructor.

584-1 to 6 (1 to 2 per semester) Seminar in Behavior Analysis and Therapy. Special topics and new developments in modifying human behavior. Prerequisite: consent of instructor.

585-1 to 4 Seminar in Counseling/Coordination Services. Consideration of special issues in counseling and delivery of services. Prerequisite: consent of instructor.

586-3 Seminar in Job Development and Placement. Consideration of special issues in job development and placement philosophy, techniques and research concerning individuals with handicapping conditions. Prerequisite: consent of instructor.

587-3 Seminar in Correlates of Disability. A systematic analysis of the behavioral socio-cultural implication of disabling conditions. Emphasizes the rehabilitation process in remediation of handicapping conditions. Prerequisite: 513 or consent of instructor.

588-3 Seminar in Research in Rehabilitation. Advanced seminar focusing upon specialized and advanced topics in research in rehabilitation. This course is designed to prepare doctoral students in rehabilitation with the special tools needed to carry out doctoral dissertation and other advanced research projects. Prerequisite: consent of instructor.

589-1 to 18 (1 per semester) Professional Seminar in Rehabilitation. The course involves advanced level presentations focusing on current research, applied practices, and innovations in rehabilitation. Presentations are made by faculty, graduate students, and guest experts. A minimum of four semester hours required for Doctor of Rehabilitation degree.

591-1 to 18 Independent Projects in Rehabilitation. Systematic readings and development of individual projects in pertinent rehabilitation areas. No more than six hours may be counted toward the master's degree. Prerequisite: consent of instructor.

592-1 to 16 Professional Supervision in Rehabilitation. Experience provided in the supervision of research, teaching, and rehabilitation services. No more than four hours may be taken in any semester. Prerequisite: doctoral student in rehabilitation and consent of instructor.

593-1 to 18 Research in Rehabilitation. Systematic investigation of factors and procedures relevant to rehabilitation. No more than six hours may be counted toward the master's degree. Prerequisite: consent of instructor.

594-1 to 12 Practicum in Rehabilitation. Supervised experiences in agencies in rehabilitation. **(a)** Administration. Rehabilitation facilities management/supervision, in planning, programming, and evaluation. **(b)** (Same as Psychology 596.) Behavior modification. Application of behavioral analysis/methods in human treatment and in management. **(c)** Counseling. Development of counseling skills with individuals and groups to

include work related functions. Prerequisite: consent of department.

595-1 to 12 Internship in Rehabilitation. Extended practice in rehabilitation settings cooperatively guided and supervised by agency staff and university faculty. Prerequisite: 594 and consent of department. Graded *S/U* only.

599-1 to 6 Thesis. Prerequisite: consent of instructor.

600-1 to 30 (1 to 12 per semester) Dissertation. Minimum of 24 hours to be earned for the Doctor of Rehabilitation degree. Prerequisite: doctoral candidate in rehabilitation.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Religious Studies

There is no graduate program offered through religious studies. Four-hundred-level courses in this unit may be taken for graduate credit unless otherwise indicated in the course description.

410F-3 Comparative Religion. (See Anthropology 410F.)

476-4 Politics and Religion in Comparative Perspective. (Same as Sociology 476.) Examination of the interaction between politics and religion in the United States, with a comparative look at other nations and global regions. Consideration given to politics and religion as cultural and institutional systems, and to the impact of each upon the other.

Science

500-2 Science Information Sources. Methods and procedures to efficiently exploit the scientific literature are discussed. The two-hour class discussion will be supplemented by practical exercises in library usage. Prerequisite: consent of instructor.

501-4 (2,2) Research Transmission Electron Microscopy. (a) Theory of design of electron microscope, lenses, vacuum systems, alignment, speciman preparation, and darkroom. **(b)** Practical experience in use of transmission electron microscope and specimen preparation.

502-4 (2,2) Research Scanning Electron Microscopy. (a) Theory of design for scanning electron miscroscope, lenses, vacuum systems, alignment, specimen preparation for biologists and materials scientists, darkroom. **(b)** Laboratory practical experience in use of scanning electron miscroscope and specimen preparation. Laboratory fee $100.

503A-1 to 3 Science for Elementary School Teachers. In-depth studies of selected basic concepts in general science for teachers of upper-level elementary grades. Topics include cells and simple organisms, characteristics of vertebrates, plate tectonics, solar system, nature of matter, and magnetism. Prerequisite: currently teaching in an elementary school.

503B-1 to 3 Science for Elementary School Teachers. In depth studies of selected basic concepts in general science for teachers of upper-level elementary grades. Topics include human biology, characteristics of high plants, Earth's building blocks, the atmosphere, forces, and simple machines. Prerequisite: currently teaching in an elementary school.

504-9 (1 to 3 per topic) Selected Topics in Science for Teachers. The course consists of selected basic concepts in general science for practicing teachers. Within a given semester a broad area is selected within either the biological sciences or the physical/earth sciences. Topics currently include: **(a)** basic stream ecology; **(b)** biological assessment of polluted streams; and, **(c)** wetland ecosystems. Other topics may be added as deemed necessary. This course may not be used for graduate credit by College of Science majors. Prerequisite: currently teaching in an elementary school.

Social Work

421-3 Social Welfare Policy. This course provides an in depth examination of social welfare structure, functions, policy, and programs, as well as strategies for shaping and changing policy. Prerequisite: 375.

450-1 to 6 (1 per topic) Seminar in Special Issues for Social Work. (a) Practice. **(b)** Policy and planning. **(c)** Public welfare services. Topics will be selected from these three areas. Limited to no more than three credit hours per semester. May be repeated as topic varies up to six semester hours. Prerequisite: junior standing and consent of instructor.

463-2 Social Work with the Aged. Basic concepts of social work methods applied to the older adult group. Characteristics of the aged group, its needs and potentials. Social trends and institutions involved in services to the aged. Prerequisite: consent of instructor.

466-3 Public Policies and Programs for the Aged. An introduction to public policy, program and planning for the aged. A framework is utilized for analyzing policy issues, programs and research in such areas as income maintenance, long term care, transportation, leisure time, housing, and social services in order to aid present and future practitioners who work with the aged. Prerequisite: consent of instructor.

489-3 Field Service Seminar. (Same as Community Development 489.) This seminar is to be taken concurrently with 495 or Community Development 495. Prerequisite: consent of instructor.

495-1 to 6 Advanced Field Service Practicum in Southern Illinois. (Same as Community Development 495.) This course is directed at upperclassmen and graduate students volunteering

service to community, social service, or health agencies in southern Illinois. Credit based on time spent in direct service. Approval of agency required for registration. Mandatory Pass/Fail.

496-1 to 6 Independent Research in Social Work. Provides opportunity for students to conduct independent research with the guidance of a faculty member. Topics of research are identified by the student and faculty member. Prerequisite: consent of instructor.

500-3 Human Behavior and the Social Environment I. Examination of the theoretical basis of the development and interrelational aspects of individuals. Normal developmental stages and impacts of social systems on the growth of individuals are emphasized. Prerequisite: admission to program.

501-3 Human Behavior and the Social Environment II. Behaviors as affected by organizational, community and environmental stressors across the life span are discussed. By comparing normal expectations of development and coping, leverage points of social work intervention are idenitified. Prerequisite: 500.

502-3 Perspectives on Human Behavior and the Social Environment: Group, Community, and Organizational Influences. Selective examination of behaviors as affected by group, community, organizational, and environmental stressors across the lifespan and implications for social work intervention. Prerequisite: consent of director.

504-2 Ethnic Diversity and Social Work Practice. Examination of problem solving mechanisms unique to various ethnic groups and identification of their inherent resources for ameliorating or coping with personal, familial, or community problems. Implications of these characteristics to social work practice are discussed. Prerequisite: admission to program.

505-2 Foundations of Social Work and Services. Examination of both historical and philosophical developments of the social welfare system as an institution and social work as a profession in the United States. Future trends in social work education and practice are predicted based on social and political mentality prevailing at present time. Prerequisite: admission to program.

506-3 Social Welfare Policy Analysis and Design. Development of a basis for professional social worker's formulation and analysis of social welfare policy and services. Generic principles of policy development and analysis are examined in philosophical and sociopolitical contexts. Roles of the social work profession in the process of policy making are identified and examined. Prerequisite: 505.

510-3 Social Work Practice I. This course provides foundation knowledge about social work process, methods, and skills appropriate for practice with individuals, families, and groups. Prerequisite: admission to program.

511-3 Social Work Research. This course emphasizes the importance of scientific inquiry within social work practice and covers the application of basic concepts of research methodology to social work including problem formulation, research design, sampling, measurement, and data analysis. This includes research approaches that may be used in the evaluation of one's own practice. Prerequisite: admission to program.

512-3 Research Design/Theory Building. Selective examination of inductive and deductive methods in social work knowledge building. Included are tools relevant to evaluating programs and one's own practice. Prerequisite: consent of director.

520-3 Social Work Practice II. Foundation practice focusing on process, methods, and skills for work with groups, communities, and organizations. Prerequisite: 510.

522-3 Social Welfare Policy Development and Analysis. Selective examination of the historical, philosophical developments of the social welfare system and social work as a profession in the United States. Generic principles of policy development and analysis are identified and examined. Prerequisite: consent of director. **531-4 (2,2) Selected Topics in Advanced Social Practice I. (a)** Psychopathology for social work practice focusing on advanced and in-depth knowledge of clinical social work practice models, definitions of dysfunctional behavior, and classification of abnormal functioning. Prerequisite: completion of foundation or transition courses. **(b)** Substance abuse and social work practice focusing on in-depth knowledge of social work assessment of both individuals and families involved in substance abuse. Students are provided with advanced knowledge and skills in various social work intervention models applicable to the area of substance abuse. Lastly, special needs of diverse populations are addressed. Prerequisite: completion of foundation or transition courses or School consent.

532-2 Evaluative Research Practicum. Design and conduct evaluative research individually or collectively. A written critical scientific evaluation of a macro program from the perspective of efforts, efficiency, effectiveness, cause-effect relationship, or adequacy is required. Prerequisite: completion of foundation or transition courses or School consent.

533-2 Social Work Practice in the Schools. In-depth examination of the history and practice of social work in primary and secondary schools. Roles of school social workers and practice approaches are emphasized. Prerequisite: completion of foundation or transition courses and admission to the School of Social Work certification program.

535-2 Legal Aspects of Social Work Practice. Examination of law and legal procedures that relate directly to social work practice in general. Legal perspectives of a specific concentration field of practice are discussed in depth. Prerequisite: completion of foundation or transition courses or School consent.

541-4 Social Work Practicum I. Educationally directed on-site field practice with concurrent seminar. Practicum is equivalent to two days per week for 15 weeks and seminar meets once per week for two hours. Graded *S/U*. Prerequisite: admission to program.

542-4 Social Work Practicum II. Second educationally directed on-site field practice with concurrent seminar. Continuation of 541. Graded *S/U*. Prerequisite: 541.

543-6 Social Work Practicum III. Concentration specific in an approved agency with appropriate supervision. Practicum will be equivalent to three days per week for 15 weeks with a concurrent seminar. Graded *S/U*. Prerequisite: 542.

544-6 Social Work Practicum IV. A continuation of the concentration specific practicum of three days in the field for 15 weeks with a concurrent seminar. Graded *S/U*. Prerequisite: 543.

546-4 (2,2) Selected Topics in Advanced Social Work Practice II. **(a)** Advanced knowledge and skills particularly useful for leadership positions in the social work profession. Specific topics to be determined by the school identifying students' academic needs. Prerequisite: completion of foundation or transition courses or School consent. **(b)** Social work management and supervision focusing on social service organizations. Student is provided with theories, models, and techniques of modern human services management and supervision with application to case materials. Prerequisite: completion of foundation or transition courses or School consent.

550-2 Social Work Practice in Health and Mental Health Settings. Examination of social and emotional impacts of illness and death on individuals. Implications of physical and mental disorders to social work practice are discussed with particular emphasis on cultural, racial, religious, gender, and other psychosocial aspects of illness. Prerequisite: completion of foundation or transition courses or School consent.

555-2 Impacts of Health/Mental Health Policy and Programs on Social Work Practice. Introduction to health and mental health public policies and programs in the United States. Prerequisite: completion of foundation or transition courses.

556-6 (3,3) Health and Mental Health Practice. **(a)** Knowledge and skills useful for social work practice in the field of health and mental health. This course will focus on social work practice with physical and mental illness in health and mental health settings. Prerequisite: completion of foundation or transition courses. **(b)** Knowledge and skills useful for social work practice in the field of health and mental health, focusing on social work practice with acute and chronic illness in health and mental health settings. Prerequisite: completion of 556a.

557-2 Community Mental Health and the Black Community. Introduction to clinical techniques useful for facilitating community functions and changes within the context of the Black experience. An exploration of the culture of the Black community builds the basis for community mental health service strategies. Prerequisite: completion of foundation or transition courses or School consent.

558-2 Women and Community Mental Health. Examination of mental health problems of American women and exploration of effective interventive strategies. Prerequisite: completion of foundation or transition courses or School consent.

559-2 Aging and Mental Health. Examination of the nature and etiology of mental health problems facing older Americans and review of research reports to build a theoretical basis for mental disorders. Prerequisite: completion of foundation or transition courses or School consent.

560-2 Social Work Practice with Children and Youth. Advanced level of knowledge and skills that are relevant to the prevention and amelioration of problems related to maladaptive parent-child interaction, parental inability to provide child care, parents' unrealistic expectations of a physically and mentally limited child. Prerequisite: completion of foundation or transition courses or School consent.

565A-2 Child Welfare Policy and Program Issues. Examination of child welfare policies and programs in terms of adequacy and effectiveness. Organizations of child advocacy and politics of American families are reviewed. Prerequisite: completion of foundation or transition courses.

565B-2 School Social Work Policy and Program Issue. Analysis of the school as a social system with attention to the rights and responsibilities of its personnel and citizen clients and assessment of law and public policy regarding education as a continuum from preschool to post high school. Prerequisite: 560.

566-6 (3,3) Child Welfare Practice. **(a)** Knowledge and skills useful for social work practice in the field of child welfare. The course focuses on in-home services to families and children. Prerequisite: completion of foundation or transition courses. **(b)** Knowledge and skills useful for social work practice in the field of child welfare and family services. The course focuses on substitute care for children who are not in their homes. Prerequisite: completion of 566a.

567-2 Seminar in School Social Work. Exploration of policies, programs, practice, and legislative trends affecting public service in school social work. Prerequisite: 533.

570-2 Gerontology and Social Work. Examines the major psychosocial and ecological theories of human ageing within the value framework of social work practice. Extrapolations of those theories and application of them to social work practice and research are emphasized. Prerequisite: completion of foundation or transition courses or School consent.

575-2 Policy and Program Issues of Aging. Examination of public policies that impact on the quality of life of the elderly. Major actors and their effectively exerted advocacy strategies are identified and evaluated. Future policy issues are discussed. Prerequisite: 570.

576-1 to 6 Selected Topics in Aging Policy and Program Issues. Examination of selected knowledge and skills useful for gerontological social work practice. In-depth study on specific topics will be conducted. Prerequisite: 570.

577-1 to 4 Selected Topics in Research Methodology. Exploration and actual use of computer programs for social work data analysis. Graded *S/U*. Prerequisite: Completion of foundation or transition courses or School consent.

578-2 International Social Work. Discussion of nature and scope of international social services including social welfare problems of the world. Review of welfare programs in the Third World countries and of social service programs in the developed countries. Prerequisite: completion of foundation or transition courses or School consent.

598-1 to 4 Social Work Research Paper. Preparation of a final research paper as partial requirement for the M.S.W. degree. Graded *S / U* only. Prerequisite: completion of foundation or transition courses and approval of the School.

599-3 Thesis in Social Work. A partial and optional requirement for the M.S.W. degree. A written report of the student's research project in the area of concentration. Prerequisite: completion of all foundation or transition courses or School consent. Graded **S/U** only.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S / U* or *DEF* only.

Sociology

406-4 Social Change. Theories and problems of social change; their application, with emphasis on the modern industrial period.

412-4 American and Soviet Society. A sociological perspective on American and Soviet society. Combines a macroscopic analysis of major social institutions with microscopic examination of everyday life; shows how each social system molds personality and how socially acquired habits reinforce the social system. Designed to meet the needs of students interested in comparative and political sociology as well as those searching for an understanding of the problems of the two super powers. Prerequisite: none, 301 recommended.

415-3 Logic of the Social Sciences. (See Philosophy 415.)

423-4 Sociology of Gender. (Same as Women's Studies 442.) Examines social science theory and research on gender issues and contemporary roles of men and women. The impact of gender on social life is examined on the micro level, in work and family roles, in social institutions, and at the global, cross-cultural level.

424-4 Social Movements and Collective Behavior. A sociological analysis of the behavior of collectivities in uninstitutionalized settings; crowds, masses, publics, and social movements will be examined with relation to their social and cultural backgrounds, forms of expression and organization, and their functions in society.

426-4 Social Factors in Personality and Adjustment. Review of selected theoretical orientations and research traditions in social psychology. Comparison of different theoretical and methodological approaches — symbolic interaction, role theory, developmental and social psychology, theories of attitude organization and change, studies of belief and value systems, theories of socialization.

435-4 Social Inequality. Discussion of theories and evidence pertaining to the socio-structural causes and consequences of inequality based on social class, prestige, power, gender, wealth, and income.

437-4 Sociology of Development. Survey of sociological theories of development including modernization, dependency, and world-system perspectives. Problem areas of development are examined: economic growth, state structures, multinational corporations, labor force, education, migration, population, and women's roles.

438-4 Sociology of Ethnic Relations in World Perspective. Examines theories, concepts and research on the structure of ethnic relations and ethnic problems in contemporary societies in major world regions. Assimilationist, pluralist, secessionist, and militant types of ethnic and racial group relations are covered in selected societies. Designed for students with advanced interest in comparative ethnic relations. Prerequisite: GEB 215 is recommended.

450-4 Social Thought. A survey of Western social thought from the ancient world to the founding of the modern social sciences in the 19th century.

460-4 Sociology of Medicine. Examination of the sociological factors involved in health and illness, the role of medicine in society, the organization of medical care and health institutions in the United States, and the prospects for sociological research in this area.

465-4 Sociology of Aging. The adult life cycle from a sociological perspective, with emphasis on the later stages of adulthood. Special topics on aging include demographic aspects, family interaction, ethnicity, and cross-cultural trends.

471-4 Introduction to Social Demography. Survey of concepts, theories, and techniques of population analysis; contemporary trends and patterns in composition, growth, fertility, mortality, and migration. Emphasis is on relationship between population and social, economic, and political factors.

472-3 The American Correctional System. (See Administration of Justice 472.)

473-4 Juvenile Delinquency. (Same as Administration of Justice 473.) Nature of sociological theories of delinquency; analytical skills in studying the delinquent offenders; systematic assessment of efforts at prevention, control, and rehabilitation in light of theoretical perspectives. Prerequisite: 6 hours of social/behavioral science recommended.

474-4 Sociology of Education. Methods, principles, and data of sociology applied to the educational situation; relation of education to other institutions and groups.

475-4 Political Sociology. (Same as Political Science 419.) An examination of the nature and function of power in social systems at both the macro- and micro-sociological levels of analysis, the social bases of power and politics; and various formal and informal power structures; the chief focus will be on American society.

476-4 Politics and Religion in Comparative Perspective. (Same as Religious Studies 476.) Examination of the interaction between politics and religion in the United States, with a comparative look at other nations and global regions. Consideration given to politics and religion as cultural and institutional systems, and to the impact of each upon the other.

501-4 Classical Sociological Theory. A systematic survey of sociological theory with the fo-

cus on 19th and early 20th-century sociological thought. An in-depth examination of a selected number of thinkers whose work laid the foundation for major schools of contemporary sociology. Students are expected to be familiar with the fundamentals of sociological analysis.

502-4 Contemporary Sociological Theory. A survey of major 20th-century theoretical orientations in sociology with emphasis on their differing modes of conceptualization and alternative research programs. Students are expected to be familiar with the classics of sociological thought.

506-4 Seminar on Contemporary Sociological Theory. Recent trends in sociological theory; current approaches to the construction and application of theoretical models and their relations to empirical research. Prerequisite: 501 or consent of instructor.

512-4 Sociological Research. An overview of sociological research methods including survey, quantitative, comparative-historical, and ethnographic techniques of research. Special attention will be given to research design and implementation. Students will do one or more limited research projects and will write reports on the projects.

513-4 Methods of Historical Sociology. Analysis of methodological similarities and differences between social history and historically-oriented social sciences in the study of social change. Review of practical techniques in historical research.

519-4 Methodological Foundations of the Social Sciences. Seminar on selected problems of social science methodology; the nature of social phenomena; basic problems of epistemology, concept formation, and logic of scientific procedures. Prerequisite: consent of instructor.

521-4 Seminar in Social Psychology. In-depth examination of specific theoretical systems or substantive problems in social psychology. Students wishing specific information on the topic of the seminar should consult with the instructor for more detail. Prerequisite: 426 or consent of instructor.

526-8 (4,4) Quantitative Methods in Sociology. (a) Linear causal models as a tool in theory and research. Central tendency, variation, covariation, and correlation. Bivariate and multivariate regression models. Path analysis and related techniques. Bivariate and multivariate statistics for nominal and ordinal measures. **(b)** Application of linear models. Linear models of measurement error, reliability, and validity. Models of reciprocal causation feedback and control. The identification problem. Must be taken in a, b sequence. Prerequisite: graduate standing.

530-2 to 12 (2 to 4 per topic) Topical Seminar in Sociology. Content varies with interests of instructor and students. Prerequisite: consent of instructor.

533-4 Seminar in Social Stratification. Comparative study of power, social class, and status; conceptions of social structure and measurement techniques; explanations of social and occupational mobility; institutions and differential life-changes.

534-4 Seminar in Social Change. Overview of prevailing theories, research, and issues in social change. These include social and economic change in capitalism; modernization development and underdevelopment in the world system; gender; race and ethnic relations; class relations and labor markets; social and revolutionary movements.

537-4 Seminar in the Sociology of Law. Following an introduction to the scope and content of the subject, emphasis will be given to theory and research on the nature of law, law as social control, law creation, and legal change.

539-4 Seminar in Complex Organizations. Overview of theories, research, and prevailing issues of complex organizations. These will include the power structure of the business community, emergence and structure of the bureaucrative organization, bases of authority, systems of formal and informal relations, unanticipated consequences of organizational structure, labor relations, total institutions, and social movements as organizations.

542-4 Seminar on the Family. Overview of the theoretical approaches, substantive issues, and techniques of research and measurement in the study of American family life. Approaches include structural-functionalism, conflict theory, and the feminist critique. Among the substantive topics are family roles and relationships, kinship, relationships of the family to other institutions, and family change.

543-4 Seminar on Comparative Family Systems. Analysis of cross-cultural and historical variation in family structure. Methods and sources of information for research on family structure.

551-4 Sociology of Religion. Theoretical and empirical study of the origin, location, and function of religious ideas and institutions in society.

562-4 Seminar in the Sociology of Deviance and Social Control. Critical analysis of sociological theories and methods used in the study of social deviance and control. Examination of social deviance such as suicide, mental illness, sexual variance, drug use, and alcoholism.

564-4 Seminar in Medical Sociology. Theoretical perspectives and empirical findings in the sociology of health, illness, and medicine. Analysis of such topics as social epidemiology, health care delivery and utilization, the sick role, and the drug industry.

572-4 Seminar in Criminology. Students will learn research methods appropriate to the student of crime within various theoretical schools of criminology. Particular attention will be paid to quantitative and qualitative approaches to symbolic interactionism, functionalism, social structural, ecological, and control theories.

591-1 to 4 Individual Research—Supervised Research Projects. Open to graduate students with a major in sociology. Graded *S/U* only. Prerequisite: consent of instructor and departmental director of graduate studies.

596-1 to 8 Readings in Sociology. Supervised readings in selected subjects. Graded *S/U* only. Prerequisite: consent of instructor and departmental director of graduate studies.

599-1 to 6 Thesis. Prerequisite: consent of chair.

600-1 to 32 (1 to 16 per semester) Dissertation. Prerequisite: consent of chair.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or

research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Special Education

400-3 Introduction to Special Education. An overview of characteristics of all types of exceptional children and youth including physical, mental, emotional, and social traits. The course also covers the effects of handicapping conditions in learning situations, and an overview of the history of special education including legislation and litigation.

401-3 Problems and Characteristics of the Behavior Disordered Children and Youth. Diagnosis, screening, classroom management, placement considerations, goals, and the effective use of ancillary services for the emotionally disturbed and/or socially maladjusted. Emphasis on the understanding of maladaptive behavior through principles of learning and behavior. Prerequisite: 400 or concurrent enrollment or consent of department chairperson.

402-3 Problems and Characteristics of the Mentally Retarded Child. Emphasizes a developmental approach to understanding and dealing with children who have mildly and moderately reduced mental abilities. Considers historical, theoretical, and practical factors pertinent to mental retardation. Prerequisite: 400 or concurrent enrollment or consent of department chairperson.

403-3 Problems and Characteristics of the Gifted Child. Designed to help teachers in the identification of and programming for gifted and talented children. Prerequisite: 400 or concurrent enrollment or consent of department chairperson.

404-3 Problems and Characteristics of Learning Disabled Children and Youth. Behavioral, emotional, physical, and learning characteristics of children and youth, with learning disabilities. Emphasis on receptive and expressive modalities for learning; theories dealing with causes and management. Prerequisite: 400 or concurrent enrollment or consent of department chairperson.

405-3 Education of the Preschool Handicapped Child. Emphasizes classroom procedures for enhancing development in children with developmental delay. Covers organization of the curriculum, goal setting, task analysis, lesson planning, and classroom organization. Practicum with preschool handicapped children is an integral part of this course. Prerequisite: 400, concurrent enrollment, or consent of chairperson.

406-3 Characteristics of Moderately and Severely Handicapped Learners. Presents historical, theoretical, and research developments in service delivery for severely handicapped individuals of all ages. Provides the basic developmental, instructional, and curricular background essential for prospective educators. Emphasizes a behavioral approach. Thirty hours of observation or equivalent applied experience is required.

408-3 Integrating Handicapped Children and Youth in Normalized Environments. For school personnel who serve directly and indirectly handicapped children and youth. The course focuses on providing the essential characteristic information and skills to appropriately educate the handicapped in a variety of settings.

409-1 to 6 Cross-Cultural Studies. Seminar and/or directed independent study concerned with socio-cultural variables affecting the personality characteristics and educational needs of children who are diagnosed as mentally, emotionally, or physically handicapped. Prerequisite: 400 or consent of instructor and department chairperson.

410-2 International Aspects of Services for the Handicapped. Focus on innovative ideas and practices in other countries in preschool programs, special education, rehabilitation, vocational training and employment, recreation, community living, organizational structures, and legislation.

411-3 Assessment in Special Education. Course covers general assessment information, intelligence and academic norm-referenced test, informal inventories, and adaptive behavior and rating scales. A laboratory fee is required to cover the cost of materials. Prerequisite: 400; one of 401, 402, or 404; or consent of department chairperson.

412-3 Assessment and Remedial Planning for the Preschool Handicapped Child. An introduction to the assessment of preschool handicapped children including the specifics of screening, tests used by the classroom teacher and observational procedures. A charge for testing materials is required. No textbook is required. Prerequisite: 400 or consent of instructor.

414-3 Assessment and Remedial Planning for Youth in Special Education. Testing, evaluation, and program development for adolescent students with special learning problems. Purchase of testing materials costing approximately $12 is required. Prerequisite: 400 and consent of department.

417-3 Methods and Materials for Teaching Behaviorally Disordered Children and Youth. Psychoeducational procedures used in teaching the behaviorally disordered children and youth. Includes field trips, meetings with parents, and visits by resource persons from schools and agencies. Prerequisite: 400, 401.

418-3 Teaching Educable Mentally Handicapped Children Elementary Level. Psychoeducational strategies used in teaching the educable mentally handicapped children and youth. Prerequisite: 400, 402.

419-3 Methods and Materials for Teaching Learning Disabled Children and Youth. Psychoeducational strategies used in teaching children and youth with learning disabilities. Prerequisite: 400, 404.

421-3 Methods and Materials for Teaching Moderately and Severely Handicapped Children. Emphasizes a behavioral approach (i.e., systematic instruction) in teaching young students with severe handicaps (e.g., moderate MR, severe MR, profound MR, multiple handicapped, autistic). Systematic instruction is discussed in relation to applications across various curriculum domains. Each student must have access to working with moderately or severely handicapped

students during the semester. All students are to develop and implement an instructional program during the course of the semester. Prerequisite: 400, 406.

423-2 General Procedures in Special Education. Presents key provisions of Public Law 94-142, including Individualized Education Programs (IEPS) and principles of behavior management common to the instruction of students with special needs. Prerequisites: 400; and one of 401, 402, 403, or 404; or consent of department chair.

425-2 Home-School Coordination in Special Education. Consideration of the techniques used in parent interviews, conferences, and referrals by school personnel with parents of handicapped children. Prerequisite: 400 or consent of department chairperson.

430-3 Secondary Programming for Mildly Handicapped Students. Deals with modifications of and additions to school programs to ensure that they are appropriate to the needs of the mildly handicapped adolescent. Includes detailed coverage of joint work-study programs as preparation for vocational adequacy, and addition of remedial and compensatory program models. Prerequisite: 400 and one of 401, 402, 403, or 404.

431-2 Work-Study Programs for Severely Handicapped Adolescents to Age 21. Deals with program offerings in public school special education programs designed to prepare the severely handicapped adolescent for maximum vocational adequacy. Prerequisite: 400 and one of 401, 402, 404, or 406.

500-3 Special Education Research Problems. Research design and methodology in special education. Prerequisite: consent of instructor.

501-3 Methods and Materials for Seriously Behavior Disordered. Deals with methods, materials, and instructional management practices common to the instruction and management of seriously behavior disordered students in the schools and in residential settings.

503-3 Educational Program Delivery for Gifted and Talented Students. Planning implementation and evaluation of differential educational programs for gifted and talented students. Reviews historical through modern day approaches to the systematic delivery of educational services to exceptional populations. Evaluation methods for the expansion and refinement of gifted programming are planned. Prerequisite: 403.

505-3 The Pre-School Handicapped Child. Deals with the philosophy and practices involved in the development and maintenance of educational programs for pre-school age handicapped children in the community.

511A-3 Advanced Assessment and Remedial Planning in Special Education. Administration and interpretation of typical instruments used to gain information to be used in remedial planning for children in special education programs. Designed to provide students with thorough knowledge of testing procedures, this course will include supervised practicum in testing and development of remedial programs. Prerequisite: 411.

511B-3 Advanced Remediation in Special Education. Designed to provide the graduate student with experience in designing and carrying through with a remedial program. Prerequisite: 511A.

512-3 Advanced Assessment and Remedial Planning for the Preschool Handicapped Child. Advanced diagnostics with preschool handicapped children. A clinic based practicum experience in the evaluation of preschool handicapped children. Prerequisite: 412, 405, or concurrent enrollment, and consent of instructor and chair.

513-3 Organization, Administration, and Supervision in Special Education. Emphasis upon the functions, underlying principles, and cautions to be observed in the organization and administration of special education. The selecting and training of teachers, problems of supervision, special equipment, transportation, cooperating agencies, and legal aspects of the problem. Prerequisite: 400 and consent.

514-3 Simulation of Administrative Tasks in Special Education. Development of skills required of special education administrators and supervisors through the use of simulation materials focusing on these skills. Prerequisite: 400 and consent.

515-2 Itinerant and Resource Teaching in Special Education. The role, responsibilities, problems of the itinerant and resource teacher in special education. Alternate systems and models for providing educational experiences for handicapped children. Review of the role and responsibilities of other ancillary school personnel. Prerequisite: consent of instructor.

516-3 Advanced Assessment for Educationally Handicapped Youth in Special Education. Administration and interpretation of typical instruments used to gain information to be used in program planning for adolescents in special education programs. Designed to provide potential secondary teachers with thorough knowledge of testing procedures, this course will include supervised practicum in testing and development of remedial programs. Prerequisite: 411.

517-2 The Atypical Child and Social Agencies. A survey of social agencies contributing to the welfare and care of exceptional children. Emphasis is given to services rendered and to method of contact and costs. Specialists invited to appear before the class. Prerequisite: 400 and consent.

518-1 to 6 Workshop in Special Education. Topical workshops centered on current practices and new developments in special education. Designed to promote better understanding of the psychological and educational problems of exceptional children. Open to graduate students majoring in education and related fields. Prerequisite: 400 and consent of instructor and department chair.

519-3 Career Development Opportunities for Educationally Handicapped Youth. This course is designed to prepare special educators to understand the career needs of the educationally handicapped youth and the procedures for developing appropriate career services for such students. Prerequisite: 430.

523-3 Technology Usage in Special Education. The application of evolving technologies will be related to circumventing, accommodating, and compensating for handicapping conditions. Particular attention will be devoted to microcom-

puter applications with an emphasis on classroom usage. Prerequisite: C&I 483 or consent of instructor.

550-3 Behavior Management of Exceptional Children and Youth. Describes assessment, implementation, and monitoring procedures involved with the use of behavior change techniques in special education programming. Emphasis will be placed on the actual implementation of behavior change techniques with handicapped school aged students in public school settings. Prerequisite: concurrent enrollment in 594 and REHB 406 or consent of instructor.

560-2 Inservice Delivery. Covers theoretical and practical aspects of inservice delivery/staff development. Special focus on organizing inservice programs, delivery techniques, consultative skills development, select inservice models, needs assessment, and evaluative techniques. Prerequisite: C&I 483 or consent of instructor.

576-3 Correctional Education Programming. Covers overview of organization structures in correctional settings; structure of educational programs, types of educational programs, characteristics of juvenile and adult students, educational assessment and placement procedures. Prerequisite: consent of instructor.

578-3 Legal Framework for Special Education Services. Covers PL 94-142 (Education for all Handicapped Children Act) and Section 504: The Rehabilitation Act of 1973. Emphasis on both pieces of legislation with respect to provision of educational services for handicapped children and youth/young adults. Prerequisite: 400, or concurrent enrollment, or consent of instructor.

580-3 Master's Seminar: Issues and Trends in Special Education. Analysis of research, trends, and programs in the education of handicapped children. Open to graduate students in special education only. Prerequisite: 400, consent of instructor and department chair.

582-3 Post-Master's Seminar: Theories and Models in Special Education. Critical discussion of eight major intervention models used historically and currently with handicapped children in educational settings. Prerequisite: consent of instructor.

583-3 Post-Master's Seminar: Program Coordination in Special Education. Analysis of organizational principles and practices required for the creation and maintenance of programs to meet the needs of persons who are handicapped and require specialized educational programs within the school setting. Prerequisite: consent of instructor.

584-3 Doctoral Seminar: Research in Special Education. An analysis of purposes, approaches, design, methodology, and applications of experimental studies of handicapping conditions, as they relate to special education. Prerequisite: 582, 583.

585-3 Doctoral Seminar: Evaluation in Special Education. An analysis of the purposes, approaches, design, methodology, and applications of evaluative studies in special education. Prerequisite: 582, 583.

586-1 to 4 (1,1,1,1) Proseminar in Special Education. A topical seminar providing for the systematic discussion of current research in the field of special education. Specific content is determined by participating faculty and students, relative to current faculty research and dissertations in progress within the department. Doctoral students will register for a total of four credit hours, one per semester, after which they will audit the course during the pursuit of their dissertation. Master's students admitted with consent of adviser and chair.

590-1 to 6 Readings in Special Education. Study of a highly specific problem area in the education of exceptional children. Open only to graduate students. Graded *S/U* only. Prerequisite: 400, consent of instructor.

591-1 to 6 Independent Investigation. A field study for graduate students. Conducted in a school system where full cooperation is extended. The study will involve selection of a problem, surveying pertinent literature, development of experimental design and procedures, recording results, and appropriate interpretations and summaries. Prerequisite: consent of instructor.

594-1 to 6 Practicum in Special Education. Supervised experience in school or institutional programs for atypical children. Special research project. Open to graduate students only. Prerequisite: consent of instructor and department chair.

595-1 to 12 (1 to 6) Internship. The doctoral internship is a required experience. Internship hours do not apply to minimum needed for graduation. Each student shall engage in specialized service areas within a school system, university, state office, federal office, or private agency. Internship assignments include: **(a)** research and applied studies; **(b)** evaluation; **(c)** administration; **(d)** university teaching; **(e)** program planning and management; **(f)** supervision; and **(g)** specialized delivery systems. Interns will participate in regularly scheduled on-campus or on-site seminars with the university and field internship supervisors.

599-1 to 6 Thesis. Independent hours to be taken under the supervision of the student's master's degree chair for the purpose of conducting and writing the master's thesis. Prerequisite: consent of instructor.

600-1 to 32 (1 to 12 per semester) Dissertation. Prerequisite: consent of chair.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Speech Communication

401-3 Communication Theories and Models. An introduction to theory construction and model utilization in communication research. Critical analysis of existing communication theories in the social sciences as a basis for generating new models. Emphasis on the heuristic nature and

function of the language/speech act paradigm in communication studies.

411-3 Rhetorical Criticism. Designed to develop the student's ability to criticize public discourse, including speeches, written works, and the mass media.

421-3 to 9 (3, 3, 3) Studies in Public Address. Critical studies of speakers and issues relevant to social and political movements dominants in national and international affairs. A lecture, reading, and discussion course. Students may repeat enrollment to a total of nine hours. Prerequisite: for undergraduates, 411 or consent of instructor.

430-3 Speech in Elementary Schools. Survey of normal speech development with emphasis on the elementary school years. Concept of speech as skill basic to reading, writing, and spelling. Psychological and sociological variables affecting language as it relates to school learning. Speech experiences supportive of the child's linguistic, intellectual, and social development.

431-3 Speech in Secondary School. Philosophy of speech education, and effective teaching of speech through curricular and extra-curricular work. Prerequisite: twelve hours of speech and consent of instructor.

432-3 Secondary School Forensic Program. Designed to evaluate and plan the proper role of forensics in the secondary school and to prepare the students for their tasks as teachers and administrators in that program. Students enrolled as majors in speech communication with a specialization in communication education must complete this course before enrolling for student teaching. Not for graduate credit. Prerequisite: 325, GEC 200.

433-3 Children's Literature in Performance. Study of children's fiction and poetry through analysis, creative drama, and performance, including solo and group work.

435-3 to 6 (3, 3) Topics in Creative Drama. An exploration of advanced theories and techniques for conducting sessions in informal drama. Topics vary and are announced in advance. Students may repeat enrollment in the course, since the topics change. Lecture, discussion, class projects, school visitations.

440-3 Language Behavior. Study of linguistic approaches to speech communication based on behavioral determinants such as culture, history, speech community, value orientations, social perception and expression, and the nature and function of interpersonal transaction. Prerequisite: 340 or consent of instructor.

441-3 Intercultural Communication. Application of semiotic and cultural theories to language behavior. Emphasis on speech communication as an approach to the study of intercultural communication. Prerequisite: 341 or consent of instructor.

442-3 Psychology of Human Communication. Nature, development, and functions of verbal and nonverbal behavior; application of psychology theories and research to the communication process in individuals and groups. Emphasis on the systemic nature of communicative behavior.

443-3 General Semantics. Formulations from the works of Alfred Korzybski and from neo-Korzybskian interpreters are presented. General semantics is discussed as an interdisciplinary approach to knowledge. Relationships are made to contemporary problems in human affairs.

444-3 Studies in Language Acquisition. Research in and theories of the development of verbal and nonverbal language with attention to the maturational process. Includes investigation of social, phonological, syntactical, and semantic correlates of communication development. Appropriate for advanced students interested in working with or conducting research involving children.

445-3 Conversational Performance. Analysis of performance acts within everyday interaction: stories, jokes, laughter, teasing, etc. Application of theories of play, metacommunication and framing. Re-performance of recorded, transcribed conversations as method of exploring aesthetic dimensions of communication. Prerequisite: nine hours of SPCM courses or consent of instructor.

446-3 Sociology of Language Discourse and Signs. Introduction to sociological semiotics, especially structuralism and post-structuralism. Reference to French theorists such as Barthes, Baudrillard, Bourdieu, Certeau, Deleuze and Guattari, Greimas, Group Mu, Lacan, Lyotard, and Perelman. Emphasis on the practice of discourse, language, and signs as a model for research in the human science of communicology.

447-3 Semiotic. (Same as Philosophy 422.) Introduction to Semiotic as the general theory of signs, including natural signs, signals and linguistic expressions. Concentration on contrasts and comparisons between language and more primitive types of signs.

451-3 Political Communication. (Same as Political Science 418.) A critical review of theory and research which relate to the influence of communication variables on political values, attitudes, and behavior. Prerequisite: 358 or consent of instructor.

452-3 Interpersonal Communication and the Mass Media. A review, synthesis, and analysis of communication theory and research which deals with the process, interactive nature of interpersonal, and mass channels of communication. Prerequisite: 401 or consent of instructor.

460-3 Small Group Communication: Theory and Research. A critical examination of small group theory and research in speech communication. Emphasis is given to the development of principles of effective communication and decision-making in the small, task-oriented groups. Prerequisite: 261 or consent of instructor.

461-3 Laboratory in Interpersonal Communication I. Interpersonal communication is studied as human encounter. The philosophy and theoretical bases of existential phenomenological approaches to human communication are discussed. Projects are evolved by small groups that contribute to the understanding of human communication.

462-3 Laboratory in Interpersonal Communications II. Various theories of social and cultural change are explored. The role of interpersonal communication in the development of human consciousness is explicated. Projects are evolved by small groups that examine values and priorities of human nature and cultural nature.

465-3 Philosophy of Language. (See Philosophy 425.)

471-3 Prose Fiction in Performance. Study of prose fiction through analysis and individual performance. Prerequisite: 370 or consent of instructor.

472-3 Poetry in Performance. The study of poetic form through analysis and performance. Prerequisite: 370, GEC 200 or consent of instructor.

474-3 Staging Literature. Theory and practice of staging literature in the lyric mode with emphasis on adapting and directing. Prerequisite: 370 or consent of instructor.

475-3 Narrative Theatre. Theory and practice of staging narrative literature with emphasis on adapting and directing. Prerequisite: 471 or 474 or consent of instructor.

476-3 Writing as Performance. An examination of the practical and theoretical links between composition and performance. Lectures, reading, and assignments focus on performance as a means and an end to creative writing.

480-3 Dynamics of Organizational Communication. Introduction to interrelationships of communicative behavioral and attitudes with organizational policies, structures, outcomes. Uses case studies and role-plays to teach principles. Individual research into selected aspects of organizational communication. Prerequisite: 280, 442, or consent of instructor.

481-3 Public Relations Cases and Campaigns. Advanced course in public relations case analysis and campaign planning. Students critique public relations campaigns created by various profit, nonprofit, and agency organizations. Students also design public relations campaigns from problem identification through evaluation stages. Prerequisite: 381 and 382 with a grade of *C* or better.

483-3 Studies in Organizational Communication. Study of communication systems and behaviors within organizations. Consideration of relevance of communication to management operations, employee morale, networks, superior-subordinate relations, production, and organizational climates. Individual research into selected aspects of organizational communication. Prerequisite: 480 or consent of instructor.

490-1 to 6 Communication Practicum. A supervised experience using communication skills. Emphasis on the development of performance skills in the following areas: **(a)** Communication studies. **(b)** Performance activity. **(c)** Interpersonal communication. **(d)** Debate and forensic activity. **(e)** Political communication. **(f)** Organizational communication. **(g)** Instructional communication. May be repeated for credit. Undergraduates limited to a total of six hours and graduate students to three to be counted toward degree requirements.

492-2 to 8 Workshop in Performance Studies. Summer offering concentrating in specialized areas of performance studies. Prerequisite: 370 and GED 200 or consent of instructor.

493-3 to 9 (3, 3, 3) Special Topics in Communication. An exploration of selected current topics in communication arts and studies. Topics vary and are announced in advance; both students and faculty suggest ideas. Students may repeat enrollment in the course, as the topic varies.

501-3 Introduction to Speech Communication Research. Survey of research methods utilized in the discipline of speech communication. Discussion of these methods as they apply to the various subject matter typologies. Introduction to basic conventions of research investigation and reporting.

502-3 Seminar: Quantitative Communication Research. Review and analysis of types of quantitative research and methods of data collection most relevant to the study of human communication. Prerequisite: 501 and EPSY 506 or an equivalent course.

503-3 Communicology as a Human Science. Introduction to the human science approach (phenomenology) to theory construction in human communication. Examination of the modality conditions for evidence (actuality, possibility, necessity, sufficiency) and the corresponding logics (assertic, problematic, apodeictic, thematic) for qualitative research. Focus on the Abduction models of human communication and practice used by theorists such as Gregory Bateson, Paul Waltzlawick, Roman Jakobson, Charles S. Pierce, Maurice Merleau-Ponty, and Michel Foucault.

504-3 Seminar: Empirical Phenomenological Communication Research. Review and analysis of the types of empirical phenomenological research and methods of capta/data collection relevant to the study of human communication. Prerequisite: 501 and 503.

505-3 Seminar: Semiotic Phenomenology and Critical-Cultural Research. Review, analysis, and application of eidetic and hermeneutic models for conducting interpretive research in the tradition of semiology and phenomenology. Focus on those qualitative approaches which use a critical-cultural context of investigation in the human sciences, especially communicology. Prerequisite: 503 and 504 or consent of instructor.

510-3 to 6 (3,3) Seminar: Rhetoric and Communication. An analysis of selected theories of communication, public address, and rhetoric. Emphasis on major contributors of historical or contemporary importance. Students may repeat enrollment to a total of six hours.

526-3 Seminar: Studies in Persuasion. The study of persuasion in social-political contexts. Exploration of contemporary research and selected theories in persuasion. Examination of philosophical-ethical questions related to persuasion. Readings, research, and discussions.

531-3 Seminar: Speech Education. Advanced study of selected problems in speech communication instruction. Analysis of research problems and methodologies in speech pedagogy research. Topics may vary from year to year. Prerequisite: consent of instructor.

539-3 Speech Communication at University Level. Analysis and practice of instructional methods. Focus on the development of instructional skills with specific applications to teaching the basic college speech communication course.

540-3 Seminar: Language, Culture, and Semiology. Examination of communication problems and research focusing on the relation among cultural values, communication behaviors in the speech community, and social exchange. Emphasis on the semantics and pragmatics of intercultural communication and social semiotic

systems. Prerequisite: 440 or 441 or consent of instructor.

545-3 Seminar: Semiology and Semiotic Communication. Advanced study of sign, signal, and symbol systems in the phenomenology of communication. Systematic analysis of the metatheory relationship between expression and perception as manifest in verbal and nonverbal communication systems. Emphasis on semiology as a communication theory in the human sciences. Some consideration of related theories such as structuralism, interspecies communication, human/machine communication, and general systems theory. Prerequisite: 440 or 441 or consent of instructor.

546-3 Conversation Analysis. (Same as Linguistics 546.) Study of the pragmatics of everyday conversation: sequential organization, topical coherence, speech act rules and functions, contextual frames, and background understandings. Emphasis on observational research methods and analysis of original data. Prerequisite: consent of instructor.

551-3 Phenomenology Seminar I: French Communicology. A critical examination of dominant problematics, thematics, and rhetorics in communication theory and praxis developed as a human science (*science humaine de communicologie*) by such contemporary French theorists as Barthes, Bourdieu, Foucault, Merleau-Ponty, Perelman, and Ricoeur. Prerequisite: 401 and 461 or consent of instructor.

552-3 Phenomenology Seminar II: German Communicology. A critical examination of dominant problematics, thematics, and rhetorics in communication theory and praxis developed as a human science (*Kommunikationsgemeinschaft*) by such contemporary German theorists as Apel, Jaspers, Habermas, Heidegger, Luckmann, and Luhmann. Prerequisite: 401 and 461 or consent of instructor.

561-3 to 6 (3,3) Studies in Small Group Communication. Studies of group action, interaction, and leadership designed to apply small group theory and communication theory. Emphasis on the nature of group communication as exemplified in the laboratory model or the discussion/conference model. Students may repeat enrollment to a total of six hours.

562-3 Philosophy of Human Communication. (Same as Philosophy 562.) Advanced study of the philosophical theories and models utilized in the human sciences to analyze, describe, and interpret communication as a paradigm of expression and perception. Emphasis on the nature of persons, consciousness, and social exchange as discussed by such contemporary schools of thought as existential phenomenology, semiology, behaviorism, structuralism, critical theory, hermeneutics, and conceptual analysis. Prerequisite: 461 or 462, or PHIL 482 or 425 (same as SPCH 465), or consent of instructor.

563-3 Studies in Interpersonal Communication. An investigation of recent theories and empirical research concerning interpersonal communication. Emphasis will be placed on analyses of relational development, maintenance, and change in the contexts of working relations, friendships, and families. Both analytic and quantitative perspectives on interactional processes will be considered.

570-3 Performance Methodologies. The examination of performance methodologies for exploring human communication. Particular attention is given to generating and reporting performance knowledge. Prerequisite: nine hours of 400 level performance studies courses or consent of instructor.

571-3 Theory and Criticism in Interpretation: Pre-Twentieth Century. A study of the philosophical and critical trends in oral interpretation theory with emphasis on their historical development. Prerequisite: nine hours of interpretation or consent of instructor.

572-3 Theory and Criticism in Interpretation: Twentieth Century. A study of the philosophical and critical trends in oral interpretation theory in the twentieth century. Prerequisite: nine hours of interpretation or consent of instructor.

573-3 Performance Criticism. An examination of the theoretical and practical issues surrounding the evaluation of artistic performances for interpretation, rhetoric, theatre, journalism, film, and television students interested in developing their critical skills. Prerequisite: consent of instructor.

574-3 to 6 (3,3) Studies in Interpretation. An exploration of selected current topics in the field of oral interpretation. May be repeated for a total of six hours. Prerequisite: twelve hours of interpretation or consent of instructor.

580-3 to 9 Issues in Organizational Communication and Public Relations. Advanced study and applications related to specific issues in **(a)** organizational communication, **(b)** public relations, and **(c)** political communication. May be repeated with change of topic area. Topics announced prior to each offering.

593-1 to 3 Research Problems in Communication. Independent research study with a theoretical focus under the tutorial supervision of a member of the graduate faculty. Prerequisite: consent of instructor and departmental adviser.

595-1 to 3 Research Report. One to three hours required of all non-thesis students writing a research paper. Graded *S/U* or *DEF* only.

598-0 Proseminar in Human Communication. An open forum offered each semester for the systematic discussion of contemporary research in the field of communication arts and studies. Specific content is determined by participating faculty and students. Topics will usually be related to current faculty research or dissertations in progress in the department. Graded *S/U* only.

599-1 to 6 Thesis. Minimum of three hours to be counted toward a master's degree.

600-1 to 36 (1 to 12 per semester) Dissertation. Minimum of 24 hours to be earned for the Doctor of Philosophy degree.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concur-

rent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Statistics

(See Mathematics.)

Telecommunications

(See Radio-Television.)

Theater

400-1 to 6 (1 to 2 per semester) Production. Practicum for support of major department productions in all areas. Roles in department productions may fulfill requirement.

402-6 (3, 3) Play Directing. (a) Introduction to directing. The history of the director; the evolution of the director into a position of predominance in modern theater hierarchy. The function of the director; and examination of theoretical viewpoint. Textual analysis; establishing the groundwork for the director's approach to production. Prerequisite: junior standing; 217 and 311a; or consent of instructor. **(b)** The principles of play direction including play selection, analysis and patterning of auditory and visual elements of production. Directing of a one-act play. Prerequisite: consent of instructor.

403-3 Advanced Voice and Movement. Advanced studies in voice and movement with special attention to period styles, commedia dell'arte, and period dance for the stage. Prerequisite: 303.

404-3 Theater Management. Discussion of legal and financial aspects concerning the professional and community theaters of the United States. Consideration of and practice in managerial activities of an educational theater including administration, purchasing, and accounting practices, direct sales, publicity, promotion, and public relations.

406-3 Properties and Crafts for the Stage. Studio work in traditional and non-traditional crafts for theatrical events, including life masks, upholstry, puppetry, stage furniture, and special effects.

407-3 Scene Design. Technical and artistic aspects of scene design. Theory and practice. Supplies at least $25 per semester. Prerequisite: 218a, 309, 409, or consent of department.

408-3 Model Making. The craft of scenic model making for the stage and other dramatic media. Prerequisite: 218a or consent of department.

409a-3 Scene Painting. Studio work in lining, paneling, tromp l'oeil ornament, and drapery. Prerequisite: 218a or consent of department.

409b-3 Advanced Scene Painting. Advanced studio work in scene painting, including dye painting, transparencies, color mixing, and mural work.

410-3 Children's Theater. Study of methods and their practical application of introducing children to theater and theatrical productions as an art form. Includes the writing of a short play for children. Recommended for majors in education programs.

411A-3 Playwriting — The One-Act Play. Principles of dramatic construction and practice in the writing of two one-act plays. Problems of adaptation are treated. Individual plays have the opportunity to be produced in the theater's program for new plays. Prerequisite: one course in dramatic literature for non-majors and graduates; 311a for undergraduate theater and speech communication majors; or consent of instructor.

411B-3 Playwriting — The Full-Length Play. Principles of dramatic construction and practice in the writing of a full-length play, encompassing such varied types as the children's play, the musical, the outdoor historical drama, etc. In special cases, students may elect to write three short plays. Prerequisite: 411A or consent of instructor for non-majors; 311a for undergraduate theater majors.

414-3 Costume Design. History of western costume from Greek to Renaissance and its adaptation to stage use. Theory and practical application of design and color. Supplies at least $25. Prerequisite: 218c, 311a, 354a,b; or graduate standing.

417-3 Advanced Acting. Utilization of the actor's process in the performance of European realism and various theories and styles of the twentieth century. Prerequisite: 317b.

418-3 Advanced Stage Lighting. Investigation of stage lighting design, theory, and professional practice. Special attention to color theory and its application to stage lighting. Four hours lecture/laboratory. Prerequisite: 218b, graduate standing, or consent of instructor.

419-3 Advanced Stagecraft. Advanced study of principles and procedures of scenic construction and stage rigging. Includes scene shop organization, materials, and specialized stage equipment; preparation for professional technical direction. Lecture and laboratory to be arranged. Prerequisite: 218a,b, 309, 407; or graduate standing.

454-3 American Theater. The development of American theater from colonial times to the present. Includes a study of the American musical theater from preminstrels through contemporary music-drama.

489-3 to 6 Theater-Television Workshop. Advanced work in the producing, acting, and writing of original television drama. Prerequisite: *C* grade in Radio-Television 300M, 300P and consent of instructor for radio-television majors; consent of instructor for theater and other majors.

500-2 Introduction to Research Methods. An introduction to the principles and methods of the various types of research in theater. The student may elect to focus on the research demands of a selected area of interest within the degree program pursued. One objective is the formulation of a research problem and a prospectus. Prerequisite: graduate standing.

501-3 Contemporary Developments. A survey of the significant developments in theater and related arts from the beginning of the 19th century to the present through the study of documentary material, critical works, and selected plays. Individual reports, guest lecturers, and lectures pro-

vide focus on selected areas. Required reading encompasses a broad spectrum of subjects. Prerequisite: graduate standing.

502-3 Advanced Directing. Emphasis on practical directing problems and concerns of individual students through research, rehearsal, and performance. Includes survey of directing theories and practices with laboratory application of directing techniques. Prerequisite: consent of instructor.

503-4 (2,2) Graduate Theater Speech Studies. **(a)** Work in American and foreign dialects. Includes representative readings from plays. Prerequisite: 403b. **(b)** Synthesis of vocal techniques through work on individual problems. Prerequisite: 503a.

504-3 The Comic Theater. A study of comedic drama, theory, and criticism as applied to types of comedy with a focus on interpretation for the theater practitioner. Individual reports are assigned.

505-3 The Tragic Theater. An examination of tragic drama and criticism as related to the societies which produced such drama. Individual reports are assigned.

507-3 Advanced Scene Design. Advanced consideration of principles of scene design. Scenography as a dynamic force in theater and related media worldwide. Supplies at least $25 per semester. Prerequisite: 407 or consent of instructor.

510-2 to 8 Production Design Seminar. Exploratory workshop experience in innovative contemporary rendering techniques and methods for translation of metaphorical into theatrical visuals values, with emphasis on design sophistication. To include, among other topics, theatrical rendering presentation, sketching, and color and texture experimentation. Comprehensive development of portfolio projects. To be taken by graduate production design students each semester in residence.

511-3 to 6 Playwriting Workshop. A practical laboratory course in which playwriting students will have one or more original plays presented in staged readings or modified productions. Plays will be directed and, in part, acted by graduate acting/directing students also enrolled in the course. The workshop gathers a performance group for the presentation of the new plays. Student playwrights are expected to constantly improve their work before and after presentation, to attend rehearsals, to work closely with directors and actors. Plays will be evaluated in critique sessions. Restricted to graduate playwriting and acting/directing students in the theater program. Prerequisite: graduate standing; theater major; 411a and b or consent of instructor.

513-4 (2,2) Stage Movement for Graduate Actors. **(a)** Practical work in stylized movement. **(b)** Continued work on the actor's physical instrument. Must be taken in a,b sequence. Prerequisite: 413b.

514-3 Advanced Costume Design. Advanced consideration of principles of costume design. Theory and history of costumes from Renaissance through early 20th century. Practical applications of methods and procedures in designing costumes. Supplies at least $25 per semester. Prerequisite: 414 or consent of instructor.

517-6 (3,3) Graduate Acting Studio. **(a)** Advanced work on scenes from the classics. Prerequisite: 417b and consent of instructor. **(b)** Advanced work on scenes from contemporary drama and musical theater. Prerequisite: audition and consent of instructor.

522-1 to 12 SIU Summer Theater. Practical experience in summer stock play production. Performance or technical work in SIU Summer Theater only. Maximum of six hours per summer. Prerequisite: audition and consent of instructor.

526-3 to 12 (3 per topic) Seminar in Theater Arts. Special topics of interest to advanced students. Subject is determined by department and instructor. Areas: **(a)** Performance/production. **(b)** Theory, criticism, and playwriting. Seminar in same area may be taken twice. Prerequisite: consent of instructor.

530-1 to 12 Independent Study. Independent research on selected problems. A maximum of three credit hours may be taken for a single project. Prerequisite: consent of instructor.

550-2 to 6 (2 per topic) Topical Seminar. In-depth studies of topics of special interest to advanced students concerning individual or groups of playwrights, directors, designers, and their techniques and theories. Topic is determined in advance. Prerequisite: consent of instructor.

560-1 to 21 Professional Work Experience. Credit may be granted for professional work experience prior to acceptance into the program. Prerequisite: approval by departmental graduate committee required. Graded *S/U* only.

561-1 to 12 Theater Internship. After completion of the M.F.A. core curriculum and basic courses in student's specialization, credit may be granted for internship at professional theatres, training programs, or studios. Prerequisite: prior approval of departmental graduate committee required. Graded *S/U* only.

599-1 to 6 Thesis. Minimum of three hours to be counted toward a master's degree.

600-1 to 36 (1 to 16 per semester) Dissertation. Minimum of 24 hours to be earned for the Doctor of Philosophy degree.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Vocational Education Studies

402-3 Introduction to Office Information Systems. An introduction to the integrated office concept investigating the functions of data processing, records management, electronic mail, word processing, and reprographics.

404-3 Analysis of Office Systems. An investigation of procedures and systems used in various types of offices, including a study of work flow, the processing of words, office personnel and their responsibilities, and the role of office functions in the total business society. Prerequisite: 402.

405-3 Office Management. Principles of management applied to office problems. Emphasis on the role of the office in business management; office organization; physical facilities and layout of office; office services, procedures, standards, and controls; records management.

407-3 Records Administration. An introduction to methods and systems of controlling, storing, retrieving, and disposing of records. Application of principles of records administration to medical, legal, educational, industrial, and governmental records. Techniques needed to design and implement an operationally efficient records management program.

408-3 Information Administration Technologies. An investigation of the various technologies and their use to efficiently control, store, retrieve, and communicate information. Methods and techniques needed to design and implement various technological information systems will be explored as they apply to the development of information management programs. Prerequisite: 407.

409-3 Applications of Integrated Software/Education. (Same as Agricultural Education and Mechanization 418.) Design of agricultural or educational applications of integrated software. Spreadsheet, database, wordprocessing, and graphic and communications software will be applied to the solution of business problems. Individual student projects will be the focus of the applied nature of the class. Prerequisite: junior standing or consent of instructor.

410-2 Principles and Problems of Business Education. A study of the fundamentals of business education; its relation to business, to general education, and to vocational and career education; its history, current status, and trends; special emphasis on objectives and curriculum problems.

415-7 (1 per topic) Instructional Methods for Business Education. Specific methods, techniques, and materials to deliver instruction in these business education areas: **(a)** accounting, **(b)** business and marketing, **(c)** computer systems, **(d)** keyboarding, **(e)** information processing, **(f)** shorthand, **(g)** employability skills. Prerequisite: 310, 462 or Education 315.

428-3 Home Economics for Elementary Teachers. Identification and development of meaningful home economics related experiences appropriate for various levels of elementary curriculum. Interpretation of current vocational education legislation and trends affecting elementary programs.

431-3 Demonstration and Laboratory Techniques in Home Economics Education. Practice in planning and carrying out instructional demonstrations in home economics for youth and adults. Use of audiovisual aids and hand-outs. Procedures for laboratory and guided practice to develop psychomotor skills. Attention given to TV presentations. Possible expense for materials to use in classroom demonstrations $5 to $8.

439-3 Historic Clothing: Western Cultures. Development of clothing in western civilization to the present time. Consideration of social, economic, and aesthetic factors, and technical innovations influencing clothing. Prerequisite: 347 or equivalent.

440-3 Experimental Custom Apparel Designing. Development of apparel to meet aesthetic, structural, and functional needs; problem solving for exceptional proportions, rehabilitation, activity, performing arts, new technology, materials, environment. Prerequisite: 342, 344.

442-3 Clothing Economics. Factors of production, distribution, and consumption influencing clothing industry; management of these factors in clothing related businesses; place of clothing industry in national and international markets. Field trip. Prerequisite: GEB 211 or Economics 214.

444-3 Mass-Market Apparel Designing. Design of a line to specifications; drafting; toiles, mass-production costs; work flow; use of industrial equipment. Field trips. Prerequisite: 342 and 344.

445-3 Textile Product Testing. Exposure to and experience with methods used by retailers and manufacturers of textile items to measure performance and maintain quality. Standards, sampling, and replication requirements and interpretation of results. Prerequisite: 345 or equivalent.

449-3 Historic Clothing: Non-Western Cultures. Traditional dress in non-western cultures. Aesthetics, symbolism, and uses of costume in the culture; effect of clothing on economy. Cultures studied may vary with each offering. Offered alternate years. Prerequisite: junior standing.

450-3 Introduction to Health Occupations Education. An orientation course for health occupations education. Provides information on the current and historical directions in health occupations education, resources for teaching and training of prospective students; program articulation and career mobility; the role of professional and student health organizations; state and federal legislation/regulations in health occupations education; licensure and certification requirements and their impact on education; and health occupations career clustering within Illinois' vocational system. Prerequisite: 460 and 462.

460-3 Occupational Analysis and Curriculum Development. The first of a two-course sequence presenting a systems approach to curriculum development and instructional methods utilized in vocational and occupational education. Includes analyzing occupations and jobs, specifying objectives, and developing curriculum. (**a**) Agricultural education, (**b**) business education, (**d**) education, training and development, (**e**) health occupations education, (**f**) home economics education, (**g**) industrial education.

462-3 Teaching Methods and Materials. The second of a two-course sequence presenting a systems approach to curriculum development and instructional methods utilized in vocational and occupational education. Concerned with instructional methods and materials unique to vocational and occupational education. (**a**) Agricultural education, (**b**) business education, (**d**) education, training and development, (**e**) health occupations education, (**f**) home economics education, (**g**) industrial education.

463-3 Assessing Vocational Student Progress. Development and use of evaluation instruments to assess occupational student growth. Use of systems approach to course design,

criterion-referenced and norm-referenced objectives, and four taxonomies of educational objectives in development of written tests, laboratory and work station performance tests, and attitude measures. Data are used for evaluation of student progress and program modification. Prerequisite: 460.

464-3 Special Needs Learners and Work Education. Theoretical and applied concepts in teaching special needs learners. Affective aspects of learning are emphasized. Curricula and teaching materials are examined and prepared. Field trips.

466-3 Principles and Philosophies of Vocational Education. Historical and philosophical foundations of vocational education. The nature and role of vocational education in preparing people for the world of work.

468-3 Education/Labor Force Linkages. Examines education/labor linkages. Particular attention given to the following areas: overcoming barriers to the linkage process; developing effective lines of communication; resource sharing; conducting joint problem solving with other agencies and individuals within the community; and jointly developing and providing programs and services.

469-3 Training Systems Management. Principles and techniques of managing training organizations. Design, promotion, conduct, and evaluation of training programs in accordance with needs, restraints, and resources in corporate and government settings. Prerequisite: 460 and 462.

472-3 Organizing Cooperative Vocational Education. Introduction to cooperative vocational education including history, rationale, legislative basis, and goals and objectives. Investigation into the competencies required for developing programs, public relations, and evaluation of cooperative vocational education. Introduction of student selection and management of cooperative vocational education. Fulfills three semester hours of six required for State of Illinois certification.

473-3 Coordinating Cooperative Vocational Education. Overview of cooperative vocational education. Investigation into the competencies required for the establishment, implementation, and coordination of cooperative vocational education to include selection and maintenance of training stations, student placement, related instruction in cooperative vocational education, and the management of cooperative vocational education programs. Fulfills the remaining three semester hours of the six required for State of Illinois certification. Prerequisite: 472.

474-3 Individualized Vocational Instruction. Study of the theory, characteristics, appropriateness, and evaluation techniques of individualized programs. Will include a review of the current state of individualized instruction in education for work programs.

478-3 Contemporary Principles in Management of Technical Education Programs. Study of contemporary approaches to the teaching of technical education including: developing an understanding of the philosophical base; identifying a curriculum development procedure in teaching strategies; and, locating resources and educational aides for teaching technologies related to communication, energy utilization, production and transportation.

484-3 Adult Vocational and Technical Education. A study of adult vocational and technical education as offered in a variety of educational settings. Major topics include organization, funding, teaching, student characteristics, and evaluation. Prerequisite: consent of adviser.

488-3 Initiating Vocational Student Placement and Follow-Up. Planning, implementing, operating, and evaluating school-based placement systems for vocational education.

490-1 to 4 Readings. Supervised reading for qualified students. May include independent study. (**a**) Agricultural education, (**b**) business education, (**c**) clothing and textiles, (**d**) education, training and development, (**e**) health occupations education, (**f**) home economics education, (**g**) industrial education, (**h**) vocational education. Prerequisite: consent of instructor and program coordinator.

491-1 to 5 Advanced Occupational Skills. Modern occupational practice in selected fields. For experienced professionals seeking advanced techniques in specialized areas of vocational education. (**a**) Agricultural education, (**b**) business education, (**c**) home economics education, (**d**) industrial education, (**e**) health occupations education. Prerequisite: intermediate level study in the specialty.

494-1 to 4 Workshop. Study of current issues of importance to vocational, occupational, and career education teachers, supervisors, and administrators. Emphasis of each workshop will be identified in each workshop announcement. (**a**) Agricultural education, (**b**) business education, (**c**) clothing and textiles, (**d**) education, training and development, (**e**) health occupations education, (**f**) home economics education, (**g**) industrial education, (**h**) vocational education.

495-2 to 12 Teaching Internship. Internship teaching in vocational programs in approved centers. The intern teacher will follow the program of the supervising teacher in both regular and extra class activities. May include independent study. (**a**) Agricultural education, (**b**) business education, (**c**) home economics education, (**d**) industrial education, (**e**) health occupations education. Prerequisite: 18 months full-time equivalent of documented or nine months full-time equivalent of supervised experience or a combination.

497-1 to 6 Practicum. Applications of vocational, occupational, and career education skills and knowledge. Cooperative arrangements with corporations and professional agencies to study under specialists. (**a**) Agricultural education, (**b**) business education, (**c**) clothing and textiles, (**d**) education, training and development, (**e**) health occupations education, (**f**) home economics education, (**g**) industrial education, (**h**) vocational education. Prerequisite: twenty hours in specialty.

498-1 to 5 Special Problems. Assistance and guidance in the investigation and solution of vocational, occupational, or career education problems. May include independent study. (**a**) Agricultural education, (**b**) business education, (**c**) clothing and textiles, (**d**) education, training and development, (**e**) health occupations education, (**f**) home economics education, (**g**) industrial education, (**h**) vo-

cational education. Prerequisite: consent of instructor and program coordinator.

510-3 Improvement of Instruction in Business Education. Designed for the experienced teacher who is interested in the study of curriculum and teaching problems in business education. Deals with teaching procedures, instructional materials, tests and evaluation, and organizations of teaching units and projects. Prerequisite: 310 or 410 or consent of instruction; teaching experience in business.

518-3 Home Economics Programs in the Schools. Curriculum development in vocational home economics is the focus. Units in family life education, consumer-homemaking, and occupational programs are developed by students for use in their professional responsibilities. Offered alternate years.

520-3 Trends and Issues in Home Economics Education. Analysis and appraisal of current trends, problems, and issues in the field. Attention is given to implications for teachers.

521-3 Advanced Methods of Teaching Home Economics. Recent trends in methodology based on research and experimentation. Attention given to methods which promote cognitive, affective, and psychomotor learnings. Preparation of materials for special interests of students. Offered alternate years.

538-2 College Teaching of Clothing and Textiles. Central ideas, objectives, and current practices. For preparation of college teachers.

547-3 Foundations of Fashion. Anthropological approaches to fashion and socioeconomic and psychological forces as determinants of fashion in modern times. Prerequisite: 347 or consent of instructor.

561-3 Research Methods. Basic research methods and techniques in the design, investigation, and reporting of research studies relating to education for work.

562-3 Legislation and Organization. Historical and contemporary thought and practice regarding federal and state legislation related to education for work. Legislators are used as resource persons. Required for supervisors.

564-3 Program Evaluation for Work Education. Evaluation systems and activities for evaluating national, state, and local work education programs. Systems include programmatic accreditation and state agency evaluations. Activities include personnel, facilities, access and equity, community resources, and community needs evaluations.

566-3 Administration and Supervision. Nature, function, and techniques of administration and supervision of education for work programs at all levels.

568-3 Facilities Planning. Principles and practices of planning classrooms and laboratories for various education for work programs. How to work with administrators, staff, and paid professionals to assure judicious location and design of facilities.

572-3 Trends and Issues in Cooperative Vocational Education. Theoretical basis of, and trends and issues in cooperative vocational education (CVE). Historical research into CVE, current directions, and related literature. Investigations into development, implementation, and evaluation of CVE programs. Concentration on administration and supervision of major components. Special emphasis on developing a CVE program. Prerequisite: 472.

574-3 Occupational Information. The role of instructional and supervisory personnel in the total occupational information system. Kindergarten to adult.

576-6 (3,3) Policy Implementation and Supervision. Planning, implementing, and controlling local education agency components of state and federal occupational programs. **(a)** Objective program planning, leadership, communications. **(b)** Management information systems, financial decisions, staffing patterns.

578-3 Programs in Diverse Settings. Similarities and dissimilarities of education for work programs in public/private, civilian/military, union/management, and other settings. Expectation of instructional and supervisory personnel. Professional contributions of post-secondary teachers.

580-3 Characteristics of Clientele. Familiarization with the characteristics and programming needs of clientele served by various education for work programs.

584-3 Curriculum Foundations for Work Education. Acquaints students with different factors that influence, direct, and shape curriculum as it pertains to the work-oriented aspects of school and society. Topics include law and the curriculum, philosophies and organizational models, differing approaches by grade level and setting, and the development of work-related curriculum.

586-3 Adult Vocational Programs. Philosophy of adult education; current organizational patterns of adult programs; unit planning, methods, techniques, and resources.

588-3 Performance-Based Professional Development. Key concepts, terminology, advantages, limitations, and techniques for using performance-based teacher education. Major performance-based teacher education models. Procedures for implementing pre-service and in-service programs. Published learning packages are used to develop skill in teaching in and managing performance-based teacher education programs. Prerequisite: admission to the Ph.D. program.

590-1 to 9 Readings. Supervised readings in selected advanced subjects. Prerequisite: consent of instructor.

591-1 to 9 New Developments. Recent developments and trends in various aspects of education for work. Instruction provided by recognized authorities.

592-3 Current Issues and Research. Examination of broad topics, issues, and research not covered in other regularly scheduled courses. Emphasis will be on recent and present issues which are in the process of evolving. Content will be selected from three primary professional fields: (a) vocational/technical education, (b) employment and training, and (c) career education. Required of all Ph.D. students.

593-1 to 6 Individual Research. The selection and investigation of a research topic culminating in a paper satisfying the research requirement for a Master of Science in Education degree. Prerequisite: consent of instructor.

594-3 Advanced Research Methods. Development of research competencies and preparation of proposal for thesis or dissertation research. Familiarity with research in various foundation areas of education for work.
595-1 to 16 Professional Internship. Supervised professional experience in appropriate educational settings. May be done on- or off-campus.
598-1 to 6 Special Investigations. Selection and investigation of a problem: use of relevant sources and techniques; collection and analysis, evaluation, and interpretation of data, and the writing of a report of the investigation for students whose particular needs are not met by existing classes. Prerequisite: consent of instructor.
599-1 to 6 Thesis.
600-1 to 36 (1 to 12 per semster) Dissertation.
601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

Women's Studies

There is no approved graduate program in women's studies. Four-hundred level courses may be taken for graduate credit unless otherwise indicated in the course description.

427-3 Women in the Visual Arts. (See Art 457)
442-4 Sociology of Gender. (See Sociology 423)
445-3 Women and the American Political Process. (See Political Science 429)
454-3 to 6 Topics in Women's Literature. (See English 496)
456-3 Philosophical Perspectives on Women. (See Philosophy 446)
463-2 Greek Literature in Translation. (See Classics 405)
476-3 Women and the Criminal Justice System. (See Administration of Justice 460)
490-1 to 6 Readings. Supervised readings in selected content areas of women's studies. Prerequisite: consent of instructor and women's studies coordinator.
491-1 to 6 Special Topics. Concentration on a topic of interest not offered through the regular course listings. Prerequisite: consent of instructor and women's studies coordinator.
492-3 to 6 Seminar in Women's Studies. A synthesizing experience required of seniors completing a minor in women's studies. Activity may include, but is not limited to, the preparation and presentation of a scholarly paper or the conduct of a research project. Prerequisite: 221 or 222, senior standing, and consent of women's studies coordinator.
493-2 to 6 Individual Research. Exploration of a research project under the supervision of a faculty member having graduate faculty status. The project must result in a written research report which is filed with the coordinator of women's studies. Prerequisite: consent of instructor and coordinator of women's studies and senior standing.
494-1 to 6 Practicum. Supervised practical experience in situations centering on women's issues, organizations, services, etc. The setting may be in one's own field of study or in the general content areas recognized in the women's studies program. Prerequisite: consent of instructor and coordinator of women's studies.
560-3 Gender and Sport. (Same as PE 560.)

Zoology

Students enrolled in zoology courses may incur field trip or laboratory expenses of $5 to $25.

400-3 Cell Biology of Development. Cellular molecular mechanisms of embryogenesis and differentiation. Examination of the cell as a component of interacting tissues constituting the developing organism. Prerequisite: consent of instructor, 300 or advanced standing in Biology.
401-3 Developmental Neurobiology. This course presents a survey of the basic principles that underlie the development of the nervous system, including an examination of the important questions and issues currently being studied by neuroembryologists. Prerequisite: advanced standing in biology/science or consent of instructor.
402-3 Natural History of Invertebrates. Introduction to ecology, intraspecies communication and interspecies relationships of invertebrate animals. Recommended for teacher preparation programs. Two lectures and one 2-hour laboratory per week. Offered Fall term. Prerequisite: 220a.
403-3 Natural History of Vertebrates. Life histories, adaptations, and identification of fish, amphibians, reptiles, birds, and mammals, emphasizing local species. Recommended for teacher preparation programs. One lecture and two 2-hour laboratories per week. Offered Spring semester. Prerequisite: 220b or consent of instructor.
404-3 Evolutionary Biology. Concepts and principles of modern evolutionary theory at a level appropriate for upper-division majors and graduate students in any biological science. Prerequisite: 220a,b or equivalent and Biology 305 or consent of instructor.
405-3 Systematic Zoology. Theory and procedure of classification; population taxonomy; variation and its analysis; rules of zoological nomenclature; taxonomic publication. Three one-hour lecture-discussion meetings per week. Prerequisite: 220a, b and consent of instructor.
406-3 Protozoology. Taxonomy, cytology, reproduction, and physiology of unicellular animals. Laboratory methods for culture and study. One lecture and two 2-hour laboratories per week. Offered Fall term. Prerequisite: 220a.
407-4 Parasitology. Principles, collection, identification, morphology, life histories, and control measures. Two lectures and two 2-hour labo-

ratories per week. Offered Spring term. Prerequisite: 220a.

408-3 Herpetology. Taxonomic groups, identification, morphology, and natural history of amphibians and reptiles. One lecture and two 2-hour laboratories per week. Offered Fall term. Prerequisite: 220b.

409-4 Vertebrate Histology. Microscopic structure of organs and tissues with emphasis on mammalian material. Two lectures and two 2-hour laboratories per week. Offered Spring term. Prerequisite: 10 to 12 semester hours of biological science.

413-4 The Invertebrates. Structure, phylogeny, distinguishing features and habitats of the invertebrates. Two lectures and two two-hour laboratories per week. Offered Spring term. Prerequisite: 220a.

414-4 Freshwater Invertebrates. Taxonomic groups, identification, distribution, and habitats of the North American freshwater invertebrate fauna. Two lectures, two 2-hour laboratories per week. Offered Fall term. Prerequisite: 220a.

415-3 Limnology. Lakes and inland waters; the organisms living in them, and the factors affecting these organisms. Two lectures per week and one 4-hour laboratory alternate weeks. Offered Fall term. Prerequisite: 220a.

421-4 Histological Techniques. Methods of preparing animal tissue for microscopic study and learn theories of staining and histochemistry. One lecture and two 3-hour laboratories per week. Offered Fall term. Prerequisite: 10 semester hours of biological science.

426-3 Comparative Endocrinology. Comparison of mechanisms influencing hormone release, hormone biosynthesis, and the effects of hormones on target tissues. Include ablation and histology of glands and chemical and bio-assays with vertebrates and invertebrates. Two lectures and one 2-hour laboratory per week. Offered Spring term. Prerequisite: consent of instructor.

430-3 Molecular Evolution and Systematics. Survey of the theory and processes of organic evolution at the level of protein and DNA sequences in animals. Quantitative analysis of empirical genetic information; methods of phylogenetic inference from molecular data. Three lectures per week. Prerequisite: BIOL 305 and consent of instructor.

460-2 Upland Game Birds. Identification, life history, ecology, and management. One lecture and one 2-hour laboratory per week; there will be up to three Saturday field trips. Offered Spring term. Prerequisite: 220b or consent of instructor.

461-3 Mammalogy. Taxonomic characteristics, identification, and natural history of mammals. Two one-hour lectures and one 2-hour laboratory per week. Offered Spring semester. Prerequisite: 220b.

462-3 Waterfowl. Identification, life history, ecology, and management. Two lectures and one 2-hour laboratory per week; there will be three or four Saturday field trips. Prerequisite: 220b or consent of instructor.

463-3 Game Mammals. Natural history and management. Two lectures and one 2-hour laboratory per week. Prerequisite: 220b or consent of instructor.

464-3 Wildlife Administration and Policy. Responsibilities of private, state, and federal natural resources management agencies. Legal and political processes in areas of wildlife and natural resources. Three lecture per week. Offered Spring term. Prerequisite: consent of instructor.

465-3 Ichthyology. Taxonomic groups, identification, and natural history of fishes. Two lectures and one 2-hour laboratory per week. Offered Spring term. Prerequisite: 220b.

466-3 Fish Management. Sampling, age and growth, dynamics, habitat improvement, manipulation of fish populations, and management of freshwater and marine fish stock. Two lectures per week and one 4-hour laboratory alternate weeks. Offered Fall term. Prerequisite: 10 hours of biological science.

467-3 Ornithology. Classification and recognition of birds and the study of their songs, nests, migratory habits, and other behavior. One lecture and one 4-hour laboratory per week. Offered Spring term. Prerequisite: 220b.

468-6 (3, 3) Wildlife Biology. Basic concepts and techniques for managing wildlife populations and their habitats. A basic ecology course is desirable as background for this course. (**a**) Principles. Three 1-hour lectures per week. (**b**) Techniques. Two 3-hour laboratory sessions per week, four of which may be field trips on Saturdays. Offered Fall term. Prerequisite: 10 semester hours of biological science; concurrent enrollment in 468a and 468b desirable.

471-4 Entomology. Structure, classification, and life histories of insects. Two lectures and two 2-hour laboratories per week. Offered Fall term. Prerequisite: 220a.

473-3 Aquatic Entomology. Structure, classification, and biology of aquatic insects. One lecture and two 2-hour laboratories per week. Offered Spring term. Prerequisite: 220a.

475-3 Advanced Cell Biology. (Same as Plant Biology 475) Cell structure at molecular and cytological levels. Includes discussions of research methods, and plasma membrane, cell exterior and recognition, the endomembrane system and related organelles, self-replicating organelles, the cytoskeleton, nuclear structure and function in cell replication, cell differentiation and response, and eukaryotic cell evolution. Prerequisite: BIOL 306 or equivalent.

476-2 Advanced Cell Biology Laboratory. (Same as Plant Biology 476) Laboratory course to accompany 475. Light and electron microscopy, cell culturing, biochemical methods, and experimental protocols are used to study the structure of cell membranes, intracellular organelles, including the Golgi apparatus, ER, mitochondria, plastids, and lysosomes, the cytoskeleton and nucleus. Prerequisite: 475 or concurrent enrollemnt.

478-3 Animal Behavior. Biological basis of the behavior of animals. Two lectures and one 2-hour laboratory per week. Offered Fall semester. Prerequisite: one year of biological science or permission of instructor.

480-3 to 5 Research Methods in Animal Behavior. Skills relevant to doing research in animal behavior. Guided self-instructional format, with two 3-hour periods scheduled weekly, primarily as question-answer and evaluation ses-

sions. Offered Spring semester. Prerequisite: at least *B* work in 478 or permission of instructor.

485-2 to 4 Special Topics in Zoology. Examination of topics of special interest not available in other departmental courses. Offered in response to student need and faculty availability. Prerequisite: consent of instructor.

496-2 to 4 Zoology Field Studies. A trip of four to eight weeks to acquaint students with animals in various environments and with methods of field study, collection, and preservation. Offered Fall, Spring, Summer terms. Prerequisite: consent of department.

497-3 Helminthology. Identification, structure, physiology, and life history of parasitic helminths. Three lectures per week. Prerequisite: 407.

510-3 Seminar on Evolution. Current topics in evolutionary biology and systematics. Format is student presentations and group discussions of relevant literature and research. Prerequisite: consent of instructor.

512-2 Animal Geography. Considers the effects of historical and ecological factors on animal distribution. Two meetings per week. Prerequisite: consent of instructor.

514-3 Advanced Entomology. Morphology, physiology, systematics, and distribution of insects. One lecture and two 2-hour laboratories. Prerequisite: 471.

520-3 Advanced Invertebrates. The nature and life of invertebrate animals with emphasis on comparative form, function, behavior, and occurrence. Three 2-hour meetings per week. Prerequisite: consent of instructor.

521-3 Stream Ecology. The physical, chemical, and biological factors affecting organisms in streams. Two lectures per week and one 4-hour laboratory alternate weeks. Prerequisite: 415 and consent of instructor.

525-3 Cytology. An analysis of the subcellular and cytochemical organization of the cell. Structural-functional aspects of organelles, membranes, and other cellular components, their relationship to the metabolic nucleus, substructural organization of hereditary material, and subcellular aspects of mitosis and meiosis are emphasized. Two lectures and one laboratory per week.

530-3 Wildlife Diseases. Introduction to the causes and nature of diseases of wildlife with emphasis on wild mammals and birds. The relationship of disease to the population ecology of species will be emphasized further. Two lectures and one 2-hour laboratory per week. Offered Spring term. Prerequisite: consent of instructor.

532-3 Wildlife Toxicology. Fate and effects of environmental toxicants in wildlife. Review of descriptive and mechanistic toxicology for environmental contaminants. Investigation of the relationship between individual and community responses to toxicant exposure. Examination of current hazard assessment protocols and associated regulatory agencies. Prerequisite: 468a or consent of instructor.

540-3 Factors in Animal Reproduction. Genetic and physiological factors in determination, differentiation, and modification of sex in animals. Three lectures a week. Prerequisite: consent of instructor.

564-1 to 2 Fish Culture Techniques. Practical experience in fish culture techniques. Course consists of modules which require student participation in hands-on experience, (e.g., spawning, induction of spawning, production of fry, operation and grading, diagnosis and treatment of parasites and diseases, and transporting of fish). One credit for completion of 2 modules. Register any semester, one year to complete elected number of modules. Written report and examination required for each module. Cost incurred by student varies with modules selected. Prerequisite: 566 or consent of instructor.

565-3 Environmental Physiology of Fish. Synthesis of effects of pollutants on physiological processes of fish. Course begins with an overview of fish physiology. Topics include: concepts, methods, and measurements in aquatic toxicology; histopathological, physiological, and behavioral responses to pollutants; and toxicity of heavy metals, organics, particulates, and other pollutants. Three lectures per week. Prerequisite: 465 or consent of instructor.

566-3 Fish Culture. Production of game, food, and bait fishes. Design of facilities, chemical and biological variables, spawning techniques, diseases and nutrition. Two lectures per week and one 4-hour laboratory alternate weeks. Prerequisite: consent of instructor.

568-2 Fish Stock Assessment. Methods of characterizing fish populations including mortality rates, age growth analysis, population sampling, yield models, habitat evaluation procedures, and creel survey techniques. Two 1-hour meetings per week. Prerequisite: 466 or consent of instructor.

569-3 Advanced Fisheries Management. Advanced topics related to the management of fisheries including urban fisheries, native American fisheries, freshwater commercial fisheries, Great Lakes fisheries, impact of power generating plants on fishes, and in-depth consideration of indices of community structure and current topics in fish management. Three lectures per week. Prerequisite: 466 or consent of instructor.

570-3 Advanced Fish Culture. Methods for the production of coldwater, coolwater, warmwater, and tropical species. Three lectures a week. Prerequisite: 566 or consent of instructor.

573-3 Physiological Ecology. The role of physiological, morphological, and behavioral adaptations and adjustments in the ecology of vertebrate organisms with special emphasis on examining the energy balance and environment as it influences vertebrate ecology. Two hours of lecture and one 2-hour laboratory. Prerequisite: BIOL 307 or equivalent, and consent of instructor.

577-2 Population Ecology. Principles of population dynamics as related to animals. Two lectures per week. Prerequisite: consent of instructor.

578-2 Population Genetics. Genetic structure of populations, factors causing changes, and principles governing rate and direction of change. Two lectures per week. Prerequisite: consent of instructor.

579-3 Techniques of Population Genetics. Practical experiences in genetic analysis of populations using molecular techniques. Emphasis will be on traditional allozyme methods, but an introduction to mtDNA analysis will be included. Class projects will include both data collection and data

analysis. Prerequisite: 578 or consent of instructor.

582-1 to 4 (1,1,1,1) Graduate Zoology Seminars. Special topics in zoology. Consult department for each semester's topic. One meeting per week. Prerequisite: consent of instructor and department.

583-1 Teaching Zoology in College. Methods, practices, and objectives in teaching zoology at the college/university level. Designed as part of the apprenticeship program for preparation of college teachers. Required of departmental teaching assistants. One hour lecture per week. Graded *S/U* only. Prerequisite: graduate status in a biological science.

584-3 Fish Genetics. Genetic principles and their application to management and culture of fish. Course includes an overview of biochemical and molecular genetics, conservation genetics, genomic manipulations, and quantitative genetics. Prerequisite: BIOL 305 or consent of instructor.

585-36 (3,3,3,3,3,3,3,3,3,3,3,3) Seminar. Advanced study of special topics in zoology. **(a)** Seminar in animal behavior. **(b)** Seminar in neurobiology of metazoa. Survey of the cytology and histology of nerve cells, and the sheath elements separately as they appear in organized tissues of metazoa. **(c)** Seminar in ecosystems. **(d)** Seminar in wetland ecology. **(e)** Seminar in wildlife ecology: impact of land use. **(f)** Seminar in fish biology. Survey of fish biology and ecology dealing largely with topics not covered in 465. Life history strategies, physiology, and other fundamental biological features of fishes will be covered in some depth. Prerequisite: 465. **(g)** Seminar in parasitology. **(h)** Seminar on the amphibia. **(j)** Seminar in developmental biology. Detailed coverage of current topics of interest in developmental biology; the course will emphasize interacting systems in the development of both vertebrates and invertebrates, from the molecular to the tissue levels. Prerequisite: 300, BIOL 309, or equivalent. **(z)** Seminar in selected topics. Prerequisite: consent of instructor or department.

593-1 to 12 Individual Research. Investigation in zoology other than those for theses. Only three hours may be credited toward a degree. Some costs may be borne by the student.

597-1 to 12 Advanced Zoological Techniques. Individualized techniques or experimental procedures to prepare for dissertation research. May be taken at another university. Number of credits determined by committee. Graded on *S/U* basis following final report submitted to major adviser. Prerequisite: admission to Ph.D. degree program in zoology and consent of major adviser.

598-1 to 12 Research Paper. Preparation of research paper for Master of Science degree. Only two hours may count toward the degree. Some cost may be borne by the student. Prerequisite: consent of instructor. Graded *S/U* only.

599-1 to 12 Research and Thesis. Thesis for Master of Arts degree. Only 6 hours may count toward the degree. Some cost may be borne by student. Prerequisite: consent of instructor. Graded *S/U* only.

600-1 to 32 (1 to 16 per semester) Research and Dissertation. Research and dissertation for Doctor of Philosophy degree. Some cost may be borne by student. Graded *S/U* only. Prerequisite: consent of instructor.

601-1 per semester Continuing Enrollment. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation, thesis, or research paper. The student must have completed a minimum of 24 hours of dissertation research, or the minimum thesis, or research hours before being eligible to register for this course. Concurrent enrollment in any other course is not permitted. Graded *S/U* or *DEF* only.

4 Faculty

Graduate instruction is the responsibility of the graduate faculty. The faculty listed below are arranged in terms of their departmental affiliations. The college or school in which the department is located is also noted.

Faculty teaching in interdisciplinary programs are listed under the appropriate program and are identified as to the department in which they hold an appointment.

The first of the two dates listed with the name of a faculty member indicates the year in which the highest degree was earned; the second date indicates the year when the person first became a faculty member at Southern Illinois University at Carbondale.

Accountancy

COLLEGE OF BUSINESS AND ADMINISTRATION

Barron, Mary Noel, Associate Professor, *Emerita,* C.P.A., M.B.A., University of Michigan, 1946; 1948.

Basi, Bartholomew, Professor, C.P.A., D.B.A., Indiana University, 1971; 1978. Financial accounting, and taxation of closely-held companies.

Burger, Clifford R., Professor, *Emeritus,* C.P.A., M.S., Indiana State University, 1947; 1958.

Gribbin, Donald, Assistant Professor, C.P.A., Ph.D., Oklahoma State University, 1989; 1989. Managerial and cost accounting.

Hahn, Randall, Associate Professor, C.P.A., Ph.D., University of Kentucky, 1984; 1984. Taxation and auditing.

Karnes, Allan, Assistant Professor, C.P.A., M.A., J.D., Southern Illinois University at Carbondale, 1986; 1977. Taxation and auditing.

King, James, Assistant Professor, C.P.A., Ph.D., Indiana University, 1988; 1987. Behavioral auditing and managerial accounting.

Masoner, Michael M., Associate Professor, C.P.A., Ph.D., University of Minnesota, 1975; 1978. Accounting theory, cost accounting.

Rivers, Richard, Associate Professor, C.P.A., D.B.A., Kent State University, 1976; 1978. Quantitative decision models, and information systems.

Sobery, Julie, Associate Professor, C.P.A., Ph.D., Saint Louis University, 1982; 1985. Financial accounting.

Swick, Ralph D., Professor, *Emeritus,* C.P.A., D.B.A., Indiana University, 1954; 1955.

Tucker, Marvin W., Professor, Ph.D., University of Alabama, 1966; 1966. Financial accounting, managerial and cost accounting.

Wacker, Raymond, Assistant Professor, C.P.A., Ph.D., University of Houston, 1989; 1989. Taxation.

Welker, Robert B., Rehn Professor of Accountancy, Ph.D., Arizona State University, 1977; 1987. Financial accounting.

Wright, Roland M., Professor, *Emeritus,* C.P.A., Ph.D., University of Iowa, 1962; 1966.

Wu, Fred, Emerson Electric and Charles Groennert Professor of Research and *Director,* C.M.A., Ph.D., Texas Tech University, 1975; 1984. Information systems and managerial accounting.

Agribusiness Economics

COLLEGE OF AGRICULTURE

Beaulieu, Jeffrey R., Associate Professor, Ph.D., Iowa State University, 1984; 1983.

Beck, Roger J., Associate Professor, Ph.D., Pennsylvania State University, 1977; 1984.

Eberle, Phillip R., Associate Professor, Ph.D., Iowa State University, 1983; 1983.

Harris, Kim S., Associate Professor, Ph.D., University of Illinois, 1985; 1984.

Herr, William McD., Professor, Ph.D., Cornell University, 1954; 1957.

Keepper, Wendell E., Professor, *Emeritus,* Ph.D., Cornell University, 1938; 1950.

Kraft, Steven E., Professor, Ph.D., Cornell University, 1976; 1980.

Solverson, Lyle, Associate Professor and *Chair,* Ph.D., University of Wisconsin, 1967; 1966.

Wills, Walter J., Professor, *Emeritus,* Ph.D., University of Illinois, 1952; 1956.

Agricultural Education and Mechanization

COLLEGE OF AGRICULTURE

Benton, Ralph A., Professor, *Emeritus,* Ph.D., University of Illinois, 1955; 1956.
Doerr, William A., Associate Professor, *Emeritus,* Ph.D., Southern Illinois University at Carbondale, 1973; 1965.
Legacy, James, Professor, Ph.D., Cornell University, 1976; 1977.
Reneau, Fred, Associate Professor, Ed.D., Virginia Tech, 1979; 1979.
Smith, Owen R., Assistant Professor, Ph.D., Purdue University, 1988; 1988.
Stitt, Thomas R., Professor, Ph.D., Ohio State University, 1967; 1967.
Wolff, Robert L., Professor and *Chair,* Ph.D., Louisiana State University, 1971; 1972.
Wood, Eugene S., Professor, *Emeritus,* Ed.D., University of Missouri, 1958; 1949.

Animal Science, Food and Nutrition

COLLEGE OF AGRICULTURE

Arthur, Robert, Professor and *Chair,* Ph.D., University of Missouri, 1970; 1977. Monogastric nutrition, biochemistry.
Ashraf, Hea-Ran Lee, Assistant Professor, Ph.D., Iowa State University, 1979; 1980. Food science, food technology.
Becker, Henrietta, Lecturer, *Emerita,* M.S., Southern Illinois University at Carbondale, 1961; 1964.
Endres, Jeannette M., Professor, Ph.D., St. Louis University, 1972; 1975. Community nutrition, dietetics, life cycle nutrition.
Gardiner, Catherine, Assistant Professor, Ph.D., Oregon State University, 1988; 1988. Molecular biology.
Goodman, Bill L., Professor, *Emeritus,* Ph.D., Ohio State University, 1959; 1958.
Harper, Jenny M., Professor, *Emerita,* Ph.D., Cornell University, 1941; 1958.
Hausler, Carl L., Associate Professor, Ph.D., Purdue University, 1970; 1970. Reproductive physiology.
Hinners, Scott W., Professor, Ph.D., *Emeritus,* University of Illinois, 1958; 1951.
Kammlade, W. G., Jr., Associate Professor, *Emeritus,* Ph.D., University of Illinois, 1951; 1954.
King, Sheryl S., Associate Professor, Ph.D., University of California, Davis, 1982; 1982. Reproduction physiology, equine science.
Konishi, Frank, Professor, *Emeritus,* Ph.D., Cornell University, 1958.
Kroening, Gilbert H., Professor, Ph.D., Cornell University, 1965; 1969. Swine production, monogastric nutrition.
Olson, Howard H., Professor, *Emeritus,* Ph.D., University of Minnesota, 1952; 1954.
Payne, Irene R. Professor, *Emerita,* Ph.D., Cornell University, 1960; 1965.
Stokes, Sandra R., Assistant Professor, Ph.D., West Virginia University, 1990; 1990. Ruminant nutrition.
Strack, Louis E., Associate Professor, D.V.M., University of Illinois, 1961; 1968. Veterinary medicine.
Welch, Patricia K., Associate Professor, Ph.D., Southern Illinois University at Carbondale, 1982; 1974. Community nutrition, food service management.
Woody, Harold Dee, Associate Professor, Ph.D., Michigan State University, 1978; 1978. Ruminant nutrition, growth.
Young, Anthony W., Professor, Ph.D., University of Kentucky, 1969; 1980. Ruminant nutrition, forages.

Anthropology

COLLEGE OF LIBERAL ARTS

Adams, Jane H., Assistant Professor, Ph.D., University of Illinois-Urbana, 1987; 1987. Cultural anthropology, political economy, agricultural systems, history, gender roles; rural US, upper Amazon.
Bender, M. Lionel, Professor, Ph.D., University of Texas at Austin, 1968; 1971. Linguistic anthropology and interculture, comparative and historical linguistics, language classification, language in culture; Ethiopia, Africa, Middle East.
Benefit, Brenda R., Assistant Professor, Ph.D., New York University, 1987; 1990. Physical anthropology, primate paleontology (especially Old World monkeys and apes), evolutionary theory, paleoecology, functional anatomy, faunal analysis; Kenya.
Butler, Brian M., Adjunct Associate Professor, Ph.D., Southern Illinois University at Carbondale, 1977; 1977. Archaeology, cultural resource management, prehistoric subsistence and settlement systems; Southeastern and Midwestern USA, Micronesia.
Corruccini, Robert S., Professor, Ph.D., University of California, Berkeley, 1975; 1978. Physical anthropology, paleontology, osteology, multivariate methods, dental anthropology, epidemiology; India, Italy.
Dark, Philip J. C., Professor, *Emeritus,* Ph.D., Yale University, 1954; 1960.
Ford, Susan M., Associate Professor and *Director of Graduate Studies,* Ph.D., University of Pittsburgh, 1980; 1979. Physical anthropology, primate paleontology and systematics, evolutionary theory, anatomy, South America.
Gumerman, George J., Professor, Ph.D., University of Arizona, 1968; 1973. Archaeology, archaeological cooperatives, paleoenvironmental reconstructions, conservation archaeology; US Southwest and Micronesia.
Handler, Jerome S., Professor, Ph.D., Brandeis University, 1965; 1962. Cultural anthropology, ethnohistory, Afro-American studies, slavery, plantation and peasant communities, historical archaeology; Caribbean West Africa.
Hill, Jonathan D., Associate Professor and *Director of Undergraduate Studies,* Ph.D., Indiana University, 1983; 1986. Ethnology, ecology, history, ethnomusicology, structural-semantic analysis; Amazon.
Kelley, J. Charles, Professor, *Emeritus,* Ph.D., Harvard University, 1948; 1950.

Maring, Ester G., Assistant Professor, Ph.D., Indiana University, 1969; 1965. Folklore, ethnology, acculturation, anthropology of religion, customary law and ethics; Southeast Asia, US Pueblos.
Maring, Joel M., Associate Professor, Ph.D., Indiana University, 1967; 1963. Linguistics, educational anthropology, ethnomusic; US Southwest, Southeast Asia, New Guinea.
Muller, Jon D., Professor and *Chair,* Ph.D., Harvard University, 1967; 1966. Archaeology, art analysis and culture theory; Eastern USA, Africa.
Rands, Robert L., Professor, Ph.D., Columbia University, 1952; 1966. Archaeology, ceramic technology, trace-element analysis, comparative art; Mesoamerica.
Riley, Carroll L., Distinguished Professor, *Emeritus,* Ph.D., University of New Mexico, 1952; 1955.
Smiley, Francis E., Adjunct Assistant Professor, Ph.D., University of Michigan, 1985; 1985. Archaeology, method and theory, human ecology, chronometric studies, museology, ethnoarchaeology; US Southwest, high Plains.
Taylor, Walter W., Professor, *Emeritus,* Ph.D., Harvard University, 1943; 1958.
Teltser, Patrice A., Assistant Professor, Ph.D., University of Washington, 1988; 1988. Archaeology, North American prehistory, evolutionary theory, quantitative methods, lithic and ceramic analysis; eastern US.

Art

COLLEGE OF COMMUNICATIONS AND FINE ARTS

Abrahamson, Roy E., Associate Professor, Ed.D., Columbia University, 1965; 1965. Art education.
Addington, Aldon M., Associate Professor, M.F.A., Cranbrook Academy of Art, 1966; 1967. Sculpture.
Archer, Richard, Assistant Professor, M.S., Governor's State University, 1979; 1968. Design.
Bernstein, Lawrence A., Associate Professor, M.F.A., Cranbrook Academy of Art, 1953; 1962. Drawing and painting.
Bhattacharya, Sunand, Assistant Professor, M.A., Ohio State University, 1987; 1987. Design.
Boysen, Bill H., Associate Professor, M.F.A., University of Wisconsin, 1966; 1966. Ceramics, glassblowing.
Briggs, Larry S., Associate Professor, B.F.A., University of Oklahoma, 1956; 1985. Visual communications.
Busch, Larry, Associate Professor, M.S., Southern Illinois University at Carbondale, 1970; 1970. Design.
Chapman, Gretel, Associate Professor, Ph.D., University of Chicago, 1964; 1984. Art history.
Deller, Harris, Professor, M.F.A., Cranbrook Academy of Art, 1973; 1975. Ceramics.
Feldman, Joel B., Associate Professor, M.F.A., Indiana University, 1967; 1973. Printmaking, lithography.
Fink, Herbert L., Distinguished Professor, M.F.A., Yale University, 1958; 1961. Drawing and printmaking, etching.
Greenfield, Sylvia R., Professor, M.F.A., University of Colorado, 1967; 1968. Drawing and painting.
Kington, L. Brent, Professor and *Director,* M.F.A., Cranbrook Academy of Art, 1961; 1961. Metals, blacksmithing.
Lintault, M. Joan, Professor, M.F.A., Southern Illinois University at Carbondale, 1962; 1973. Fibers and weaving.
Mavigliano, George J., Associate Professor, M.A., Northern Illinois University, 1967; 1970. American art and architecture.
Mawdsley, Richard W., Professor, M.F.A., University of Kansas, 1969; 1978. Metalsmithing.
Onken, Michael O., Associate Professor, M.A., Northern Illinois University, 1966; 1968. Drawing and painting.
Paulson, Robert L., Professor, M.F.A., University of Wisconsin, 1967; 1967. Drawing and painting.
Saunders, Ann, Assistant Professor, M.F.A., Syracuse University, 1984; 1986. Visual communications.
Shay, Edward H., Professor, M.F.A., University of Illinois, 1971; 1978. Drawing, painting, and printmaking.
Sullivan, James E., Associate Professor, M.A., University of California, Los Angeles, 1965; 1969. 19th century and modern art and interdisciplinary studies.
Sullivan, Milton F., Professor, *Emeritus,* M.A., Columbia University, 1951; 1952.
Walsh, Thomas J., Professor, M.F.A., University of Michigan, 1962; 1967. Sculpture and foundry.
Youngblood, Michael, Associate Professor, Ph.D., University of Oregon, 1975; 1979. Art education.

Center for the Study of Crime, Delinquency, and Corrections

COLLEGE OF LIBERAL ARTS

Adams, Kenneth G., Associate Professor, Ph.D., State University of New York at Albany, 1984; 1990. Criminal justice; corrections; research methods; mentally disordered offenders; violence.
Anderson, Dennis B., Associate Professor and *Director,* Ed.D., University of Nebraska, 1970; 1970. Educational psychology; forensic and criminal justice psychology.
Castellano, Thomas C., Assistant Professor, Ph.D., State University of New York, Albany, 1986; 1986. Criminal justice; juvenile justice; research methods.
Coughlin, Joseph S., Professor, *Emeritus,* M.S.W., A.C.S.W., University of Wisconsin, 1954; 1973.
Cowles, Ernest L., Assistant Professor, Ph.D., Florida State University, 1981; 1990. Criminology; correctional administration; criminal justice policy; offender classification; criminal justice problem identification and structuring.
Ferdinand, Theodore N., Professor, Ph.D., University of Michigan, 1961; 1985. Social psychology; juvenile delinquency; juvenile justice; history of crime and criminal justice.
Johnson, Elmer H., Distinguished Professor, *Emeritus,* Ph.D., University of Wisconsin, 1950; 1966.

LeBeau, James L., Associate Professor, Ph.D., Michigan State University, 1978; 1985. Geography; geography of crime and criminal justice; law enforcement; quantitative methods.
Lorinskas, Robert, Associate Professor, Ph.D., University of Georgia, 1973; 1980. Political science; security.
Matthews, Charles V., Associate Professor, *Emeritus,* M.A., University of Kansas City, 1951; 1962.
Riedel, Marc P., Associate Professor, Ph.D., University of Pennsylvania, 1972; 1978. Sociology; research methods; violence.
Robinson, Cyril D., Professor, *Emeritus,* LL.B., Northwestern University, 1952; 1979.
Small, Mark A., Assistant Professor, J.D., Ph.D., University of Nebraska, 1990; 1990. Psychology and law; mental health law; privacy; children and the law; program evaluation.

Chemistry and Biochemistry

COLLEGE OF SCIENCE

Arnold, Richard T., Professor, *Emeritus,* Ph.D., University of Illinois, 1937; 1969.
Bausch, Mark J., Assistant Professor, Ph.D., Northwestern University, 1982; 1987. Organic radical anion basicities, radical acidities, stability of organic cations.
Beyler, Roger E., Professor, *Emeritus,* Ph.D., University of Illinois, 1949; 1959.
Bolen D. Wayne, Professor, Ph.D., Florida State University, 1969; 1971. Physical biochemistry, dynamics and thermodynamics accompanying interactions of substrates and inhibitors with enzymes, fast-reaction kinetics, calorimetry of biochemical transformations.
Brown, George E., Professor, *Emeritus,* Ph.D., Iowa State University, 1941; 1962.
Caskey, Albert L, Associate Professor, *Emeritus,* Ph.D., Iowa State University, 1961; 1964.
Davis, Joe M., Assistant Professor, Ph.D., University of Utah, 1985; 1987. Analytical, mass transport, separations, electrochemistry.
Gaston, Rick D., Assistant Professor, Ph.D., Indiana University, 1987; 1989. Synthetic organic chemistry, organometallic chemistry.
Groziak, Michael P., Assistant Professor, Ph.D., Northwestern University, 1983; 1989. Organic, bioorganic and medical chemistry, nucleoside/heterocycle synthesis, organic/enzymatic reaction mechanisms, mechanism-based enzyme inactivation.
Gupta, Ramesh, Associate Professor, Ph.D., University of Illinois, 1981; 1984. Biochemistry, molecular biology of archaebacteria.
Guyon, John C., Professor, Ph.D., Purdue University, 1961; 1974.
Hadler, Herbert I., Professor, *Emeritus,* Ph.D., University of Wisconsin, 1952; 1966.
Hadley, Elbert H., Professor, *Emeritus,* Ph.D., Duke University, 1940; 1947.
Hardwicke, Peter, Associate Professor, Ph.D., M.D., University of London, 1969; 1984. Biochemistry, calcium ion transport across muscle membrane, properties of actin and myosin.
Hinckley, Conrad C., Professor, Ph.D, University of Texas, 1964; 1966. Inorganic, magnetic resonance of transition metal complexes, osmium chemistry, iron chemistry in coal.
Koropchak, John A., Associate Professor, Ph.D., University of Georgia, 1980; 1984. Analytical, atomic spectroscopy, atmospheric pressure ionization mass spectrometry, metal speciation, plasma chemistry.
Koster, David F., Professor, Ph.D., Texas A&M University, 1965; 1967. Physical, molecular structure, NMR, vibrational spectroscopy, laser-induced reactions.
Lewis-Bevan, Wyn, Assistant Professor, Ph.D., University of Cambridge, 1983; 1987. Physical chemistry, high resolution gas phase spectroscopy using infrared semi-conductor diode lasers, molecular ions.
Meyers, Cal Y., Professor, Ph.D., University of Illinois, 1951; 1964. Organic, nucleophilic vs electron-transfer reactions and reactivities of anions, halogenation of anions with CX4, electron-transfer pathways in biological reactions, correlation of structure with in vivo and receptor-site activity of estrogens.
Neckers, J. W., Professor, *Emeritus,* Ph.D., University of Illinois, 1927; 1927.
Niederhoffer, Eric C., Assistant Professor, Ph.D., Texas A & M University, 1983; 1990. Metal ion uptake, transport, effects on gene expression, toxic metal bioremediation, metalloprotein structure.
Phillips, John B., Associate Professor, Ph.D., University of Arizona, 1977; 1977. Analytical, chromatography, surface chemistry, laboratory computing, instrumentation.
Scheiner, Steve, Professor, Ph.D., Harvard University, 1976; 1978. Physical, theoretical biophysical chemistry, protein conformation, hydrogen bonding, proton transfers, opiate derivatives.
Schmidhauser, Thomas J., Assistant Professor, Ph.D., University of California at San Diego, 1986; 1989. Biochemistry, photoregulation of gene expression, molecular biology of filamentous fungi.
Schmit, Joseph G., Associate Professor, Ph.D., Purdue University, 1971; 1976. Biochemistry, developmental biochemistry and genetics, regulation of enzymatic activity, genetic and biochemical control of amino acid metabolism, molecular basis of circadian rhythms.
Schmulbach, C. David, Professor and *Acting Chair,* Ph.D., University of Illinois, 1958; 1965. Inorganic stabilization of uncommon oxidation states, activation of small molecules by complexation and homogeneous catalysis.
Shriver, John W., Associate Professor, Ph.D., Case Western Reserve University, 1977; 1981. Biochemistry, nuclear magnetic resonance spectroscopy, mechanism of muscle contraction, energy transduction, myosin structure changes associated with force production in muscle.
Smith, Gerard V., Professor, Ph.D., University of Arkansas, 1959; 1966. Organic, mechanisms of surface reactions, heterogeneous catalytic hydrogenation and exchange, asymmetric catalysis, catalytic oxidation and ozonation, molecular probes for characterization of metal surfaces, metallic glasses as catalysts, iron sulfides as catalysts, coal conversion catalysis, stereo-chemistry, hydrodesulfurization.

Trimble, Russell F., Professor, Ph.D., Massachusetts Institute of Technology, 1951; 1954. Inorganic coordination compounds, synthesis, chemical literature, history of chemistry.
Tyrrell, James, Professor, Ph.D., University of Glasgow, 1963; 1967. Physical, theoretical calculations on atoms and molecules.
Van Lente, Kenneth A., Professor, *Emeritus,* Ph.D., University of Michigan, 1931; 1931.
Woodruff, Michael L., Assistant Professor, Ph.D., University of Wisconsin-Madison, 1978; 1986. Biochemistry, interactions within nervous system controlling nerve cell response, ion channel activity modification.
Wotiz, John H., Professor, *Emeritus,* Ph.D., Ohio State University, 1948; 1967.

Cinema and Photography

COLLEGE OF COMMUNICATIONS AND FINE ARTS

Blumenberg, Richard M., Professor, Ph.D., Ohio University, 1969; 1970. Screenwriting and cinema studies.
Boruszkowski, Lilly A., Associate Professor, M.F.A., Northwestern University, 1979; 1982. Cinema production.
Cocking, Loren D., Assistant Professor, M.A., Ohio State University, 1969; 1976. Cinema production.
Covell, Michael D., Assistant Professor, M.F.A., Ohio University, 1975; 1975. Cinema production.
Gilmore, David A., Associate Professor and *Chair,* M.F.A., Ohio University, 1969; 1969. Photography.
Kolb, Gary P., Associate Professor, M.F.A., Ohio University, 1977. Photography.
Mercer, John, Professor, *Emeritus,* Ph.D., University of Nebraska, 1952; 1958.
Paine, Frank, Associate Professor, *Emeritus,* B.S., Iowa State University, 1950; 1960.
Powell, W. Duane, Assistant Professor, M.F.A., University of Illinois, 1977; 1978. Photography.
Roddy, Jan Peterson, Assistant Professor, M.F.A., University of Illinois, 1987; 1988. Photography.
Swedlund, Charles A., Professor, M.S., Illinois Institute of Technology, 1961; 1971. Photography.
Williams, Tony, Assistant Professor, Ph.D., University of Manchester, 1974; 1984. Cinema studies.

Civil Engineering and Mechanics

COLLEGE OF ENGINEERING AND TECHNOLOGY

Cook, Echol E., Professor, Ph.D., Oklahoma State University, 1970; 1971. Biological waste treatment, fixed bed reactors, solid waste disposal.
Craddock, James N., Associate Professor, Ph.D., University of Illinois, 1979; 1980. Solid mechanics, stress analysis; computational mechanics, composite materials.
Das, Braja M., Professor and *Chair,* Ph.D., University of Wisconsin, 1972; 1987. Geotechnical engineering, foundation design, soil improvement.
Davis, Philip K., Professor, Ph.D., University of Michigan, 1963; 1964. Fluid mechanics, hydraulics, solid-liquid separation and vibrations.
DeVantier, Bruce A., Associate Professor, Ph.D., University of California-Davis, 1983; 1983. Water quality modeling, sediment transport, turbulence modeling, finite element methods.
Evers, James L., Associate Professor, Ph.D., University of Alabama, 1969; 1969. Compressible fluid flows, dynamics, pneumatic transport, hydraulic transients.
Ghafoori, Nader, Assistant Professor, Ph.D., University of Miami, 1986; 1989. Recycling and utilization of industrial wastes for construction applications, wastes in concrete, durability, strength and behavior of concrete systems.
Kassimali, Aslam, Associate Professor, Ph.D., University of Missouri, 1976; 1980. Structural engineering, nonlinear structural analysis, structural dynamics and stability.
Nowacki, C. Raymond, Associate Professor, Ph.D., University of Illinois, 1965; 1963. Structural analysis and design of bridges and buildings.
Puri, Vijay, Assistant Professor, Ph.D., University of Missouri-Rolla, 1984; 1986. Geotechnical engineering, soil dynamics, machine foundations, liquefaction of soils.
Ray, Bill T., Associate Professor, Ph.D., University of Missouri-Rolla, 1984; 1985. Chemical and biological treatment, fixed-film reactors, residuals management, toxic waste treatment.
Rubayi, Najim, Professor, *Emeritus,* Ph.D., University of Wisconsin, 1966; 1966.
Sami, Sedat, Professor, Ph.D., University of Iowa, 1966; 1966. Fluid mechanics, hydraulics and hydrology.
Yen, Shing-Chung, Associate Professor, Ph.D., Virginia Polytechnic Institute, 1984; 1984. Composite materials, experimental mechanics, solid mechanics, and structural dynamics.

Communication Disorders and Sciences

COLLEGE OF COMMUNICATIONS AND FINE ARTS

Anderson, John O., Professor, *Emeritus,* Ph.D., Ohio State University, 1950; 1950.
Blache, Stephen E., Associate Professor, Ph.D., Ohio University, 1970; 1971. Phonology, distinctive feature theory, experimental phonetics, research design.
Brackett, Isaac P., Professor, *Emeritus,* Ph.D., Northwestern University, 1947; 1951.
Brutten, Gene J., Professor and *Chair,* Ph.D., University of Illinois, 1957; 1957. Stuttering, research design, behavior therapy, aural rehabilitation.
Garbutt, Cameron W., Associate Professor, *Emeritus,* Ph.D., Louisiana State University, 1951; 1947.
Gonzalez, Lori Stewart, Assistant Professor, Ph.D., University of Florida, 1989; 1988. Phonology, multicultural issues, clinical applications.
Hinton, Virginia A., Assistant Professor, Ph.D., University of Iowa, 1989; 1989. Craniofacial anomolies and speech physiology.
Hoshiko, Michael S., Professor, Ph.D., Purdue University, 1957; 1957. Biofeedback, instrumentation, speech science, neuropsychology of speech.
Koepp-Baker, Herbert, Professor, *Emeritus,* Ph.D., University of Iowa, 1938; 1961.

Lehr, Robert P. Jr., Professor, Ph.D., Baylor University, 1971; 1973. Neuroanatomy, medical problems of speech.
Moncur, John P., Professor, *Emeritus,* Ph.D., Stanford University, 1950; 1972.
Robey, Randall R., Assistant Professor, Ph.D., Ohio University, 1984; 1984. Neurogenic communication disorders, multivariate statistics.
Ruder, Kenneth F., Professor, Ph.D., University of Florida, 1969; 1984. Psycholinguistics-child language and language intervention.
Schultz, Martin C., Professor, Ph.D., University of Iowa, 1955; 1986. Audiology, methodology.

Community Development

COLLEGE OF LIBERAL ARTS

Bhattacharyya, Jnanabrata, Associate Professor, Ph.D., University of Delhi, India, 1969; 1968. Community development, comparative community development, international development, political theory and social and economic change, peasant movements.
Denise, Paul S., Assistant Professor, Ph.D., University of California, Berkeley, 1974; 1968. Community development, citizen participation, urban sociology, social change, race and ethnic relations, social stratification, experiential education, and social impact of energy development.
Klasek, Charles B., Professor, Ph.D., University of Nebraska, 1971; 1971. Instructional radio and TV, satellite communication, international education, international development practice.
Miller, Harry G., Professor, Ed.D., University of Nebraska, 1970; 1970.
Perk, H.F.W., Lecturer, A.B., University of California, Los Angeles, 1951; 1964. Alternative futures, design science, general systems research and methodology.
Poston, Richard W., Professor, *Emeritus,* B.A., University of Montana, 1940; 1953.

Computer Science

COLLEGE OF SCIENCE

Chu, Jiang-Hsing, Assistant Professor, Ph.D., University of Maryland, 1989; 1989. Analysis and design of computer algorithms, data structures, storage and retrieval algorithms, computer graphics and artificial intelligence.
Crawford, Albert, Assistant Professor, Ed.D., Oklahoma State University, 1970; 1987. Programming languages, functional programming, software engineering.
Danhof, K. J., Professor, Ph.D., Purdue University, 1969; 1969. Analysis and complexity of computer algorithms, combinatorics, logic programming.
Dinsmore, J. D., Assistant Professor, Ph.D., University of California, 1979; 1984. Artificial intelligence, natural language processing, programming languages.
Gupta, Bidyut, Assistant Professor, Ph.D., University of Calcutta, 1986; 1988. Fault-tolerant computing, VLSI design, graph theory, computer networks.
Hou, Wen-Chi, Assistant Professor, Ph.D., Case Western Reserve University, 1989; 1989. Statistical, real-time databases, query optimization.
Koschmann, Timothy D., Assistant Professor, Ph.D., Illinois Institute of Technology, 1987; 1988. Artificial intelligence, knowledge representation, expert systems.
Mark, Abraham M., Professor, *Emeritus,* Ph.D., Cornell University, 1947; 1950.
McGlinn, R. J., Associate Professor, Ph.D., Southern Illinois University at Carbondale, 1976; 1981. Microcomputers, data structures, file organization, computer science education, data base management, computer managed instruction.
Phillips, Nicholas C.K., Associate Professor, Ph.D., University of Natal, 1967; 1988. Theoretical computer science, language constructs, automatic data type generation, scheduling of multiprocessors.
Srimani, P. K., Professor, University of Calcutta, 1978; 1984. Fault-tolerant computing, heuristic search, application of graph theory, data structures, analysis of algorithms.
Varol, Y. L., Professor and *Chair,* Ph.D., University of Wyoming, 1971; 1978. Analysis and design of computing algorithms, data structures, information processing, discrete simulation, distributed databases.
Wainer, Michael S., Assistant Professor, Ph.D., University of Alabama, 1987; 1988. Computer graphics, parallel processing, cellular automata, self-organizing systems.
Wallis, W. D., Professor, Ph.D., University of Sydney, 1968; 1986. Combinatorics and graph theory, cryptography, optimization, complexity, programming languages.
Wright, W. E., Professor, D.Sc., Washington University, 1972; 1970. File organization, data structures, database management.
Zargham, M. R., Associate Professor, Ph.D., Michigan State University, 1983; 1983. Computer networks, computer architecture, petri nets, VLSI.

Curriculum and Instruction

COLLEGE OF EDUCATION

Aikman, Arthur L., Professor, Ph.D., Southern Illinois University at Carbondale, 1965; 1964.
Alston, Melvin O., Professor, *Emeritus,* Ed.D., Columbia University, 1945; 1970.
Barrette, Pierre P., Associate Professor, Ed.D, University of Massachusetts, 1971; 1978.
Bauner, Ruth E., Associate Professor, Ph.D., Southern Illinois University at Carbondale, 1978; 1956.
Becker, Jerry P., Professor, Ph.D., Stanford University, 1979; 1967.
Bedient, Douglas, Professor, Ph.D., Southern Illinois University at Carbondale, 1971; 1969.
Boykin, Arsene O., Associate Professor, *Emeritus,* Ed.D., University of Illinois, 1964; 1972.
Bradfield, Luther E., Professor, *Emeritus,* Ed.D., Indiana University, 1953; 1955.
Butts, Gordon K., Professor, *Emeritus,* Ed.D., Indiana University, 1956; 1950.
Campbell, James A., Assistant Professor, Ph.D., Ohio State University, 1978; 1989.
Casey, John P., Professor, *Emeritus,* Ed.D., Indiana University, 1963; 1964.
Copenhaver, Ron, Associate Professor, Ed.D., Indiana University, 1979; 1978.

Coscarelli, William, Professor, Ph.D., Indiana University, 1977; 1986.
Cox, Dorothy, Assistant Professor, Ph.D., Southern Illinois University at Carbondale, 1976; 1965.
Dale, Doris C., Professor, D.L.S., Columbia University, 1968; 1969.
Dixon, Billy G., Associate Professor and *Chair,* Ph.D., Southern Illinois University at Carbondale, 1967; 1961.
Eddleman, E. Jacqueline, Associate Professor, Ph.D., Southern Illinois University at Carbondale, 1970; 1969.
Erickson, Lawrence, Professor, Ph.D., University of Wisconsin, 1972; 1984.
Fletcher, Kathleen G., Associate Professor, *Emerita,* M.S., University of Illinois, 1947; 1955.
Gulley, Beverly, Associate Professor, Ph.D., Southern Illinois University at Carbondale, 1974; 1975.
Hill, Margaret K., Professor, *Emerita,* Ed.D., Boston University, 1948; 1965.
Hungerford, Harold R., Professor, Ph.D., Southern Illinois University at Carbondale, 1970; 1965.
Jacko, Carol, Associate Professor, Ph.D., University of Pittsburgh, 1974; 1975.
Jackson, James, Associate Professor, Ph.D., University of Wisconsin, 1976; 1976.
Jackson, Michael, Associate Professor, Ed.D., University of Florida, 1971; 1971.
Jones, Dan R., Associate Professor, Ed.D., Indiana University, 1978; 1978.
Karmos, Ann, Associate Professor, Ph.D., Southern Illinois University at Carbondale, 1975; 1975.
Killian, Joyce, Associate Professor, Ph.D., Pennsylvania State University, 1980; 1981.
Klasek, Charles B., Professor, Ph.D., University of Nebraska, 1971; 1971.
Lacey, Jerome, Assistant Professor, Ph.D., Southern Illinois University at Carbondale, 1975; 1976.
Lamb, Morris L., Associate Professor, Ed.D., University of Oklahoma, 1970; 1970.
Leming, James, Professor, Ph.D., University of Wisconsin, 1973; 1977.
Lindberg, Dormalee H., Professor, Ed.D., University of Missouri-Columbia, 1969; 1969.
Malone, Willis E., Professor, *Emeritus,* Ph.D., Ohio State University, 1950; 1939.
Matthias, Margaret, Associate Professor, Ph.D., Southern Illinois University at Carbondale, 1972; 1969.
McIntyre, D. John, Associate Professor, E.D., Syracuse University, 1977; 1977.
Mees, John D., Professor, *Emeritus,* Ed.D., Indiana University, 1950; 1946.
Moore, Eryn E., Assistant Professor, *Emerita,* Ph.D., Southern Illinois University at Carbondale, 1976; 1968.
Nelson, Joann N., Assistant Professor, *Emerita,* Ph.D., University of Illinois, 1980; 1982.
Norris, William, Associate Professor, Ed.D., Indiana University, 1973; 1977.
Paige, Donald D., Professor, Ed.D., Indiana University, 1966; 1966.
Pape, Sharon L., Assistant Professor, Ph.D., Ohio State University, 1988; 1988.
Pearlman, Susan F., Assistant Professor, Ph.D., University of Missouri-Columbia, 1987; 1989.
Post, Donna M., Assistant Professor, Ed.D., Pennsylvania State University, 1990; 1990.
Pultorak, Edward G., Assistant Professor, Ph.D., Indiana University, 1988; 1988.
Quisenberry, James D., Associate Professor, Ph.D., Indiana University, 1972; 1971.
Quisenberry, Nancy L., Professor, Ed.D., Indiana University, 1971; 1971.
Randolph, Victor, Professor, *Emeritus,* Ph.D., George Peabody College for Teachers, 1942; 1933.
Samford, Clarence, Professor, *Emeritus,* Ph.D., New York University, 1940; 1951.
Seiferth, Berniece B., Professor, *Emerita,* Ed.D., University of Missouri, 1955; 1955.
Shepherd, Terry R., Associate Professor, Ph.D., University of Illinois, 1971; 1971.
Shrock, Sharon A., Associate Professor, Ph.D., Indiana University, 1978; 1984.
Sloan, Fred A., Professor, Ed.D., George Peabody College for Teachers, 1959; 1968.
Smith, Lynn C., Associate Professor, Ph.D., University of Georgia, 1984; 1984.
Solliday, Michael, Associate Professor, Ph.D., Southern Illinois University at Carbondale, 1975; 1967.
Spigle, Irving S., Associate Professor, *Emeritus,* Ed.D., Indiana University, 1955; 1970.
Waggoner, Jan E., Assistant Professor, Ed.D., Memphis State University, 1990; 1990.
Wendt, Paul R., Professor, *Emeritus,* Ph.D., University of Minnesota, 1948; 1955.
Wise, Kevin C., Assistant Professor, Ed.D., University of Georgia, 1983; 1986.

Economics

COLLEGE OF LIBERAL ARTS

Chung, Heetaik, Assistant Professor, Ph.D., University of Minnesota, 1990; 1990. Macroeconomics, econometrics, monetary theory.
Ellis, Robert J., Jr., Associate Professor, Ph.D., University of Virginia, 1966; 1962. Labor economics.
Edelman, Milton, Professor, Ph.D., *Emeritus,* University of Illinois, 1951; 1950.
Fare, Rolf, Professor, Docent, University of Lund, Sweden, 1976; 1978. Microeconomic theory, mathematical economics.
Foran, Terry G., Associate Professor, Ph.D., Pennsylvania State University, 1970; 1969. Labor economics, monetary theory.
Grabowski, Richard, Associate Professor, Ph.D., University of Utah, 1977; 1979. Economic development, international economics.
Grosskopf, Shawna, Associate Professor, Ph.D., Syracuse University, 1977; 1977. Public finance, labor economics.
Hickman, C. Addison, Professor, *Emeritus,* Vandeveer Chair of Economics, Ph.D., University of Iowa, 1942; 1960.
Kandil, Magda, Assistant Professor, Ph.D., Washington State University, 1988; 1988. Macroeconomic theory, econometrics-time series analysis.
Kim, Yoonbai, Assistant Professor, Ph.D., Stanford University, 1986; 1985. International finance and open economy macroeconomics, econometrics, macroeconomics.

Laumas, G. S., Professor and *Chair,* Ph.D., Wayne State University, 1966; 1990. Macroeconomics, monetary economics.
Layer, Robert G., Professor, Ph.D., *Emeritus,* Harvard University, 1952; 1955.
Mitchell, Thomas M., Assistant Professor, Ph.D., Brown University, 1985; 1983. Microeconomic theory; international trade.
Myers, John G., Professor, Ph.D., Columbia University, 1961; 1977. Energy and environmental economics, macroeconomics, econometrics.
Norris, Mary, Assistant Professor, Ph.D., University of Maryland, 1985; 1985. International trade; economic development.
Primont, Daniel, Professor, Ph.D., University of California, Santa Barbara, 1970; 1978. Microeconomic theory, mathematical economics, econometrics.
Sawyer, Carl, Assistant Professor, Ph.D., University of Michigan, 1986; 1985. Resource economics, microeconomics theory.
Sharma, Subhash C., Assistant Professor, Ph.D., University of Kentucky, 1983; 1983. Econometrics, statistics.
Shields, Michael P., Associate Professor, Ph.D., University of Utah, 1975; 1975. Economic development; economic theory.
Takayama, Akira, Professor, Vandeveer Chair of Economics, Ph.D., University of Rochester, 1962; 1982. International economics, macroeconomics, mathematics, microeconomics.
Trescott, Paul B., Professor, Ph.D., Princeton University, 1954; 1976. Monetary theory, economic development.

Educational Administration and Higher Education

COLLEGE OF EDUCATION

Adams, Frank C., Professor, *Emeritus,* Ph.D., Southern Illinois University at Carbondale, 1962; 1957.
Aper, Jeffrey P., Assistant Professor, Ph.D., Virginia Tech., 1989; 1990.
Bach, Jacob O., Professor, *Emeritus,* Ph.D., University of Wisconsin, 1951; 1951.
Bracewell, George, Professor, *Emeritus,* Ed.D., Washington University, 1952; 1931.
Brammell, Paris R., Professor, *Emeritus,* Ph.D., University of Washington, 1930; 1960.
Bryant, Roye R., Professor, *Emeritus,* Ed.D., Washington University, 1952; 1948.
Buser, Robert L., Professor, Ed.D., Indiana University, 1966; 1967.
Casebeer, Arthur L., Professor, Ed.D., Oregon State University, 1963; 1969.
Clark, Elmer J., Professor, *Emeritus,* Ph.D., University of Michigan, 1949; 1964.
Davis, I. Clark, Professor, *Emeritus,* Ed.D., Indiana University, 1956; 1949.
Dennis, Lawrence J., Professor, Ph.D., Southern Illinois University at Carbondale, 1968; 1968.
Duff, Grace, Assistant Professor, *Emerita,* Ph.D., Southern Illinois University at Carbondale, 1970; 1973.
Eaton, William E., Professor and *Chair,* Ph.D., Washington University, 1971; 1971.
Evans, John, Associate Professor, Ph.D., Southern Illinois University at Carbondale, 1968; 1970.
Fishback, Woodson W., Associate Professor, *Emeritus,* Ph.D., University of Chicago, 1947; 1948.
Goldman, Samuel, Professor, Ph.D., University of Chicago, 1961; 1980.
Graham, Jack W., Professor, Ph.D., Purdue University, 1951; 1951.
Hall, James H., Associate Professor, *Emeritus,* Ed.D., George Washington University, 1950; 1952.
Hawley, John B., Professor, *Emeritus,* Ph.D., University of Michigan, 1957; 1965.
Jacobs, Robert, Professor, *Emeritus,* Ed.D., Wayne State University, 1949; 1962.
Jung, Loren B., Professor, *Emeritus,* Ph.D., Southern Illinois University at Carbondale, 1969; 1965.
Kaiser, Dale E., Professor, *Emeritus,* Ph.D., University of Illinois, 1963; 1966.
Keene, Roland, Professor, *Emeritus,* Ed.D., Washington University, 1962; 1958.
Keim, Marybelle C., Assistant Professor, Ph.D., Michigan State University, 1972; 1986.
King, John E., Professor, *Emeritus,* Ph.D., Cornell University, 1941; 1967.
Lean, Arthur E., Professor, *Emeritus,* Ph.D., University of Michigan, 1948; 1957.
Loucks, Hazel, Assistant Professor, Ph.D., St. Louis University, 1987; 1989.
Matthias, William, Associate Professor, *Emeritus,* Ed.D., University of Illinois, 1964; 1971.
McKenzie, William R., Professor, *Emeritus,* Ed.D., University of Denver, 1952; 1964.
Merwin, Bruce W., Professor, *Emeritus,* Ph.D., University of Kansas, 1929; 1927.
Miller, Harry G., Professor, Ed.D., University of Nebraska, 1970; 1970.
Moore, Malvin E., Professor, *Emeritus,* Ed. D., George Peabody College for Teachers, 1959; 1968.
Morrill, Paul H., Professor, *Emeritus,* Ph.D., Northwestern University, 1956; 1964.
Neal, Charles D., Professor, *Emeritus,* Ed.D., Indiana University, 1948; 1948.
Pettit, Lawrence K., Professor, Ph.D., University of Wisconsin, 1965; 1986.
Sasse, Edward B., Professor, Ph.D., University of Wisconsin, 1966; 1966.
Shelton, William E., Associate Professor, *Emeritus,* Ph.D., University of Chicago, 1950: 1951.
Spees, Emil R., Associate Professor, Ph.D., Claremont Graduate School, 1969; 1969.
Stuck, Dean, Professor, Ph.D., Iowa State University, 1968; 1968.
Tolle, Donald J., Professor, *Emeritus,* Ed.D., Florida State University, 1957; 1967.
Verduin, John R., Jr., Professor, Ph.D., Michigan State University, 1962; 1967.
Wohlwend, Herbert W., Associate Professor, *Emeritus,* Ph.D., Southern Illinois University at Carbondale, 1964; 1958.

Educational Psychology

COLLEGE OF EDUCATION

Altekruse, Michael K., Professor, Ed.D., Indiana University, 1967; 1967.
Bardo, Harold R., Associate Professor, Ph.D., Southern Illinois University at Carbondale, 1972; 1968.

Beggs, Donald L., Professor, Ph.D., University of Iowa, 1966; 1966.
Bradley, Richard W., Professor, Ph.D., University of Wisconsin, 1968; 1968.
Brown, Beverly, Associate Professor, Ph.D., University of Iowa, 1974: 1974.
Cody, John J., Professor and *Chair,* Ph.D., University of Wisconsin, 1961; 1965.
Daniels, M. Harry, Associate Professor, Ph.D., University of Iowa, 1978; 1978.
Deichmann, John W., Associate Professor, Ph.D., St. Louis University, 1969; 1969.
DeWeese, Harold L., Professor, *Emeritus,* Ed.D., University of Illinois, 1959; 1959.
Dillon-Sumner, Ronna, Professor, Ph.D., University of California, Riverside, 1978; 1978.
Elmore, Patricia B., Professor, Ph.D., Southern Illinois University at Carbondale, 1970; 1967.
Kelly, Francis J., Professor, Ph.D., University of Texas, 1963; 1965.
Leitner, Dennis W., Associate Professor, Ph.D., University of Maryland, 1975; 1974.
Lewis, Ernest, Professor, Ph.D., Southern Illinois University at Carbondale, 1971; 1970.
Mouw, John T., Professor, Ed.D., University of South Dakota, 1968; 1968.
Pohlmann, John T., Professor, Ph.D., Southern Illinois University at Carbondale, 1972; 1971.
Prichard, Karen K., Associate Professor, Ph.D., Kent State University, 1980; 1980.
Renzaglia, Guy A., Professor, *Emeritus,* Ph.D., University of Minnesota, 1952; 1955.
Snowman, Jack, Professor, Ph.D., Indiana University, 1975; 1975.
White, Gordon, Assistant Professor, Ph.D., University of Iowa, 1969; 1971.
White, Lyle, Assistant Professor, Ph.D., University of Iowa, 1988; 1989.
Woehlke, Paula L., Associate Professor, Ph.D., Arizona State University, 1973; 1973.
Yates, J. W., Professor, *Emeritus,* Ed.D., University of Missouri-Columbia, 1951; 1964.

Electrical Engineering

COLLEGE OF ENGINEERING AND TECHNOLOGY

Botros, Nazeih M., Associate Professor, Ph.D., University of Oklahoma, 1985; 1985. Digital hardware design, digital instrumentation, neural networks, robot sensing, bioeengineering.
Brown, David P., Professor, Ph.D., Michigan State University, 1961; 1983. Active network theory, circuit and system theory, graph theory, matrix theory, large scale networks and systems, signal processing.
Daneshdoost, Morteza, Associate Professor, Ph.D., Drexel University, 1984; 1984. Electric power systems, linear systems and circuits, control systems optimization techniques, expert systems, computer graphics, MMI.
Dhali, Shirshak K., Associate Professor, Ph.D., Texas Tech University, 1984; 1984. Plasma processing, gaseous electronics, lasers, superconductors.
Feiste, Vernold, K., Associate Professor, Ph.D., University of Missouri-Columbia, 1966; 1966. Electric power systems, electrical machines, electric power distribution, distribution automation.
Galanos, Glafkos D., Professor and *Chair,* Ph.D., University of Manchester, England, 1970; 1987. Power systems, HVDC transmission, power electronics systems.
Goben, Charles A., Professor, Ph.D., Iowa State University, 1965; 1980. Physical electronics, surface and interface properties, nuclear and space radiation effects, integrated optics, fiber optics, optical, infrared and microwave surface wave properties.
Gupta, Lalit, Associate Professor, Ph.D., Southern Methodist University, 1986; 1986. Computer vision, neural networks, digital signal processing.
Harackiewicz, Frances J., Assistant Professor, Ph.D., University of Massachusetts-Amherst, 1990; 1989. Microwave and milimeter wave antennas, phased arrays, radar cross sections, isotropic materials, electromagnetics.
Hu, Chia-Lun John, Professor, Ph.D., University of Colorado, 1966; 1981. Microwave and EM fields, nonlinear and parametic systems, bioengineering, electro-optics, air pollution.
Manzoul, Mahmoud A., Assistant Professor, Ph.D., West Virginia University, 1985; 1985. Computer architecture, special purpose computers, parallel and array processing, mulitple-valued logic.
Pourboghrat, Farzad, Associate Professor, Ph.D., University of Iowa, 1984; 1984. Systems control, robust and adaptive control, robotics, motion planning and self-organization, neural networks and learning systems.
Rawlings, Charles A., Associate Professor, Ph.D., Southern Illinois University at Carbondale, 1974; 1964. Biomedical engineering, clinical engineering, instrumentation, electronics.
Sayeh, Mohammad R., Assistant Professor, Ph.D., Oklahoma State University, 1985; 1986. Neural networks, optical computing, image processing, stochastic modeling, quantum electronics.
Schoen, Alan, Professor, Ph.D., University of Illinois, 1958; 1973. Computational geometry, optimization, tiling theory, theory of polyhedra, elementary number theory, minimal surfaces.
Smith, James G., Professor, Ph.D., University of Missouri-Rolla, 1967; 1966. Electromagnetics, antennas, electromagnetic properties of materials, application to lightning protection and mining.
Thomopoulos, Stelios C. A., Associate Professor, Ph.D., State University of New York at Buffalo, 1983; 1983. Communications, data networks, estimation and detection theory, adaptive control, neural networks, robotics, computer vision.
Viswanathan, Ramanarayanan, Associate Professor, Ph.D., Southern Methodist University, 1983; 1983. Detection and estimation theory, spread spectrum communication, communication theory, signal processing.

English

COLLEGE OF LIBERAL ARTS

Appleby, Bruce C., Professor, Ph.D., University of Iowa, 1967; 1967.
Benziger, James G., Professor, *Emeritus,* Ph.D., Princeton University, 1941; 1950.
Blakesley, David, Assisant Professor, Ph.D., University of Southern California, 1989; 1989.

Boyd, Timothy W., Assistant Professor, Ph.D., Princeton University, 1987; 1987.
Brown, William J., Associate Professor, Ph.D., Duke University, 1966; 1966.
Collins, K. K., Associate Professor, Ph.D., Vanderbilt University, 1976; 1976.
Donow, Herbert S., Professor, Ph.D., University of Iowa, 1966; 1966.
Friend, Jewell, Professor, *Emerita,* Ph.D., Southern Illinois University at Carbondale, 1970; 1967.
Goodin, George V., Associate Professor, Ph.D., University of Illinois, 1962; 1966.
Griffin, Robert P., Associate Professor, *Emeritus,* Ph.D., University of Connecticut, 1965; 1965.
Hatton, Thomas J., Associate Professor, Ph.D., University of Nebraska, 1966; 1965.
Hawes, Clement, Assistant Professor, Ph.D., Yale University, 1986; 1990.
Hillegas, Mark, Professor, *Emeritus,* Ph.D., Columbia University, 1957; 1965.
Howell, John M., Professor, Ph.D., Tulane University, 1963; 1963.
Hurley, Paul J., Professor, *Emeritus,* Ph.D., Duke University, 1962; 1965.
Jones, Rodney G., Professor, M.F.A., University of North Carolina at Greensboro, 1973; 1984.
Kiefer, Daniel R., Assistant Professor, Ph.D., Yale University, 1985; 1983.
Krappe, Edith S., Associate Professor, *Emerita,* Ph.D., University of Pennsylvania, 1953; 1929.
Kvernes, David M., Assistant Professor, Ph.D., University of Minnesota, 1967; 1968.
Lamb, Mary A., Associate Professor, Ph.D., Columbia University, 1975; 1975.
Lawson, Richard A., Associate Professor, Ph.D., Tulane University, 1966; 1963.
Light, James F., Professor, *Emeritus,* Ph.D., Syracuse University, 1953; 1979.
Little, Judy R., Professor, Ph.D., University of Nebraska, 1969; 1969.
McClure, Lisa J., Assistant Professor, D.A., University of Michigan, 1988; 1988.
Morey, Ann-Janine, Associate Professor, Ph.D., University of Southern California, 1979; 1989.
Moss, Sidney P., Professor, *Emeritus,* Ph.D., University of Illinois, 1954; 1964.
Nelms, Ralph G., Assistant Professor, Ph.D., Ohio State University, 1990; 1990.
Partlow, Robert B., Jr., Professor, *Emeritus,* Ph.D., Harvard University, 1955; 1957.
Person, Leland S., Jr., Professor and *Director of Graduate Studies,* Ph.D., University of Indiana, 1977; 1987.
Peterson, Richard F., Professor and *Chair,* Ph.D., Kent State University, 1969; 1969.
Piper, Henry Dan, Professor, *Emeritus,* Ph.D., University of Pennsylvania, 1950; 1962.
Rainbow, R.S., Associate Professor, *Emeritus,* Ph.D., University of Chicago, 1959; 1949.
Riedinger, Anita R., Assistant Professor, Ph.D., New York University, 1985; 1989.
Rudnick, Hans H., Professor, Ph.D., University of Freiburg, Germany, 1966; 1966.
Russo, James Richard, Associate Professor, Ph.D., University of Arizona, 1979; 1986.
Schonhorn, Manuel R., Professor, Ph.D., University of Pennsylvania, 1963; 1968.
Simeone, William E., Professor, *Emeritus,* Ph.D., University of Pennsylvania, 1950; 1950.
Stibitz, E. Earle, Professor, *Emeritus,* Ph.D., University of Michigan, 1951; 1952.
Vieth, David Muench, Professor, *Emeritus,* Ph.D., Yale University, 1953; 1965.
Webb, Howard W., Jr., Professor, *Emeritus,* Ph.D., University of Iowa, 1953; 1956.
Zimra, Clarisse, Assistant Professor, Ph.D., University of Washington, 1974; 1988.

Finance

COLLEGE OF BUSINESS AND ADMINISTRATION

Cornett, Marcia M., Associate Professor, Ph.D., Indiana University, 1983; 1990. Corporate finance and financial institutions and markets.
Davids, Lewis E., Professor, *Emeritus,* Ph.D., New York University, 1949; 1978.
Davidson, Wallace N., III, Professor, Ph.D., Ohio State University, 1982; 1989. Corporate finance.
Elsaid, Hussein H., Professor, Ph.D., University of Illinois, 1968; 1967. International finance and financial management.
Mathur, Iqbal, Professor and *Chair,* Ph.D., University of Cincinnati, 1974; 1977. Financial management and international finance.
Rangan, Nanda, Associate Professor, Ph.D., Texas A & M University, 1986; 1986. Financial institutions.
Rosenstein, Stuart N., Assistant Professor, Ph.D., University of Colorado, 1987; 1987. Investments and corporate finance.
Schwarz, Thomas V., Assistant Professor, D.B.A., Florida State University, 1984; 1988. Investments and speculative markets.
Szakmary, Andrew C., Assistant Professor, Ph.D., University of New Orleans, 1989; 1990. Corporate finance, international finance.
Tyler, R. Stanley, Associate Professor, J.D., University of Illinois, 1952; 1970. Business law, legal environment of business and real estate.
Vaughn, Donald E., Professor, Ph.D., University of Texas, 1961; 1970. Budgeting and investments.
Waters, Gola E., Professor, J.D., University of Iowa, 1957; Ph.D., Southern Illinois University at Carbondale, 1970; 1965. Business law and labor law.

Foreign Languages and Literatures

COLLEGE OF LIBERAL ARTS

Betz, Frederick, Professor, Ph.D., Indiana University, 1973; 1978.
Bork, Albert W., Professor, *Emeritus,* Doctor en Letras, National University of Mexico, 1944; 1958.
Canfield, D. Lincoln, *Emeritus,* Ph.D., Columbia University, 1934; 1970.
Cohen-Scali, Stella, Assistant Professor, Ph.D., Florida State University, 1988; 1988.
Davis, J. Cary, Professor, *Emeritus,* Ph.D., University of Chicago, 1936; 1930.
Gobert, David L., Professor, Ph.D., University of Iowa, 1960; 1965.
Hartman, Steven Lee, Associate Professor, Ph.D., University of Wisconsin, 1971; 1971.

Hartwig, Hellmut A., Professor, *Emeritus,* Ph.D., University of Illinois, 1943; 1948.
Keller, Thomas, Associate Professor, Ph.D., University of Colorado, 1975; 1975.
Kilker, James, Professor, *Emeritus,* Ph.D., University of Missouri-Columbia, 1961; 1967.
Kim, Alan, Assistant Professor, Ph.D., University of Southern California, 1985; 1988.
Leal-McBride, Maria-Odilia, Assistant Professor, Ph.D., University of Texas at Austin, 1981; 1988.
Liedloff, Helmut, Professor, Ph.D., Phillips University, Germany, 1956; 1959.
Meinhardt, Warren, Associate Professor, Ph.D., University of California, Berkeley, 1965; 1969.
O'Brien, Joan, Professor, Ph.D., Fordham University, 1961; 1969.
Orechwa, Olga, Associate Professor, *Emerita,* Ph.D., Universitas Ucrainiensis Libera, Munich, Germany, 1967; 1970.
Speck, Charles, Assistant Professor, Laurea in Diritto Canonico, Pontifical Lateran University, Italy, 1963; 1970.
Timpe, Eugene F., Professor, Ph.D., University of Southern California, 1960; 1972.
Ulner, Arnold R., Assistant Professor, Ph.D., University of Missouri, 1972; 1970.
Williams, Frederick, Associate Professor, Ph.D., Cornell, 1976; 1977.
Winters, Margaret, Associate Professor and *Chair,* Ph.D., University of Pennsylvania, 1975; 1977.
Woodbridge, Hensley, Professor, Ph.D., University of Illinois, 1950; 1965.

Forestry

COLLEGE OF AGRICULTURE

Aubertin, Gerald M., Associate Professor, Ph.D., Pennsylvania State University, 1964; 1976.
Budelsky, Carl A., Assistant Professor, Ph.D., University of Arizona 1969; 1967.
Burde, John H. II, Associate Professor, Ph.D., University of Arizona, 1974; 1974.
Chilman, Kenneth C., Associate Professor, Ph.D., University of Michigan, 1972; 1973.
Fralish, James S., Associate Professor, Ph.D., University of Wisconsin, 1970; 1969.
Gaffney, Gerald R., Assistant Professor, Ph.D., Southern Illinois University at Carbondale, 1970; 1969.
Kung, Fan H., Professor, Ph.D., Michigan State University, 1968; 1970.
McCurdy, Dwight R., Professor and *Chair,* Ph.D., Ohio State University, 1964; 1965.
Myers, Charles C., Associate Professor, Ph.D., Purdue University, 1966; 1973.
Phelps, John E., Associate Professor, Ph.D., University of Missouri, 1980; 1990.
Roth, Paul L., Professor, Ph.D., Kansas State University, 1968; 1967.

Geography

COLLEGE OF LIBERAL ARTS

Arey, David G., Associate Professor, Ph.D., Clark University, 1969; 1971.
Baumann, Duane D., Professor, Ph.D., Clark University, 1968; 1967.
Beazley, Ronald I., Professor, *Emeritus,* Ph.D., Purdue University, 1954; 1959.
Christensen, David E., Professor, *Emeritus,* Ph.D., University of Chicago, 1956; 1961.
Dziegielewski, Benedykt, Assistant Professor, Ph.D., Southern Illinois University at Carbondale, 1983; 1985.
Horsley, A. Doyne, Assistant Professor, Ph.D., Southern Illinois University at Carbondale, 1974; 1968.
Irwin, Daniel R., Associate Professor, Ph.D., Syracuse University, 1972; 1959.
Jones, David L., Professor, *Emeritus,* Ph.D., Pennsylvania State University, 1960; 1965.
Krause, Annemarie, Associate Professor, *Emerita,* Ph.D., University of Chicago, 1952; 1930.
Lant, Christopher L., Assistant Professor, Ph.D., University of Iowa, 1988; 1988.
Lieber, Stanley R., Professor, Ph.D., University of Iowa, 1974; 1975.
Sharpe, David M., Professor and *Chair,* Ph.D., Southern Illinois University at Carbondale, 1968; 1966.

Geology

COLLEGE OF SCIENCE

Berry, Margaret E., Assistant Professor, Ph.D., University of Colorado, 1990; 1990. Soils, geomorphology, quaternary geology.
Crelling, John C., Professor, Ph.D., Pennsylvania State University, 1973; 1977. Coal petrology, coal geology, coal utilization.
Dutcher, Russell R., Professor and *Dean* of the College of Science, Ph.D., Pennsylvania State University, 1960; 1970. Coal geology, field geology, coal petrology.
Esling, Steven P., Associate Professor, Ph.D., University of Iowa, 1984; 1982. Quaternary stratigraphy; hydrogeology; geomathematics.
Fifarek, Richard H., Assistant Professor, Ph.D., Oregon State University, 1985; 1985. Economic geology, stable isotope geochemistry; fluid inclusion studies.
Flanagan, Kathryn M., Assistant Professor, Ph.D., University of Wyoming, 1989; 1989. Field-oriented process of sedimentology, tectonics, clay sedimentology, vertebrate paleontology.
Frank, Charles, O., Assistant Professor, Ph.D., Syracuse University, 1973; 1970. Metamorphic petrology, igneous petrology.
Fraunfelter, George H., Professor, Ph.D., University of Missouri-Columbia, 1964; 1965. Stratigraphy, invertebrate paleontology, micropaleontology, field geology.
Harris, Stanley, E., Jr., Professor, *Emeritus,* Ph.D., University of Iowa, 1947; 1949.
Kruge, Michael A., Assistant Professor, Ph.D., University of California, Berkley, 1985; 1987. Molecular organic geochemistry, petroleum geology.
Marzolf, John E., Associate Professor, Ph.D., The University of California, Los Angeles, 1970; 1982. Clastic sedimentology, clastic petrology, sequence stratigraphy.
Ravat, Dhananjay N., Assistant Professor, Ph.D., Purdue University, 1989; 1991. Geophysics, gravity, magnetics, tectonics.

Ritter, Dale F., Professor, *Emeritus,* Ph.D., Princeton University, 1964; 1972.
Robinson, Paul D., Senior Geologist, M.S., Southern Illinois University at Carbondale, 1963; 1967. X-ray crystallography, electron microscopy/image analysis.
Sexton, John L., Associate Professor, Ph.D., Indiana University, 1974; 1985. Geophysics, seismic reflection and refraction.
Staub, James R., Associate Professor, Ph.D., University of South Carolina, 1985; 1988. Coal geology, basin analysis, geological engineering.
Utgaard, John E., Professor and *Chair,* Ph.D., Indiana University, 1963; 1965. Invertebrate paleontology, paleoecology; environments of deposition, carbonate petrology.
Zimmerman, Jay, Jr., Professor, Ph.D., Princeton University, 1968; 1973. Structural geology, rock deformation, alpine-type ultramafics.

Health Education

COLLEGE OF EDUCATION

Aaron, James E., Professor, *Emeritus,* Ed.D., New York University, 1960; 1957.
Boydston, Donald N., Professor, *Emeritus,* Ed.D., Columbia University, 1949; 1955.
Bridges, A. Frank, Professor, *Emeritus,* D.H.S., Indiana University, 1952; 1947.
Drolet, Judy C., Associate Professor, Ph.D., University of Oregon, 1982; 1982. Human sexuality, sexuality education, mental health, drug education, professional preparation, foundations of health education.
Grissom, Deward K., Professor, *Emeritus,* Ed.D., Columbia University, 1952; 1956.
Kittleson, Mark J., Assistant Professor, Ph.D., University of Akron, 1986; 1989. AIDS, health care workers' knowledge of HIV, stress management, research design, vital statistics, community health planning.
Lacey, Ella P., Associate Professor, Ph.D., Southern Illinois University at Carbondale, 1979; 1979. Pica, adolescent pregnancy, physicians' health promotion behavior, patient education.
LeFevre, John R., Professor, *Emeritus,* Ed.D., Teachers College, Columbia University, 1950; 1955.
Phillips, Frances K., Associate Professor, *Emerita,* M.A., Columbia University, 1940; 1944.
Richardson, Charles E., Professor, Ed.D., University of California, Los Angeles, 1959; 1954. Prematurity, sexuality, health care planning, patient education, attitudes toward aging and the aged.
Ritzel, Dale O., Professor and *Chair,* Ph.D., Southern Illinois University at Carbondale, 1970; 1966. Injury control, industrial health and safety, computer applications, research design.
Russell, Robert D., Professor, Ed.D., Stanford University, 1954; 1965. Positive holistic health, multicultural and ecological perspectives, human/spiritual interacting, death education, philosopies of health and health education, qualitative research, non-traditional thinking in health.
Sarvela, Paul D., Associate Professor, Ph.D., University of Michigan, 1984; 1986. Program evaluation, community health and epidemiology, needs assessment and strategic planning.
Sliepcevich, Elena M., Professor, D.P.E., Springfield College, 1955; 1973. Conceptual frameworks for health and health education, curriculum design, research methods, graduate professional preparation, future directions.
Vitello, Elaine M., Professor, Ph.D., Southern Illinois University at Carbondale, 1977; 1977. Community health, content analysis, health care services, health care advertising and marketing, professional preparation.
Welshimer, Kathleen J., Assistant Professor, Ph.D., University of North Carolina at Chapel Hill, 1990; 1990. Community organizing, pregnancy and women's health, stress and social support, social-psychological and anthropological perspectives, decision making, and perceived health risk.
Zunich, Eileen M., Assistant Professor, Ph.D., Southern Illinois University at Carbondale, 1970; 1967. School and community health education, program development, content areas-women's health, gerontology, consumer health, human development, emotional health.

History

COLLEGE OF LIBERAL ARTS

Allen, Howard W., Professor, Ph.D., University of Washington, 1959; 1962. United States: 20th Century; social science history.
Ammon, Harry, Professor, *Emeritus,* Ph.D., University of Virginia, 1948; 1950.
Barton, H. Arnold, Professor, Ph. D., Princeton University, 1962; 1970. European: 18th Century; France; Scandinavia; American immigration.
Batinski, Michael C., Associate Professor, Ph.D., Northwestern University, 1969; 1968. United States: colonial; early republic; social science history.
Carr, Kathryn J., Assistant Professor, Ph.D., University of Chicago, 1987; 1989. U.S. Social; 19th Century; Illinois.
Carrott, M. Browning, Associate Professor, Ph.D., Northwestern University, 1966; 1967. United States: constitutional and legal.
Clay, J. Eugene, Assistant Professor, Ph.D., 1989; 1990. Russian and Soviet History; Religion.
Conrad, David E., Professor, Ph.D., University of Oklahoma, 1962; 1967. United States: recent; American west; historic preservation.
Detwiler, Donald S., Professor, Dr. phil., Goettingen University, Germany, 1961; 1967. European-contemporary; Germany and Spain; historiography.
Dotson, John E., Assistant Professor and *Graduate Adviser,* Ph.D., Johns Hopkins University, 1969; 1970. European: Medieval and Renaissance, Italy; Maritime.
Fladeland, Betty L., Professor, *Emerita,* Ph.D., University of Michigan, 1952; 1962.
Gardiner, C. Harvey, Professor, *Emeritus,* Ph.D., University of Michigan, 1945; 1957.
Gold, Robert L., Professor, *Emeritus,* Ph.D., University of Iowa, 1964; 1965.
Haller, John S., Jr., Professor, Ph.D., University of Maryland, 1968; 1990. U.S. History, Intellectual; history of medicine and pharmacology.

Kuo, Ping-Chia, Professor, *Emeritus,* Ph.D., Harvard University, 1933; 1959.
Morgan, Marjorie L., Assistant Professor, Ph.D., Tulane University, 1988; 1988. European: England; social and cultural.
Murphy, James B., Associate Professor, Ph.D., Louisiana State University, 1968; 1968. United States: the South; Appalachia.
O'Day, Edward J., Assistant Professor, A.M., Indiana University, 1956; 1962. European: diplomatic; central Europe; Ireland; American immigration.
Shelby, Lon R., Professor, Ph.D., University of North Carolina, 1962; 1961. European: Medieval; Social.
Simon, John Y., Professor, Ph.D., Harvard University, 1961; 1964. United States: Civil War and Reconstruction; Illinois.
Thompson, Julius E., Assistant Professor, Ph.D., Princeton University, 1973; 1989. American and African-American History; modern Africa.
Vyverberg, Henry S., Professor, *Emeritus,* Ph.D., Harvard University, 1950; 1968.
Werlich, David P., Professor and *Chair,* Ph.D., University of Minnesota, 1968; 1968. Latin American: Andean region.
Wilson, David L., Associate Professor, Ph.D., University of Tennessee, 1974; 1974.;United States: diplomatic.
Wu, Tien-Wei, Professor, Ph.D., University of Maryland, 1965; 1972. Asian: East Asia; China.

Journalism

COLLEGE OF COMMUNICATIONS AND FINE ARTS

Akhavan-Majid Roya, Assistant Professor, University of Minnesota, 1988; 1988. Telecommunications policy, international communication.
Atwood, L. Erwin, Professor, Ph.D., University of Iowa, 1965; 1967. Political communication, international communication.
Brown, George C., Professor, *Emeritus,* Ph.D., Southern Illinois University at Carbondale, 1963; 1956.
Elliott, William R., Associate Professor, Ph.D., University of Wisconsin, 1972; 1987. Political communication, science communication.
Ford, James L. C., Professor, *Emeritus,* Ph.D., University of Minnesota, 1948; 1955.
Jaehnig, Walter B., Associate Professor and *Director,* Ph.D., University of Essex, England, 1972; 1987. Media ethics, media theory and philosophy, political violence reporting.
Johnson, Thomas J., Assistant Professor, Ph.D., University of Washington, 1989; 1988. Media history, political communication.
Kelly, James D., Assistant Professor, Ph.D., Indiana University, 1990; 1990. Visual communication, graphic design.
Lowry, Dennis T., Professor, Ph.D., University of Iowa, 1972; 1990. Mass communication theory, political communication.
McCoy, Ralph E., Professor, *Emeritus,* Ph.D., University of Illinois, 1956; 1955.
Paddon, Anna R., Assistant Professor, Ph.D., University of Tennessee, 1985; 1988. Mass communication education, mass communication history.
Ramaprasad, Jyotika, Assistant Professor, Ph.D., Southern Illinois University at Carbondale, 1984; 1986. International communication, mass media and social reality, international advertising.
Spellman, Robert, Associate Professor, J.D., Cleveland State University, 1977; 1985. Mass communication law, opinion privilege, media ethics.
Stonecipher, Harry W., Professor, *Emeritus,* Ph.D., Southern Illinois University at Carbondale, 1971; 1969.
Wanta, Wayne, Assistant Professor, Ph.D., University of Texas, 1989; 1989. Political communication (agenda setting), visual communication.

Library Affairs

Bauner, Ruth E., Associate Professor, Ph.D., Southern Illinois University at Carbondale, 1978; 1956.
Bedient, Douglas, Professor, Ph.D., Southern Illinois University at Carbondale, 1971; 1971.
Black, George W., Jr., Professor, *Emeritus,* M.S.L.S., Columbia University, 1966; 1968.
Boydston, Jo Ann, Distinguished Professor, Ph.D., Columbia University, 1950; 1955.
Brown, F. Dale, Associate Professor, Ph.D., Southern Illinois University at Carbondale, 1978; 1970.
Cook, Margaret Kathleen, Assistant Professor, Ph.D., Southern Illinois University at Carbondale, 1977; 1977.
Cox, Shelley M., Assistant Professor, M.A.L.S., University of Chicago, 1973; 1973.
Harwood, Judith A., Assistant Professor, Ph.D., Southern Illinois University at Carbondale, 1981; 1969.
Hostetler, Jerry, Assistant Professor, Ph.D., Southern Illinois University at Carbondale, 1977; 1968.
Matthews, Elizabeth W., Professor, Ph.D., Southern Illinois University at Carbondale, 1972; 1964.
Person, Roland C., Associate Professor, Ph.D., Southern Illinois University at Carbondale, 1982; 1970.
Peterson, Kenneth G., Professor and *Dean,* Ph.D., University of California, Berkeley, 1968; 1976.
Simon, John Y., Professor, Ph.D., Harvard University, 1961; 1964.
Stubbs, Walter R., Assistant Professor, Ph.D., Southern Illinois University at Carbondale, 1983; 1968.

Linguistics

COLLEGE OF LIBERAL ARTS

Angelis, Paul, Associate Professor and *Chair,* Ph.D., Georgetown University, 1968; 1981. Language testing, language teaching methodology, language acquisition.
Daesch, Richard, Assistant Professor, Ph.D., Southern Illinois University at Carbondale, 1986; 1966. Testing, evaluation, ESL program, administration.

Gilbert, Glenn G., Professor and *Chair,* Ph.D., Harvard University, 1963; 1970. Pidgin and creole languages, German, sociolinguistics, historical linguistics, dialectology, history of linguistics.
Kim, Alan, Assistant Professor, Ph.D., University of Southern California, 1985; 1988. Syntactic theory, functional syntax, semantics, comparative linguistics, Japanese and Korean syntax.
Lakshmanan, Usha, Assistant Professor, Ph.D., University of Michigan, 1989; 1990. First and second language acquisition, psycholinguistics, syntactic theory, tamil syntax.
Nathan, Geoffrey S., Associate Professor, Ph.D., University of Hawaii, 1978; 1980. Phonology, phonetics, cognitive grammar, syntax.
Nguyen, Dinh-Hoa, Professor, *Emeritus,* Ph.D., New York University, 1956; 1969.
Parish, Charles, Professor, Ph.D., University of New Mexico, 1959; 1965. EFL/ESL, pedagogy and methodology, materials-writing, innovative methods, syllabus design.
Perkins, Kyle, Professor, Ph.D., University of Michigan, 1976; 1976. Language testing, language teaching methodology, discourse theory and processing, the composing process, reading comprehension.
Redden, James E., Professor, Ph.D., Indiana University, 1965; 1967. EFL/ESL, field linguistics, African languages, Amerindian languages, phonetics.
Winer, Lise, Assistant Professor, Ph.D., University of the West Indies, 1982; 1986. EFL/ ESL methodology, composition, reading, creole studies, sociolinguistics.
Winters, Margaret E., Associate Professor, Ph.D., University of Pennsylvania, 1975; 1977. Historical linguistics, Romance comparative linguistics, syntax/semantics, cognitive grammar.
Young, Richard F., Assistant Professor, Ph.D., University of Pennsylvania, 1989; 1990. Second language acquisition, TESOL methodology, curriculum design, interlanguage variation, computer-assisted language learning, Italian, Cantonese, Mandarin.

Management

COLLEGE OF BUSINESS AND ADMINISTRATION

Bateman, David N., Professor, Ph.D., Southern Illinois University at Carbondale, 1970; 1965. Management and communication systems.
Bedwell, R. Ralph, Associate Professor, *Emeritus,* Ph.D., Southern Illinois University at Carbondale, 1969; 1954.
Fohr, John M., Professor, *Emeritus,* Ed.D., Michigan State University, 1959; 1962.
Gutteridge, Thomas G., Professor and *Dean,* Ph.D., Purdue University, 1971; 1983. Labor relations, personnel administration, and career development.
Larson, Lars L., Associate Professor, Ph.D., University of Illinois, 1971; 1971. Organizational behavior and business policy.
McKinley, William, Associate Professor, Ph.D., Columbia University, 1983; 1990. Organization theory, organizational behavior, strategic management.
Melcher, Arlyn J., Professor and *Chair,* Ph.D., University of Chicago, 1964; 1989. Organization theory, strategic management, research methodology.
Ramaprasad, Arkalgud, Associate Professor, Ph.D., University of Pittsburgh, 1980; 1980. Strategic management, management information systems.
Scott, John W., Professor, *Emeritus,* Ph.D., University of Chicago, 1930; 1947.
Sekaran, Uma, Professor, Ph.D., U.C.L.A., 1977; 1977. Organization behavior, cross-cultural perspectives in organization behavior, and research methods.
Tadisina, Suresh K., Assistant Professor, Ph.D., University of Cincinnati, 1987; 1986. Operations management and management sciences.
Troutt, Marvin D., Associate Professor, Ph.D., University of Illinois at Chicago, 1975; 1976. Mathematical programming, modeling of systems, optimization theory.
Vicars, William M., Associate Professor, Ph.D., Southern Illinois University at Carbondale, 1969; 1961. Personnel, management consulting.
White, Gregory P., Associate Professor, Ph.D., University of Cincinnati, 1976; 1978. Production management and management sciences.
Wilson, Harold K., Associate Professor, D.B.A., University of Colorado, 1972; 1972. Business policy, management and small business management.

Marketing

COLLEGE OF BUSINESS AND ADMINISTRATION

Adams, Kendall A., Professor, Ph.D., Michigan State University, 1962; 1965. Marketing management and industrial marketing.
Andersen, R. Clifton, Professor and *Chair,* D.B.A., Indiana University, 1960;. 1967. Marketing management and marketing channels.
Anderson, Carol H., Associate Professor, Ph.D., Texas A & M University, 1980; 1979. Retail management, marketing research, and marketing management.
Bruner, Gordon C., II, Associate Professor, Ph.D., University of North Texas, 1983; 1984. Consumer decision making, and promotion management.
Dommermuth, William P., Professor, *Emeritus,* Ph.D., Northwestern University, 1964; 1968.
Fraedrich, John P., Assistant Professor, Ph.D., Texas A&M University, 1988; 1987. Ethics, international marketing, and industrial sales.
Hensel, Paul J., Associate Professor, Ph.D., University of Houston, 1981; 1986. Marketing theory, consumer behavior, and advertising.
Hindersman, Charles H., Professor, D.B.A., Indiana University, 1959; 1960. Marketing management, business and society, and sales management.
King, Maryon F., Assistant Professor, Ph.D., Indiana University, 1989; 1988. Marketing management, consumer behavior, promotions management.
Moore, James R., Assistant Professor, *Emeritus,* Ph.D., University of Illinois, 1972; 1969.

Perry, Donald L., Associate Professor, Ph.D., University of Illinois, 1966; 1964. Social marketing, management, and sales management.
Summey, John H., Associate Professor, Ph.D., Arizona State University, 1974; 1978. Marketing management, marketing research, product strategy.

Mathematics

COLLEGE OF SCIENCE

Allison, Dean E., Assistant Professor, Ph.D., University of Missouri-Columbia, 1985; 1985. Differential geometry, lorentzian geometry, general relativity.
Beintema, Mark, Assistant Professor, Ph.D., University of South Carolina, 1990; 1990. Commutative algebra and combinatorics.
Burton, Theodore A., Professor, Ph.D., Washington State University, 1964; 1966. Differential equations: ordinary, delay, functional, volterra, partial; mathematical biology; applied mathematics.
Chen, Pei-Li, Assistant Professor, Ph.D., State University of New York at Buffalo, 1988; 1990. Nonlinear partial and ordinary differential equations, applied mathematics, mathematical biology, geometrical PDE.
Crenshaw, James A., Associate Professor, Ph.D., University of Illinois, 1967; 1967. Functional analysis, operations research, linear programming.
Danhof, Kenneth, Professor, Ph.D., Purdue University, 1969; 1969. Logic, combinatorics.
Dharmadhikari, Sudhakar, Professor, Ph.D., University of California, Berkeley, 1962; 1978. Statistics, sampling theory, probability, multivariate analysis.
Earnest, Andrew G., Associate Professor, Ph.D., Ohio State University, 1975; 1981. Algebra and algebraic number theory, arithmetic theory of quadratic forms.
Feinsilver, Philip, Professor, Ph.D., New York University (Courant), 1975; 1978. Probability theory, representation theory.
Fitzgerald, Robert W., Associate Professor, Ph.D., University of California-Los Angeles, 1980; 1982. Quadratic forms, algebra.
Foland, Neal E., Professor, Ph.D., University of Missouri, 1961; 1965. Topology, topological dynamics.
Gates, Leslie D., Associate Professor, *Emeritus,* Ph.D., Iowa State University, 1952; 1961.
Gregory, John, Professor, Ph.D., University of California, Los Angeles, 1969; 1972. Optimization theory, numerical analysis, applied functional analysis.
Grimmer, Ronald C., Professor, Ph.D., University of Iowa, 1967; 1967. Differential equations, integral equations, applied mathematics.
Hooker, John W., Professor, Ph.D., University of Oklahoma, 1967; 1967. Ordinary differential equations, difference equations.
Hughes, Harry R., Assistant Professor, Ph.D., Northwestern University, 1988; 1989. Stochastic processes, stochastic geometry.
Hunsaker, Worthen N., Associate Professor, Ph.D., Washington State University, 1966; 1969. General topology, quasi-uniform spaces, ordered topological spaces, frames.
Jeyaratnam, Sakthivel, Associate Professor, Ph.D., Colorado State University, 1978; 1981. Statistics, linear models, variance components, robust inference.
Kammler, David W., Professor, Ph.D., University of Michigan, 1971; 1971. Approximation theory, fourier analysis, numerical analysis, applications of mathematics.
Kirk, Ronald B., Professor, Ph.D., California Institute of Technology, 1968; 1968. Probability (markov processes, diffusions, martingales), functional analysis.
Koch, Charles, Assistant Professor, Ph.D., University of Illinois, 1961; 1966. Sequences, series, and summability.
Kuipers, Lauwerens, Professor, *Emeritus,* Ph.D., Vrije Universiteit (Amsterdam), 1947; 1966.
Langenhop, Carl E., Professor, *Emeritus,* Ph.D., Iowa State University, 1948; 1961.
Mark, Abraham M., Professor, *Emeritus,* Ph.D., Cornell University, 1947; 1950.
Maxwell, Charles, Professor, Ph.D., University of Illinois, 1955; 1963. Algebraic topology.
McDaniel, Wilbur C., Professor, *Emeritus,* Ph.D., University of Wisconsin, 1939; 1939.
Mohammed, Salah-Eldin A., Professor, Ph.D., University of Warwick, England, 1976; 1984. Functional differential equations, stochastic differential equations, global analysis.
Moore, Robert A., Associate Professor, *Emeritus,* Ph.D., Indiana University, 1961; 1965.
Neuman, Edward, Professor, Ph.D., University of Wroclaw, Poland, 1972; 1984. Numerical analysis, spline functions, approximation theory, special functions.
Olmsted, John M. H., Professor, *Emeritus,* Ph.D., Princeton University, 1940; 1960.
Paine, Thomas B., Assistant Professor, Ph.D., University of Oregon (Eugene), 1966; 1966. Limiting properties of rank order and permutation tests, probabilistic potential theory, stochastic integrals, geostatistics, martingales in infinite measure spaces, and weak maximal inequalities for infinitely divisible operators.
Panchapakesan, S., Professor, Ph.D., Purdue University, 1969; 1970. Multiple decision procedures, reliability, order statistics.
Parker, George D., Associate Professor, Ph.D., University of California at San Diego, 1971; 1972. Differential geometry, classical geometry, linear programming, computer modeling of coal industry and environmental legislation.
Patula, William T., Professor, Ph.D., Carnegie-Mellon University, 1971; 1972. Ordinary differential equations, difference equations.
Pedersen, Franklin D., Associate Professor, Ph.D., Tulane University, 1967; 1965. Algebra, semigroups, mathematics education.
Pedersen, Katherine, Associate Professor, Ph.D., Tulane University, 1969; 1965. Topology; mathematics education; research interests: statewide assessment in mathematics; gender and ethnic differences in mathematics performance.
Pericak-Spector, Kathleen A., Associate Professor, Ph.D., Carnegie-Mellon University, 1980; 1981. Hyperbolic partial differential equations, continuum mechanics, science education.

Porter, Thomas, Assistant Professor, Ph.D., University of New Mexico, 1990; 1990. Combinatorial analysis, graph theory.
Redmond, Donald, Associate Professor, Ph.D., University of Illinois, 1976; 1979. Analytic number theory, elementary number theory, classical analysis, history of mathematics.
Skalsky, Michael, Professor, *Emeritus,* D.Nat.Sc., University of Gottingen, 1949; 1957.
Snyder, Herbert H., Professor, *Emeritus,* Ph.D., Lehigh University, 1965; Ph.D., University of South Africa, 1971; 1966.
Spector, Scott J., Professor, Ph.D., Carnegie-Mellon University, 1978; 1981. Continuum mechanics, elasticity, nonlinear partial differential equations.
Tarabek, Michael A., Assistant Professor, Ph.D., Carnegie Mellon University, 1989; 1989. Partial differential equations.
Wallis, Walter D., Professor, Ph.D., University of Sydney, 1968; 1985. Combinatorics, neural networks.
Willis, Daniel G., Assistant Professor, Ph.D., University of Iowa, 1986; 1986. Numerical analysis, computational physics.
Wilson, Joseph C., Professor, *Emeritus,* Ph.D., Louisiana State University, 1954; 1957.
Wright, Mary H., Associate Professor, Ph.D., McGill University, Montreal, Quebec, 1977; 1980. Rings and modules: structure of modules, prime ideals and localization over serial rings with Krull dimension.
Yucas, Joseph, Associate Professor, Ph.D., Pennsylvania State University, 1978; 1980. Algebra, combinatorics.
Zeman, Marvin, Professor, Ph.D., New York University, 1974; 1979. Partial differential equations, integro-differential equations, numerical analysis.

Mechanical Engineering and Energy Processes

COLLEGE OF ENGINEERING AND TECHNOLOGY

Agrawal, Om, Associate Professor, Ph.D., University of Illinois-Chicago, 1984; 1985. CAD/Simulation of mechanical systems..
Chen, Juh W., Professor and *Dean,* Ph.D., University of Illinois, 1959; 1965. Coal conversion processes, supercritical extraction.
Chu, Tsuchin P., Assistant Professor, Ph.D., University of South Carolina, 1982; 1990. CAD/CAM, computer graphics, optical methods in experimental mechanics and manufacturing, image processing.
Don, Jarlen, Assistant Professor, Ph.D., Ohio State University, 1982; 1985. Composite materials, surface effects, carbon materials.
Farhang, Kambiz, Assistant Professor, Ph.D., Purdue University, 1989; 1990. CAD/CAM, kinematics, dynamics, control and stability of flexible and rigid-body mechanical, electromechanical, mechanical-drive systems; manufacturing processes and process control.
Helmer, Wayne A., Professor, Ph.D., Purdue University, 1974; 1974. Energy conservation, solar energy, direct contact heat transfer.
Hesketh, Howard E., Professor, Ph.D., Pennsylvania State University, 1968; 1968. Air pollution control, hazardous materials management, fluid bed combustion, material handling, engineering economics.
Hippo, Edwin J., Associate Professor, Ph.D., Pennsylvania State University, 1977; 1984. Coal liquefaction, coal conversion, chemical and physical cleaning of coal, coal structure, carbon materials, STM.
Jefferson, Thomas B., Professor, Ph.D., Purdue University, 1955; 1969. Heat transfer.
Kent, Albert C., Professor and *Chair,* Ph.D., Kansas State University, 1968; 1966. Energy conservation, solar, heat transfer.
Lalvani, Shashi B., Associate Professor, Ph.D., University of Connecticut, 1982; 1982. Electrochemical engineering, and coal cleaning and conversion.
Muchmore, Charles B., Professor, Ph.D., Southern Illinois University at Carbondale, 1969; 1966. Coal conversion and cleaning, alcohol production, water pollution control.
O'Brien, William S., Associate Professor, Ph.D., West Virginia University, 1972; 1973. Coal gasification and combustion, coal cleaning, carbon materials, mass transfer design, air and water pollution control.
Orthwein, William C., Professor, Ph.D., University of Michigan, 1958; 1965. Mechanical component simulation and design, vibrations, continuum mechanics.
Rajan, Suryanarayaniah, Professor, Ph.D., University of Illinois, 1970; 1977. Fluidized bed combustion, pulse combustion, engine fuels, combustion and pollution control.
Swisher, James H., Professor, Ph.D., Carnegie-Mellon, 1963; 1983. Corrosion and oxidation of alloys, pyrometallurgy, coal desulfurization.
Tempelmeyer, Kenneth E., Professor, Ph.D., University of Tennessee, 1969; 1979. Coal conversion, processing, and combustion, coal-fired MHD power generation and emissions control, MHD propulsion, noise and vibration control.
Wapner, Philip G., Associate Professor, Ph.D., University of Pennsylvania, 1970; 1983. Syngas cleaning, manufacture and characterization of carbon fibers and carbon/carbon composites.
Wittmer, Dale E., Associate Professor, Ph.D., University of Illinois, 1980; 1986. High temperature materials & testing, ceramics whisker synthesis, ceramic composites.
Wright, Maurice, Professor, Ph.D., University of Wales, United Kingdom, 1962; 1984. Fiber reinforced composites and fracture mechanics.

Microbiology

COLLEGE OF SCIENCE

Borgia, Peter, Associate Professor, Ph.D., (Springfield), University of Illinois, 1973; 1976.
Brewer, Gregory J., Associate Professor, Ph.D., (Springfield), University of California, San Diego, 1972; 1980.
Caster, John, Assistant Professor, Ph.D., St. Louis University, 1968; 1972.
Christianson, Thomas, Assistant Professor, Ph.D., University of Chicago, 1983; 1987.

Clark, David P., Associate Professor, Ph.D., University of Bristol, 1977; 1980.
Cooper, Morris D., Professor, Ph.D., (Springfield), University of Georgia, 1971; 1973.
Fix, Douglas F., Assistant Professor, Ph.D., Indiana University, 1983; 1987.
Gupta, Ramesh, Associate Professor, Ph.D., University of Illinois, 1981; 1984.
Jackson, Robert W., Professor, Ph.D., (Springfield), Purdue University, 1963; 1974.
Madigan, Michael T., Associate Professor, Ph.D., University of Wisconsin, 1976; 1979.
Maroun, Leonard, Associate Professor, Ph.D., (Springfield), Catholic University of America, 1970; 1972.
Martinko, John M., Associate Professor, Ph.D., SUNY (Buffalo), 1978; 1981.
McIntyre, John A., Associate Professor, Ph.D., (Springfield), Wake Forest University, 1971; 1982.
Moticka, Edward, Associate Professor, Ph.D., (Springfield), University of Illinois, 1970; 1978.
Myers, Walter L., Professor, Ph.D., (Springfield), University of Wisconsin, 1962; 1973.
Parker, Jack, Professor, Ph.D., Purdue University, 1973; 1977.
Rouhandeh, Hassan, Professor, Ph.D., Kansas State University, 1959; 1967.
Rowan, Dighton F., Professor, *Emeritus,* Ph.D., Stanford University, 1954; 1973.
Shechmeister, Isaac L., Professor, *Emeritus,* Ph.D., University of California, Berkeley, 1949; 1957.
Tewari, Ram P., Professor, Ph.D., (Springfield), Ohio State University, 1954; 1973.
Watabe, Kounosuke, Assistant Professor, Ph.D., Kyoto University, Japan, 1981; 1985.

Mining Engineering

COLLEGE OF ENGINEERING AND TECHNOLOGY

Caudle, Rodney D., Associate Professor, M.S., University of Illinois, 1952; 1981. Mining engineering, mine environmental control; rock mechanics, rock fragmentation.
Chugh, Yoginder P., Professor and *Chair,* Ph.D., The Pennsylvania State University, 1971; 1977. Rock mechanics and strata control, production engineering in coal mines, mine subsidence.
Paul, Bradley, Assistant Professor, Ph.D., University of Utah, 1989; 1990. Underground mining systems and solution mining, minerals processing, hard rock and industrial minerals, geostatistics.
Sevim, Hasan, Associate Professor, D.E.S., Columbia University, 1984; 1984. Mineral economics and operations research, materials handling, experimental design.
Sinha, Atmesh K., Professor, Ph.D., University of Sheffield, England, 1963; 1975. Coal processing, mine electrical engineering, mine health and safety.

Molecular Science

DEPARTMENTAL AFFILIATION OF INTERDISCIPLINARY PROGRAM FACULTY

Ali, Naushad, Associate Professor, Ph.D., (Physics).
Bausch, Mark J., Assistant Professor, Ph.D., (Chemistry and Biochemistry).
Bolen, D. Wayne, Professor, Ph.D., (Chemistry and Biochemistry).
Burton, Theodore A., Professor, Ph.D., (Mathematics).
Chavez, Daniel J., Associate Professor, Ph.D., (Anatomy).
Chen, Juh Wah, Professor and *Dean of Engineering and Technology,* Ph.D., (Mechanical Engineering and Energy Processes).
Coulson, Richard L., Professor, Ph.D., (Physiology).
Cutnell, John D., Professor, Ph.D., (Physics).
Dhali, Shirshak, Assistant Professor, Ph.D., (Electrical Engineering).
Englert, Duwayne C., Professor, Ph.D., (Zoology).
Evers, James L., Associate Professor, Ph.D., (Civil Engineering and Mechanics).
Goben, C., Professor, (Electrical Engineering).
Gregory, John, Professor, Ph.D., (Mathematics).
Gruber, Bruno J., Professor, Ph.D., (Physics).
Hart, Charles F., Assistant Professor, Ph.D., (Physics).
Henneberger, Walter C., Professor, Ph.D., (Physics).
Hinckley, Conrad C., Professor, Ph.D., (Chemistry and Biochemistry).
Hu, Chia L. J., Professor, Ph.D., (Electrical Engineering).
Hunter, William S., Associate Professor, Ph.D., (Physiology).
Johnson, Kenneth W., Associate Professor, Ph.D., (Physics).
Kammler, David W., Professor, Ph.D., (Mathematics).
Kent, Albert C., Professor, Ph.D., (Mechanical Engineering and Energy Processes).
Koster, David F., Professor, Ph.D., (Chemistry and Biochemistry).
Lalvani, Shashi B., Associate Professor, Ph.D., (Mechanical Engineering and Energy Processes).
Lewis-Bevan, Wyn, Assistant Professor, Ph.D., (Chemistry and Biochemistry).
Malhotra, Vivak, Associate Professor, Ph.D., (Physics).
Malik, F. Bary, Professor, Ph.D., (Physics).
Manzoul, Mahmoud A., Assistant Professor, Ph.D., (Electrical Engineering).
Masden, Joseph, Associate Professor, Ph.D., (Physics).
Meyers, Cal Y., Distinguished Professor, Ph.D., (Chemistry and Biochemistry).
Migone, Aldo D., Associate Professor, Ph.D., (Physics).
Muchmore, C., Professor, (Mechanical Engineering and Energy Processes).
Muhlach, William L., Assistant Professor, Ph.D., (Zoology).
O'Brien, William S., Associate Professor, Ph.D., (Mechanical Engineering and Energy Processes).
Rajan, S., Professor, Ph.D., (Mechanical Engineering and Energy Processes).
Sami, Sedat, Professor, Ph.D., (Civil Engineering and Mechanics).
Sanders, Frank C. Jr., Associate Professor and *Chair,* Ph.D., (Physics).
Saporoschenko, Mykola, Professor, Ph.D., (Physics).

Sayeh, Mohammad R., Assistant Professor, Ph.D., (Electrical Engineering).
Scheiner, Stephen, Professor, Ph.D., (Chemistry and Biochemistry).
Shanahan, Michael, Professor, Ph.D., (Physiology).
Shriver, John W., Associate Professor, Ph.D., (Chemistry and Biochemistry).
Sinha, Atmesh K., Associate Professor, Ph.D., (Mining Engineering).
Smith, Gerard V., Professor and *Director,* Ph.D., (Molecular Science and Chemistry and Biochemistry).
Smith, James G., Professor, Ph.D., (Electrical Engineering).
Swisher, James H., Professor, Ph.D., (Mechanical Engineering and Energy Processes).
Tao, Rongjia, Assistant Professor, Ph.D., (Physics).
Tyrrell, James, Professor, Ph.D., (Chemistry and Biochemistry).
Viswanathan, Ramanarayanan, Associate Professor, Ph.D., (Electrical Engineering).
Wittmer, Dale E., Associate Professor, Ph.D., (Mechanical Engineering and Energy Processes).
Yopp, John H., Professor and *Associate Vice President of Academic Affairs and Research and Dean of the Graduate School,* Ph.D., (Plant Biology).
Zitter, Robert N., Professor, Ph.D., (Physics).

Music

COLLEGE OF COMMUNICATIONS AND FINE ARTS

Allison, Robert, Associate Professor, D.M.A., University of Illinois, 1988; 1982. Trumpet, jazz.
Barta, Michael, Associate Professor, M.Mus., Liszt Academy Conservatory, 1975; 1985. Violin.
Barwick, Steven, Professor, *Emeritus,* Ph.D., Harvard University, 1949; 1955.
Bateman, Marianne Webb, Professor, M.Mus., University of Michigan, 1959; 1965. Organ, music theory.
Beattie, Donald, Associate Professor, M.Mus., University of Colorado, 1977; 1979. Class piano, piano pedagogy.
Best, Richard, Professor, Metropolitan Opera School, 1968; 1984. Voice.
Bottje, Will Gay, Professor, *Emeritus,* A.Mus.D., Eastman School of Music, 1955; 1957.
Breznikar, Joseph, Associate Professor, M.Mus., University of Akron, 1977; 1980. Classical guitar.
Delphin, Wilfred, Professor, D.M.A., University of Southern Mississippi, 1978; 1988. Piano.
Fligel, Charles, Associate Professor and *Undergraduate Advisor,* M.Mus., University of Kentucky, 1966; 1976. Bassoon, music literature.
Grizzell, Mary Jane, Assistant Professor, *Emerita,* M.Mus., Eastman School of Music, 1943; 1959.
Hanes, Michael D., Associate Professor, M.M.Ed., Southern Illinois University at Carbondale, 1965; 1970. Bands, musical theater, percussion.
House, Mary Elaine Wallace, Professor, *Emerita,* M. Mus., University of Illinois, 1954; 1969.
Hunt, C. B., Jr., Professor, *Emeritus,* Ph.D., University of California, Los Angeles, 1949; 1974.
Hussey, George, Professor, M.A.Ed., Washington University, 1963; 1963. Oboe, music appreciation.
Mandat, Eric, Associate Professor, D.M.A., Eastman School of Music, 1986; 1981. Clarinet, composition.
McHugh, Catherine, Professor, *Emerita,* Ed.D., Columbia University, 1959; 1969.
Mellado, Daniel, Associate Professor, Ph.D., Michigan State University, 1979; 1979. Cello.
Mochnick, John, Associate Professor, D.M.A., University of Cincinnati, 1978, 1984. Choral.
Mueller, Robert, Professor, *Emeritus,* Ph.D., Indiana University, 1964; 1948.
Olsson, Phillip, Professor, *Emeritus,* M.Mus., Chicago Conservatory, 1949; 1949.
Phillips, Dan, Assistant Professor, M.M., University of Notre Dame, 1979; 1988. Bands, horn.
Poulos, Helen, Associate Professor and *Graduate Coordinator,* D.M., Indiana University, 1971; 1969. Violin, musicology.
Resnick, Robert, Professor, *Emeritus,* M.Mus., Wichita State University, 1949; 1949.
Ritcher, Gary, Assistant Professor, Ed.D., University of Illinois, 1989; 1989. Music education.
Romain, Edwin, Professor, D.M.A., University of Southern Mississippi, 1978; 1988. Piano.
Roubos, Robert, Professor and *Director,* D.M.A., University of Michigan, 1965; 1981.
Simmons, Margaret, Associate Professor, M.Mus., University of Illinois, 1976; 1977. Piano accompanying.
Stemper, Frank, Associate Professor, Ph.D., University of California, 1981; 1983. Composition.
Taylor, Charles, Associate Professor, *Emeritus,* Ed.D., Columbia University, 1950; 1957.
Tomasz, Melanie, Assistant Professor, M.Mus., Northwestern University, 1973; 1983. Voice.
Underwood, Jervis, Professor, Ph.D., North Texas State University, 1970; 1971. Flute, musicology.
Wagner, Jeanine, Assistant Professor, D.M.A., University of Illinois, 1987; 1984. Voice.
Weiss, Robert, Associate Professor and *Assistant Director,* Ph.D., Southern Illinois University at Carbondale, 1984; 1978. Music education, trombone.
Werner, Kent, Associate Professor, *Emeritus,* Ph.D., University of Iowa, 1966; 1963. Piano, music theory.

Pharmacology

SCHOOL OF MEDICINE

Becker, Robert E., Professor, M.D., (Springfield), McGill University, Canada, 1960; 1983. Neurochemistry/neuropharmacology and biochemical pharmacology.
Browning, Ronald A., Associate Professor, Ph.D., University of Illinois Medical Center, Chicago, 1971; 1973. Pharmacology, neuropharmacology.
Caspary, Donald, Associate Professor, Ph.D., (Springfield), New York University, 1971; 1973. Sensory physiology, neurophysiology, neuroanatomy, comparative physiology.

Cline, William H., Professor, Ph.D., (Springfield), West Virginia University, 1965; 1974. Cardiovascular physiology and pathophysiology, coronary circulation, myocardial metabolism.
Dunaway, George, Associate Professor, Ph.D., (Springfield), University of Oklahoma, 1970; 1975. Regulation of energy/metabolism during diabetes; development and aging; induction of experimental ulcers in rats.
Faingold, Carl L., Professor, Ph.D., (Springfield), Northwestern University, 1970; 1972. Convulsive seizure mechanisms and effects of anticonvulsants; pharmacological alterations of cerebral evoked potentials.
Giacobini, Ezio, Professor, Ph.D., M.D., (Springfield), Karolinska Institute of Medicine, (Stockholm, Sweden), 1953; 1959; 1983. Neuropharmacology of Alzheimer's disease, development and aging of cholinergic synapses.
Lee, Tony, Professor, Ph.D., (Springfield), West Virginia University, 1973; 1975. Neuromuscular transmission in cerebral blood vessels.
Peterson, Rudolph, Professor, Ph.D., University of Florida, Gainesville, 1965; 1976. Role of plasma membrane of sperm-egg adhesion; plasma membrane transport, mechanism of synthesis of plasma membrane proteins; relation of the cytoskeleton to plasma membrane function.
Rybak, Leonard, Associate Professor, Ph.D., (Springfield), University of Minnesota, 1979; 1981. Investigation of mechanisms controlling ionic composition and resting potentials in the peripheral auditory apparatus using chinchilla model.
Somani, Satu, Professor, Ph.D., (Springfield), Liverpool University, England, 1969; 1976. Drug disposition.

Philosophy

COLLEGE OF LIBERAL ARTS

Alexander, Thomas, Assistant Professor, Ph.D., Emory University, 1984; 1985. American philosophy, classical philosophy, aesthetics, Dewey.
Clarke, David S., Jr., Professor, Ph.D., Emory University, 1964; 1966. Philosophy of language, logic.
Diefenbeck, James A., Professor, *Emeritus,* Ph.D., Harvard University, 1950; 1950.
Eames, Elizabeth R., Professor, *Emerita,* Ph.D., Bryn Mawr College, 1951; 1963.
Gatens-Robinson, Eugenie, Assistant Professor, Ph.D., Southern Illinois University at Carbondale, 1983; 1974. History and philosophy of science, epistemology, feminism.
Gillan, Garth J., Professor, Ph.D., Duquesne University, 1966; 1969. Critical theory, continental philosophy.
Hahn, Lewis E., Research Professor, *Emeritus,* Ph.D., University of California, 1939; 1963.
Hahn, Robert, Associate Professor, Yale University, 1976; 1982. Greek philosophy, philosophy and history of science, Kant.
Hayward, John, Professor, *Emeritus,* Ph.D., University of Chicago, 1949; 1968.
Howie, John, Professor, Ph.D., Boston University, 1965; 1966. Philosophy of religion, ethics, American idealism.
Johnson, Mark, Professor, Ph.D., University of Chicago, 1977; 1977. Philosophy of language, aesthetics, ethics, Kant studies.
Kelly, Matthew J., Associate Professor and *Chair,* Ph.D., University of Notre Dame, 1963; 1966. Medieval philosophy, Greek philosophy, metaphysics.
King, Sallie B., Associate Professor, Ph.D., Temple University, 1981; 1983. Asian philosophy, cross-cultural philosophy, philosophy of religion.
McClure, George T., Professor, *Emeritus,* Ph.D., Ohio State University, 1958; 1958.
Moore, Willis, Professor, *Emeritus,* Ph.D., University of California, 1936; 1955.
Plochmann, George Kimball, Professor, *Emeritus,* Ph.D., University of Chicago, 1950; 1949.
Schedler, George, Professor, Ph.D., University of California, San Diego, 1973; 1973. Philosophy of law, ethics, social philosophy.
Schilpp, Paul A., Professor, *Emeritus,* Ph.D., Stanford University, 1936; 1965.
Summerfield, Donna M., Assistant Professor, Ph.D., University of Notre Dame, 1984; 1990. Wittgenstein, epistemology, analytic philosophy.
Tyman, Stephen, Associate Professor, Ph.D., University of Toronto, 1980; 1980. Eighteenth and 19th century European philosophy, phenomenology, existentialism.

Physical Education

COLLEGE OF EDUCATION

Ackerman, Kenneth, Assistant Professor, M.A., Michigan State University, 1959; 1969. Exercise physiology.
Baker, John A. W., Associate Professor, Ph.D., University of Iowa, 1979; 1980. Administration and curriculum.
Becque, M. Daniel, Assistant Professor, Ph.D., University of Michigan, 1988; 1990. Exercise physiology.
Blinde, Elaine M., Assistant Professor, Ph.D., University of Illinois, 1987; 1987. Social-psychology of sport.
Brechtelsbauer, Kay, Assistant Professor, Ph.D., Southern Illinois University at Carbondale, 1980; 1965. Motor behavior.
Carroll, Peter, Assistant Professor, Ph.D., Pennsylvania State University, 1970; 1969. Aquatics.
DeVita, Paul, Assistant Professor, Ph.D., University of Oregon, 1986; 1986. Biomechanics.
Good, Larry, Associate Professor, Ed.D., Temple University, 1968; 1967. Kinesiology.
Kelley, Betty C., Assistant Professor, Ph.D., 1990; 1990. Sport psychology.
Knowlton, Ronald, Professor and *Chair,* Ph.D., University of Illinois, 1961; 1961. Exercise physiology.
Martin, Janis H., Assistant Professor, Ed.D., University of Tennessee, 1982; 1987. Motor development.
Potter, Marjorie Bond, Professor, *Emerita,* Ph.D., University of Southern California, 1958; 1961.
Shea, Edward, Professor, *Emeritus,* Ph.D., New York University, 1955; 1954.
Stotlar, John, Associate Professor, *Emeritus,* D.P.Ed., Indiana University, 1954; 1948.

Thorpe, JoAnne Lee, Professor, *Emerita,* Ph.D., Texas Woman's University, 1964; 1958.
West, Charlotte, Professor, Ph.D., University of Wisconsin, 1969; 1957. Administration.
Wilson, Donna, Assistant Professor, M.F.A., University of Oklahoma, 1975; 1987. Dance.
Zimmerman, Helen, Professor, *Emerita,* Ph.D., University of Wisconsin, 1951; 1952.

Physics

COLLEGE OF SCIENCE

Ali, Naushad, Assistant Professor, Ph.D., University of Alberta, Canada, 1984; 1986.
Arvin, Martin J., Professor, *Emeritus,* Ph.D., University of Illinois, 1934; 1949.
Cutnell, John D., Professor, Ph.D., University of Wisconsin, 1967; 1968.
Gruber, Bruno J., Professor, Ph.D., University of Vienna, Austria, 1961; 1972.
Hart, Charles F., Assistant Professor, Ph.D., University of Texas, 1981; 1986.
Henneberger, Walter C., Professor, Ph.D., Gottingen University, Germany, 1959; 1963.
Johnson, Kenneth W., Associate Professor, Ph.D., Ohio State University, 1967; 1970.
Malhotra, Vivak, Assistant Professor, Ph.D., Kanpur University, India, 1978; 1984.
Malik, F. Bary, Professor, Ph.D., Gottingen University, 1958; 1980.
Masden, J. Thomas, Assistant Professor, Ph.D., Purdue University, 1983; 1984.
Migone, Aldo D., Assistant Professor, Ph.D., The Pennsylvania State University, 1984; 1986.
Nickell, William E., Professor, *Emeritus,* Ph.D., University of Iowa, 1954; 1963.
Sanders, Frank C., Jr., Associate Professor and *Chair,* Ph.D., University of Texas, 1968; 1969.
Saporoschenko, Mykola, Professor, Ph.D., Washington University, 1958; 1965.
Tao, Rongjia, Assistant Professor, Ph.D., Columbia University, 1982; 1989.
Watson, Richard E., Professor, *Emeritus,* Ph.D., University of Illinois, 1938; 1958.
Zitter, Robert N., Professor, Ph.D., University of Chicago, 1962; 1967.

Physiology

SCHOOL OF MEDICINE

Banerjee, Chandra, Professor, M.D., University of Calcutta, 1955, Ph.D., Medical College of Virginia, 1967; 1974. Pulmonary physiology, neonatal physiology.
Bartke, Andrzej, Professor and *Chair,* Ph.D., University of Kansas, 1965; 1984. Reproductive endocrinology; role of prolactin and growth hormone in the control of hypothalamic, pituitary and testcular function; transgenic animals, seasonal breeding.
Browning, Ronald A., Professor, Ph.D., University of Illinois Medical Center, Chicago, 1971; 1973. Pharmacology, neuropharmacology.
Coulson, L. Richard, Professor, Ph.D., University of Toronto, Canada, 1971; 1978. Cardiovascular physiology and pathophysiology, coronary circulation, myocardial metabolism.
Cox, Thomas C., Associate Professor, Ph.D., Arizona State University, 1979; 1982. Ion transport across epithelial tissue.
Dunagan, Tommy T., Professor, Ph.D., Purdue University, 1960; 1962. Physiology and biochemistry of Acanthocephala, carbohydrate metabolism, nervous system, lacunar system.
Ellert, Martha, Associate Professor, Ph.D., University of Miami, 1967; 1975. Properties of sulfhydryl reagent pCMBS; effects of material hyperthermia and rubella vaccine on pregnant animals and their offspring.
Falvo, Richard E., Professor, Ph.D., University of Wyoming, 1970; 1973. Sterodial control of gonadotropin secretion and immunological approaches to the study of male reproduction.
Ferraro, James S., Assistant Professor, Ph.D., The Chicago Medical School, 1984; 1987. Physiological, behavioral, and reproductive aspects of circadian rhythmicity; photoperiodic response of seasonal breeders; endogenous nature of biological rhythms during spaceflight.
Foote, Florence M., Professor, *Emerita,* Ph.D., University of Iowa, 1940; 1963.
Hunter, William S., Associate Professor, Ph.D., Michigan State University, 1971; 1975. Mechanism of fever and normal thermoregulation in homeothermic animals.
Kaplan, Harold M., Professor, *Emeritus,* Ph.D., Harvard University, 1933; 1949.
Miller, Donald M., Professor, Ph.D., University of Illinois, 1965; 1966. Comparative physiology and ciguatera toxins.
Myers, Hurley, Professor, Ph.D., University of Tennessee, 1969; 1971. Cardiovascular physiology, coronary occlusion; vascular smooth muscle hypertension.
Nequin, Lynn, Associate Professor, Ph.D., University of Illinois Medical Center, Chicago, 1970; 1976. Female reproductive physiology; environmental control of neuroendocrine systems and seasonal reproduction.
Peterson, Rudolph, Professor, Ph.D., University of Florida, Gainesville, 1965; 1976. Role of plasma membrane of sperm-egg adhesion; plasma membrane transport, mechanism of synthesis of plasma membrane proteins; relation of the cytoskeleton to plasma membrane function.
Russell, Lonnie D., Professor, Ph.D., University of Nebraska, 1974; 1977. Male reproduction system, hormonal control of spermatogenesis; Sertoli cell function; functional morphology of the testis; fertilization.
Shanahan, Michael F., Professor, Ph.D., University of Michigan, 1976; 1985. Insulin action and glucose transport across cell membranes.
Sollberger, Arne, Professor, *Emeritus,* M.D., Caroline Institute of Medicine and Dentistry, Sweden, 1957; 1972.
Steger, Richard W., Professor, Ph.D., University of Wyoming, 1974; 1985. Neuroendocrinology, gerontology, reproductive endocrinology.
Wade, David, Associate Professor, Ph.D., Cambridge University, 1967; 1974. Renal physiology, cell biology.
Yau, William M., Professor, Ph.D., Medical College of Virginia, 1971, 1973. Gastrointestinal physiology.

Plant Biology

COLLEGE OF SCIENCE

Ashby, William C., Professor, Ph.D., University of Chicago, 1950; 1960. Stripmine reclamation; forest ecology; tree growth; biomass production.

Bozzola, John J., Associate Professor, Ph.D., Southern Illinois University at Carbondale, 1975; 1983. Electron microscopy; cytology; microbiology.

Clark, Kathleen A., Assistant Professor, Ph.D., University of Kansas, 1983; 1987. Plant physiology; membrane transport; bioenergetics.

Crandall-Stotler, Barbara, Professor, Ph.D., University of Cincinnati, 1968; 1970. Developmental morphology; bryology; experimental studies; ultrastructure; phylogenesis.

Matten, Lawrence C., Professor and *Chair*, Ph.D., Cornell University, 1965; 1965. Paleobotany; Devonian-Mississippian plants; evolution of ferns, progymnosperms, and gymnosperms; early seeds.

Middleton, Beth A., Assistant Professor, Ph.D., Iowa State University, 1989; 1990. Wetland ecology; tropical ecology; herbivory.

Mohlenbrock, Robert H., Distinguished Professor, *Emeritus,* Ph.D., Washington University, 1957; 1957.

Nickrent, Daniel L., Assistant Professor, Ph.D., Miami University (Ohio), 1984; 1990. Plant systematics and molecular evolution; biology of parasitic flowering plants.

Olah, Ladislao V., Professor, *Emeritus,* Ph.D., Stephen Tisza University, Hungary, 1934; 1959.

Pappelis, Aristotel J., Professor, Ph.D., Iowa State University, 1957; 1960. Plant physiology; quantitative interference microscopy; quantitative cytochemistry and cytoflourescence; physiology of parasitism; cellular senescene; mutagenesis (radon; agricultural chemicals).

Richardson, John A., Associate Professor, M.F.A., Ohio University, 1969; 1969. Botanical photography.

Robertson, Philip A., Associate Professor, Ph.D., Colorado State University, 1968; 1970. Plant community ecology; dendrochronology.

Schmid, Walter E., Professor, Ph.D., University of Wisconsin, 1961; 1962. Plant physiology; absorption and translocation of micronutrient elements; physiology of tachyplants.

Stotler, Raymond E., Professor, Ph.D., University of Cincinnati, 1968; 1969. Bryology; systematics; botanical documentation.

Sundberg, Walter J., Professor, Ph.D., University of California at Davis, 1971; 1972. Mycology; cytology; systematics, ecology, and ultrastructure of fungi with emphasis on Basidiomycetes.

Tindall, Donald R., Professor, Ph.D., University of Louisville, 1966; 1966. Freshwater and marine phycology; algal development under natural and controlled conditions; aquatic ecology; algal toxins; natural products from algae.

Ugent, Donald, Professor, Ph.D., University of Wisconsin, 1966; 1968. Ethnobotany; taxonomy; biosystematics; phytogeography.

Verduin, Jacob, Professor, *Emeritus,* Ph.D., Iowa State University, 1947; 1964.

Yopp, John H., Professor, Ph.D., University of Louisville, 1969; 1970. Plant physiology; developmental plant physiology; environmental regulation of metabolic pathways.

Associate Faculty in Doctoral Program

Aubertin, R.	Forestry
Chong, S-K.	Plant and Soil Science
Elkins, D.M.	Plant and Soil Science
Fralish, J.	Forestry
Gaffney, J.	Forestry
Hillyer, I.G.	Plant and Soil Science
Kapusta, G.	Plant and Soil Science
Klubek, B.	Plant and Soil Science
Miller, D.M.	Physiology
Myers, O.	Plant and Soil Science
Olsen, F.	Plant and Soil Science
Preece, J.	Plant and Soil Science
Roth, P.	Forestry
Stucky, D.J.	Plant and Soil Science
Taylor, B.H.	Plant and Soil Science
Tweedy, J.A.	Plant and Soil Science
Van Sambeek, J.	U.S. Forest Service
Varsa, E.C.	Plant and Soil Science

Plant and Soil Science

COLLEGE OF AGRICULTURE

Chong, She-Kong, Professor, Ph.D., University of Hawaii, 1979; 1979. Soil physics.

Diesburg, Kenneth L., Assistant Professor, Ph.D., Iowa State University, 1987; 1989. Turfgrass science

Elkins, Donald M., Professor, Ph.D., Auburn University, 1967; 1967. Field and forage crops, plant growth regulators.

Gibson, Paul T., Assistant Professor, Ph.D., Iowa State University, 1981; 1989. Plant genetics and breeding and statistics.

Hillyer, Irvin G., Professor, Ph.D., Michigan State University, 1956; 1956. General horticulture and vegetable production.

Jones, Joe H., Professor, Ph.D., *Emeritus,* Ohio State University, 1960; 1964.

Kapusta, George, Professor, Ph.D., Southern Illinois University at Carbondale, 1975; 1964. Weed control and crop production.

Kjelgren, Roger K., Assistant Professor, Ph.D., University of Washington, 1988; 1988. Ornamental horticulture and water relationships.

Klubek, Brian P, Associate Professor, Ph.D., Utah State University, 1977; 1978. Soil microbiology.

Leasure, J. K., Professor, *Emeritus,* Ph.D., University of Illinois, 1953; 1966.

Midden, Karen L., Assistant Professor, M.L.A., University of Georgia, 1983; 1988. Landscape design.

Myers, Oval, Jr., Professor, Ph.D., Cornell University, 1963; 1968. Plant genetics and breeding.

Olsen, Farrel J., Professor, Ph.D., Rutgers University, 1961; 1971. Forages and pasture agronomy.

Portz, Herbert L., Professor, *Emeritus,* Ph.D., University of Illinois, 1954; 1954.

Preece, John E., Professor, Ph.D., University of Minnesota, 1980; 1980. Horticultural physiologist.

Starman, Terri W., Assistant Professor, Ph.D., Texas A & M University, 1986; 1986. Floriculture, post harvest physiology of ornamental crops.

Stucky, Donald J., Professor, Ph.D., Purdue University, 1963; 1970. Crop physiology, crop ecology, crop production and environmental aspects.

Taylor, Bradley H., Associate Professor, Ph.D., Ohio State University, 1982; 1982. Fruit production.

Tweedy, James A., Professor, Ph.D., Michigan State University, 1966; 1966. Herbicides and weed control.

Varsa, Edward C., Associate Professor, Ph.D., Michigan State University, 1970; 1970. Soil chemistry, fertility, and management.

Political Science

COLLEGE OF LIBERAL ARTS

Baker, John H., Associate Professor, Ph.D., Princeton University, 1961; 1966. American politics, urban politics, intergovernmental relations, local government.

Bhattacharyya, Jnanabrota, Associate Professor, Ph.D., University of Delhi, India, 1969; 1968. Political theory, international relations, public administration.

Chou, Ikua, Professor, *Emeritus,* Ph.D., Fletcher School of Law and Diplomacy, 1949; 1964.

Clinton, Robert L., Assistant Professor, Ph.D., University of Texas, 1985; 1985. Public law, American politics, public choice theory.

Dale, Richard, Associate Professor, Ph.D., Princeton University, 1962; 1966. African politics, comparative politics, international politics, and civil-military politics.

Derge, David Richard, Professor, Ph.D., Northwestern University, 1955; 1972. American politics, political parties, public opinion, administrative decision-making.

Desai, Uday, Associate Professor, Ph.D., University of Pittsburgh, 1973; 1978. Public administration, public policy, organizational theory.

Ervin, Osbin L., Associate Professor, Ph.D., University of Tennessee, 1974; 1974. Public administration, policy analysis, environmental and land-use policy, fiscal management.

Esler, Michael, Assistant Professor, Ph.D., Ohio State University, 1990; 1989. Public law, American government and politics, criminal justice.

Foster, John L., Associate Professor and *Chair,* Ph.D., University of Minnesota, 1971; 1975. Organizational behavior and theory, urban government, program evaluation, public policy.

Garner, William R., Associate Professor, Ph.D., Tulane University, 1963; 1966. Latin American politics, inter-American relations, political culture/socialization, political philosophy.

Hamman, John, Assistant Professor, Ph.D., University of Illinois, 1988; 1989. Public administration, public policy, american government and politics.

Hanson, Earl Thomas, Professor, *Emeritus,* Ph.D., University of Illinois, 1948; 1960.

Hardenbergh, William, Professor, *Emeritus,* Ph.D., University of Illinois, 1954; 1960.

Jackson, John S., III, Professor, Ph.D., Vanderbilt University, 1971; 1969. American government and politics, political parties, public opinion, state and local government.

Kamarasy, Egon K., Assistant Professor, *Emeritus,* Doctor Politics, Budapest University, Hungary, 1942; 1959.

Kenney, David T., Professor, *Emeritus* Ph.D., University of Illinois, 1952; 1951.

Klingberg, Frank L., Professor, *Emeritus,* Ph.D., University of Chicago, 1938; 1946.

Landecker, Manfred, Associate Professor, Ph.D., Johns Hopkins University, 1965; 1959. International relations, U.S. foreign policy, comparative politics and foreign policy, economic and political development.

Mason, Ronald M., Associate Professor, Ph.D., University of Iowa, 1976; 1976. Political theory and American politics, political participation.

McGrath, Robert A., Professor, *Emeritus,* Ph.D., University of Iowa, 1947; 1949.

Melone, Albert, Professor, Ph.D., University of Iowa, 1972; 1979. Public law and American politics.

Miller, Roy E., Associate Professor, Ph.D., University of Illinois, 1971; 1967. Methodology, American political behavior.

Morton, Ward M., Professor, *Emeritus,* Ph.D., University of Texas, 1941; 1949.

Nelson, Randall H., Professor, *Emeritus,* Ph.D., University of Michigan, 1956; 1955.

Paine, JoAnn P., Associate Professor, *Emeritus,* Ph.D., University of Oregon, 1967; 1966.

Schmidt, Diane, Assistant Professor, Ph.D., Washington University, 1988; 1988. American government, public policy, legislative behavior, public opinion, comparative politics.

Schubert, Glendon, Research Professor, Ph.D., Syracuse University, 1948; 1986. Biology and politics, political culture, political behavior.

Snavely, Keith, Associate Professor, Ph.D., University of California at Davis, 1984; 1984. Public administration; personnel management; state, local, and urban government.

Somit, Albert, Distinguished Service Professor, *Emeritus,* Ph.D., University of Chicago, 1947; 1980.

Stauber, Leland G., Associate Professor, Ph.D., Harvard University, 1964; 1966. Socialism, comparative public policy, comparative government and politics.

Turley, William S., Professor, Ph.D., University of Washington, 1972; 1971. International relations, comparative politics.

Psychology

COLLEGE OF LIBERAL ARTS

Brutten, Gene J., Professor, Ph.D., University of Illinois, 1957; 1957.

Buck, Terence D., Associate Professor, Ph.D., University of Missouri, 1968; 1969. Counseling, and psychotherapy, group process and group dynamics, management of psychological services.

Clancy, Stephanie, Assistant Professor, Ph.D., Syracuse University, 1989; 1989. Life-span development, cerebral asymmetrics, aging and cognition, skilled visual processing.

Corcoran, Kevin, Assistant Professor, Ph.D., University of Connecticut, 1984; 1988. Clinical, applications of social learning theory to addiction, parental adjustment to the handicapped child.

Cunningham, Jean, Associate Professor, Ph.D., University of Utah, 1981; 1981. Clinical, self-disclosure, human sexuality, sex-roles, psychological assessment.

DiLalla, David, Assistant Professor, Ph.D., University of California, 1989; 1990. Personality and psychopathology, developmental, behavioral genetics.

Dillon-Sumner, Ronna, Associate Professor, Ph.D., University of California, Riverside, 1978; 1978. Experimental human psychophysiology, cognitive assessment, life span, cognitive development.

Dollinger, Stephen, Professor, Ph.D., University of Missouri, 1977; 1977. Clinical, child and family therapy, applications of attribution theory.

Ehrenfreund, David, Professor, *Emeritus,* Ph.D., State University of Iowa, 1947; 1962.

Gannon, Linda, Professor, Ph.D., University of Wisconsin, 1975; 1975. Clinical, human psychophysiology, behavioral medicine, psychosomatic disorders, learned helplessness, feminist therapy.

Gilbert, Brenda O., Assitant Professor, Ph.D., University of Florida, 1985; 1986. Clinical, child behavior therapy, pediatric psychology, child behavior assessment.

Gilbert, David G., Associate Professor, Ph.D., Florida State University, 1978; 1985. Clinical, behavior therapy, marital research and therapy, behavioral medicine, smoking psychophysiology, personality, emotions.

Graham, Jack W., Professor, Ph.D., Purdue University, 1951; 1951. Counseling, measurement and evaluation.

Jensen, Robert, Associate Professor, Ph.D., Northern Illinois University, 1976; 1981. Biopsychology, psychopharmacology, developmental psychobiology.

Kelley, Noble, H., Professor, *Emeritus,* Ph.D., State University of Iowa, 1936; 1951.

Leong, Fred, Assistant Professor, Ph.D., University of Maryland, 1988; 1987. Counseling, career development, cross-cultural counseling, stress and coping, and organizational psychology.

Lit, Alfred, Professor, *Emeritus,* Ph.D., Columbia University, 1948; 1961.

McHose, James H., Professor and *Chair,* Ph.D., University of Iowa, 1961; 1961. Experimental, learning theory, motivation, animal learning.

McKillip, John A., Professor, Ph.D., Loyola University of Chicago, 1974; 1975. Experimental, counseling, program evaluation, need assessment, health promotion programming.

Meltzer, Donald, Professor, Ph.D., University of Pittsburgh, 1963; 1966. Experimental, learning instrumentation, psychopharmacology.

Mitchell, Thomas O., Associate Professor, Ph.D., University of Colorado, 1969; 1968. Experimental, social, psycholinguistics, person perception, computer simulation of social behavior, metatheory, psychology of situations.

Molfese, Dennis L., Professor, Ph.D., Pennsylvania State University, 1972; 1972. Experimental, developmental biopsychology, developmental neurolinguistics, psycholinguistics, cognition.

Molfese, Victoria J., Professor, Ph.D., Pennsylvania State University, 1974; 1972. Experimental, developmental biopsychology, cognition, aging, perinatal risk, infant behavioral and neuroelectrical assessments.

O'Donnell, James P., Associate Professor, Ph.D., University of Pittsburgh, 1965; 1965. Clinical, child psychopathology, clinical neuropsychology.

Pitz, Gordon F., Professor, Ph.D., Carnegie Institute of Technology, 1963; 1963. Experimental, decision making, cognitive processes and judgment.

Purcell, Thomas D., Associate Professor, Ph.D., Southern Illinois University at Carbondale, 1965; 1960. Personnel psychology.

Radtke, Robert C., Associate Professor, Ph.D., State University of Iowa, 1963; 1966. Experimental, memory, cognitive processes, aging.

Rafferty, Janet E., Professor, *Emerita,* Ph.D., Ohio State University, 1952; 1954.

Ramanaiah, Nerella, Professor, Ph.D., University of Oregon, 1971; 1971. Experimental, clinical personality assessment, test theory, quantitative methods.

Ringuette, Eugene L., Associate Professor, *Emeritus,* Ph.D., Purdue University, 1963; 1967.

Schill, Thomas R., Professor, Ph.D., Oklahoma State University, 1963; 1963. Clinical, personality theory and dynamics, personality evaluation, rational emotive psychotherapy.

Schmeck, Ronald R., Professor, Ph.D., Ohio University, 1969; 1969. Experimental, teaching methods, individual differences in learning, learning style, cognitive style.

Shea, Sandra, Assistant Professor, Ph.D., Vanderbilt University, 1980; 1988. Experimental vision, sensation, and perception.

Shoemaker, Donald J., Professor, *Emeritus,* Ph.D., Ohio State University, 1955; 1960.

Smith, Douglas C., Associate Professor, Ph.D., Kansas State University, 1977; 1979. Experimental, biopsychology, neurophysiology, vision, development, learning and memory.

Snyder, John F., Associate Professor, Ph.D., Loyola University, 1965; 1968. Counseling, crisis intervention, consultation, supervision, rural drug abuse prevention programming, counseling evaluation research.

Stockdale, Margaret, Assistant Professor, Ph.D., Kansas State University, 1990; 1990. Experimental, applied experimental, industrial/organizational, gender bias in personnel decisions.

Swanson, Jane L., Assistant Professor, Ph.D., University of Minnesota, 1986; 1986. Counseling, career choice and development, measurement of vocational interests, counselor training.

Tinsley, Diane J., Associate Professor, Ph.D., University of Minnesota, 1972; 1978. Counseling, assessment of training and supervision, women's career development, psychological measurement, leisure activities, personality.

Tinsley, Howard E.A., Professor, Ph.D., University of Minnesota, 1971; 1973. Counseling, career counseling, psychological measurement, leisure activities, personality.

Vaux, Alan, Associate Professor, Ph.D., Trinity College, 1979, Ph.D., University of California/Irvine, 1981; 1980. Clinical, community psychology, environmental psychology, behavioral analysis, intervention and theory, social support and stress.

Westberg, William C., Professor, *Emeritus,* Ph.D., Pennsylvania State University, 1948; 1952.
Yanico, Barbara, Associate Professor, Ph.D., Ohio State University, 1977; 1978. Counseling, psychology of women, sex roles, counseling theories, vocational development, employee relations.

Radio-Television

COLLEGE OF COMMUNICATIONS AND FINE ARTS

Birk, Thomas A., Assistant Professor, M.A., University of Nebraska, Omaha, 1990; 1990. Sales and management.
Dybvig, Homer E., Associate Professor, *Emeritus,* Ph.D., Southern Illinois University at Carbondale, 1970; 1961.
Foote, Joe S., Associate Professor and *Chair,* Ph.D., University of Texas at Austin, 1979; 1986. Political news and management.
Hildreth, Richard, Associate Professor, *Emeritus,* M.S., Syracuse University, 1968; 1968.
Hodgson, Scott, Assistant Professor, M.S., Southern Illinois University at Carbondale, 1990; 1988. Television producing and directing, corporate media production, documentary, field and studio production.
Johnson, Phylis W., Assistant Professor, M.A., Texas A & M University, 1985; 1990. Radio production.
Keller, Kenneth R., Assistant Professor, M.A., University of Illinois, 1966; 1984. Broadcast journalism, television news, broadcast reporting, documentary production, television field production.
Murrie, Michael, Assistant Professor, M.A., University of Missouri, Columbia, 1977; 1988. Television news performance, and new technology.
O'Neill, Patrick, Assistant Professor, Ph.D., Indiana University, 1990; 1989. Telecommunication policy.
Robbins, Buren C., Associate Professor, *Emeritus,* M.A., University of Iowa, 1935; 1949.
Shipley, Charles W., Professor, *Emeritus,* Ph.D., Florida State University, 1971; 1971.
Sitaram, K. S., Professor, Ph.D., University of Oregon, 1969; 1979. Social effects, new technology and intercultural communications.
Starr, Michael, Assistant Professor and *Director of Graduate Studies,* LLM, Georgetown University Law Center, 1966; 1988. Broadcast law and policy, promotion.

Recreation

COLLEGE OF EDUCATION

Allen, John R., Associate Professor and *Chair,* Ph.D., Southern Illinois University at Carbondale, 1978; 1978.
Glover, James, Assistant Professor, Ph.D., University of Maryland, 1980; 1989.
Glover, Regina, Associate Professor, Ph.D., University of Maryland, 1983; 1983.
Malkin, Marjorie, Assistant Professor, Ed.D., University of Georgia, 1986; 1989.
McEwen, Douglas, Professor, Ph.D., Michigan State University, 1973; 1975.
O'Brien, William, Professor, *Emeritus,* Re.D., Indiana University, 1967; 1948.
Sims, Steven, Assistant Professor, Ph.D., University of Oregon, 1986; 1986.
Taylor, Loren, Professor, *Emeritus,* Ed.D., Columbia University, 1957; 1957.
Teaff, Joseph D., Professor, Ed.D., Columbia University, 1973; 1980.

Rehabilitation Institute

COLLEGE OF EDUCATION

Allen, Harry A., Professor, Ed.D., University of Arkansas, 1971; 1970. Mental illness, psychosocial aspects of physical disabilities, counseling, death, and dying.
Austin, Gary F., Professor and *Director,* Ph.D., Northwestern University, 1973; 1984. Deafness rehabilitation; psychosocial aspects of disability.
Beck, Richard J., Assistant Professor, Ph.D., University of Wisconsin, 1987; 1990. Chronic pain, substance abuse, workers' compensation, and cross-cultural counseling.
Bender, Eleanor, Assistant Professor, *Emerita,* M.S., Southern Illinois University at Carbondale, 1972; 1961.
Benshoff, John J., Assistant Professor, Ph.D., University of Northern Colorado, 1987; 1988. Rehabilitation administration, private sector rehabilitation, substance abuse.
Bordieri, James E., Associate Professor, Ph.D., Illinois Institute of Technology, 1980; 1986. Vocational evaluation, rehabilitation administration, job placement, rehabilitation management.
Bryson, Seymour L., Professor, Ph.D., Southern Illinois University at Carbondale, 1972; 1969. Social, economic, and culturally different clients.
Crimando, William, Professor, Ph.D., Michigan State University, 1980; 1980. Job development and placement, computers in rehabilitation, adjustment services, staff training and development.
Cuvo, Anthony J., Professor, Ph.D., University of Connecticut, 1973; 1973. Behavior analysis and intervention in developmental disabilities, evaluation research, legal and ethical issues.
Dickey, Thomas W., Associate Professor, *Emeritus,* M.A., Southern Illinois University at Carbondale, 1964; 1964.
Falvo, Donna, Associate Professor, Ph.D., Southern Illinois University at Carbondale, 1978; 1974. Maintenance and support of the disabled.
Gardner, Margaret S., Associate Professor, *Emerita,* Ph.D., Northwestern University, 1960; 1968.
Greene, Brandon, Professor, Ph.D., Florida State University, 1979; 1979. Behavior analysis in consumer affairs; parent and staff training.
Grenfell, John E., Professor, Ed.D., Oregon State University, 1966; 1966. Corrections, substance abuse, disability law.
Hafer, Marilyn, Associate Professor, *Emerita,* Ph.D., Texas Tech University, 1971; 1979.
Hawley, Irene B., Assistant Professor, *Emerita,* Ph.D., Southern Illinois University at Carbondale, 1973; 1968.
Janikowski, Timothy P., Assistant Professor, Ph.D., University of Wisconsin-Madison, 1988; 1988. Assessment, credentialing, private for-profit rehabilitation, computers in rehabilitation.

Lee, Robert E., Associate Professor, *Emeritus,* Ph.D., University of Minnesota, 1964; 1964.
Poppen, Roger L., Professor, Ph.D., Stanford University, 1968; 1970. Stress reduction, relaxation, biofeedback, human operant conditioning.
Renzaglia, Guy A., Professor, *Emeritus,* Ph.D., University of Minnesota, 1952; 1955.
Riggar, Theodore, Professor, Ed.D., University of Northern Colorado, 1977; 1979. Rehabilitation administration, professional burnout.
Rubin, Harris B., Professor, Ph.D., University of Chicago, 1965; 1966. Sexual behavior, applied behavior analysis, treatment of incarcerated offenders, and prison reform.
Rubin, Stanford E., Professor, Ed.D., University of Illinois, 1968; 1980. Rehabilitation research, case management, history and philosophy of rehabilitation.
Schumacher, Brockman, Professor, Ph.D., Washington University, 1969; 1967. Mental illness, economic deprivation, counselor training, independent living.
Taricone, Patrick, Assistant Professor, Ph.D., University of Northern Colorado, 1984; 1986. Alcoholism and substance abuse treatment, counseling, and rehabilitation.
Vieceli, Louis, Associate Professor, *Emeritus,* M.S.Ed., Southern Illinois University at Carbondale, 1959; 1958.
Wright, W. Russell, Associate Professor, Ph.D., Southern Illinois University at Carbondale, 1974; 1971. Design and conduct of survey research and selected analysis.

Religious Studies

COLLEGE OF LIBERAL ARTS

Bengston, Dale R., Assistant Professor and *Chair,* Ph.D., Hartford Seminary Foundation, 1971; 1973.

Social Work

SCHOOL OF SOCIAL WORK

Auerbach, Arnold J., Professor, *Emeritus,* Ph.D., University of Pittsburgh, 1961; 1972.
Brown, Foster, S., Associate Professor, Ph.D., Southern Illinois University at Carbondale, 1978; 1969. Direct practice, ethnicity, field instruction, microcomputers.
Davidson, Mary E., Associate Professor and *Director,* Ph.D., Brandeis University, 1975; 1984. Social welfare policy, planning, advocacy research, child welfare, and human rights.
Lauber, Marilyn, Assistant Professor, D.S.W., University of Alabama, 1988; 1989. Human behavior and the social environment, aging, mental health.
Miah, Muhammad M.R., Assistant Professor, Ph.D., Southern Illinois University at Carbondale, 1985; 1985. Health/mental health, research, computers, ethnicity.
Newcomb, Paul R., Assistant Professor, Ph.D., Florida State University, 1986; 1986. Family and child welfare, micro practice, rural substance abuse, cohabitation.
Parker, Michael D., Assistant Professor and *Associate Director,* D.S.W., Arizona State University, 1986; 1986. Social welfare policy and planning, child welfare, macro practice.
Szabo, Alexander, Assistant Professor, Ed.D., Columbia University, 1990; 1990. Macro practice, health/mental health.

Sociology

COLLEGE OF LIBERAL ARTS

Alix, Ernest K., Associate Professor, Ph.D., Southern Illinois University at Carbondale, 1966; 1967. Deviant behavior, law and society, sociology of support.
Best, Joel, Professor and *Chair,* Ph.D., University of California at Berkeley, 1971; 1991. Deviance and social control, social problems, sociology of popular culture, history of crime.
Brinkley-Carter, Christina, Associate Professor, Ph.D., Princeton, 1977; 1989. Demography, research, education, formal organizations.
Brooks, Melvin, Associate Professor, *Emeritus,* Ph.D., University of Wisconsin, 1941; 1956.
Burger, Thomas, Associate Professor, Ph.D., Duke University, 1972; 1973. Theory, history of social thought, social stratification.
Eynon, Thomas G., Professor, Ph.D., Ohio State University, 1959; 1968. Crime/delinquency, criminal justice/corrections, social change, energy and society.
Hawkes, Roland K., Associate Professor, *Emeritus,* Ph.D., Johns Hopkins University, 1967; 1970.
Hendrix, Lewellyn, Associate Professor, Ph.D., Princeton University, 1974; 1971. Family and kinship, cross-cultural research.
Hope, Keith, Professor, Ph.D., London University, 1963; 1986. Statistics, social stratification and mobility, methods, political sociology.
Nall, Frank C., II, Associate Professor, Ph.D., Michigan State University, 1959; 1964. Urban culture, black culture, comparative race and ethnic relations.
Shalin, Dmitri N., Associate Professor, Ph.D., Institute of Sociology Research, USSR Academy of Sciences, 1973, Ph.D., Columbia University, 1990; 1982. Sociological theory, history of theory, comparative/political sociology.
Shelby, Lon R., Professor, Ph.D., University of North Carolina, 1962; 1969. Methods of historical sociology, history of social thought.
Snyder, Charles R., Professor, *Emeritus,* Ph.D., Yale University, 1954; 1960.
Taub, Diane E., Assistant Professor, Ph.D., University of Kentucky, 1986; 1987. Deviant behavior, medical sociology, social psychology.
Ward, Kathryn B., Associate Professor, Ph.D., University of Iowa, 1982; 1982. Social demography, women, cross-national studies.
Williams, Rhys H., Assistant Professor, Ph.D., University of Massachusetts, Amherst, 1988; 1989. Political sociology, culture, religion, theory.

Special Education

COLLEGE OF EDUCATION

Bates, Paul, Professor, Ph.D., University of Wisconsin, 1978; 1978.
Casey, John P., Professor, *Emeritus.* Ed.D., Indiana University, 1963; 1964.

Chandler, Lynette, Assistant Professor, Ph.D., University of Kansas, 1989; 1990.
Cordoni, Barbara, Professor, Ed.D, Duke University, 1976; 1977.
Crowner, James, Professor, Ph.D., Michigan State University, 1960; 1966.
Ewing, Norma J., Associate Professor and *Chair,* Ph.D., Southern Illinois University at Carbondale, 1974; 1973.
Foley, Regina, Assistant Professor, Ed.D., Northern Illinois University, 1989; 1990.
Hisama, Toshiaki, Associate Professor, Ph.D., University of Oregon, 1971; 1971.
Juul, Kristen, Professor, Ph.D., Wayne State University, 1953; 1970.
Miller, Sidney, Professor, Ph.D., The Pennsylvania State University, 1974; 1978.
Morgan, Howard, Professor, *Emeritus,* Ed.D., Wayne State University, 1962; 1969.
Rainey, Dan, Assistant Professor, *Emeritus,* MS.Ed., Southern Illinois University at Carbondale, 1956; 1957.
Teska, James A., Associate Professor, Ph.D., University of Illinois, 1969; 1973.

Speech Communication

COLLEGE OF COMMUNICATIONS AND FINE ARTS

Breniman, Lester R., Associate Professor, *Emeritus,* Ph.D., Ohio State University, 1953; 1954.
Crow, Bryan, Associate Professor, Ph.D., University of Iowa, 1982; 1981. Interpersonal communication, conversation analysis, media studies.
French, Kathryn, Assistant Professor, Ph.D., University of Southern California, 1989; 1990. Conversational analysis, interpersonal communication, and health communication.
Glenn, Phillip, Assistant Professor, Ph.D., University of Texas-Austin, 1987; 1989. Conversation analysis, interpersonal communication, laughter, play, conversational performance, conflict.
Higgerson, Mary Lou, Associate Professor, Ph.D., University of Kansas, 1974; 1973. Organizational communication and public relations.
Kleinau, Marion L., Professor, *Emeritus,* Ph.D., University of Wisconsin, 1961; 1959.
Kleinau, Marvin D., Associate Professor, *Emeritus,* Ph.D., Southern Illinois University at Carbondale, 1977; 1963.
Langsdorf, Lenore, Associate Professor, Ph.D., State University of New York at Stonybrook, 1977; 1990. Communication, rhetorical, argumentation, and social-political theory.
Lanigan, Richard L., Professor, Ph.D., Southern Illinois University at Carbondale, 1969; 1974. Continental-contemporary rhetoric, semiotics, phenomenology of communication, intercultural communication.
Major, Ann M., Assistant Professor, Ph.D., Southern Illinois University at Carbondale, 1988; 1989. Public relations, public opinion and communication management.
Pace, Thomas J., Professor, Ph.D., University of Denver, 1957; 1965. Interpersonal and small group communication, existential phenomenology and philosophy of communication, rhetoric and public address.
Parkinson, Michael, Associate Professor, Ph.D., University of Oklahoma, 1978, J.D., Southern Illinois University at Carbondale, 1987; 1978. Public relations and legal communication.
Pelias, Mary, Associate Professor, Ph.D., Southern Illinois University at Carbondale, 1982; 1983. Communication and instruction, research methods, quantitative, special populations and communication instruction.
Pelias, Ronald, Associate Professor, Ph.D., University of Illinois, 1979; 1981. Performance methodologies and criticism.
Pineau, Elyse, Assistant Professor, Ph.D., Northwestern University, 1990; 1990. Women's autobiography and personal narratives in performance.
Potter, David J., Professor, *Emeritus,* Ph.D., Columbia University, 1943; 1960.
Smith, William D., Associate Professor, *Emeritus,* Ph.D., Southern Illinois University at Carbondale, 1964; 1961.
Stucky, Nathan, Assistant Professor, Ph.D., University of Texas-Austin, 1988; 1990. Performance studies, staging literature, conversation analysis, dramatic literature.
Van Oosting, James, Professor and *Chair,* Ph.D., Northwestern University, 1981; 1981. Performance studies, creative writing, children's literature.

Technical Careers, College of

Bleyer, Dorothy R., Associate Professor, *Emerita,* Ph.D., Southern Illinois University at Carbondale, 1977; 1957.
Clarke, David S., Professor, M.S., Catholic University, 1980; 1981. Architecture, urban design, business, and economics.
Ellner, Jack R., Professor, Ph.D., New York University, 1969; 1971. Systems theory and philosophy, human engineering, philosophy and ethics of technology, design of special environments for the handicapped.
Isberner, Fred, Associate Professor, Ph.D., Southern Illinois University at Carbondale, 1984; 1983. Health education.
Miller, Harry, Professor, Ed.D., University of Nebraska, 1970; 1970.
Newmeyer, David, Associate Professor, Ph.D., Southern Illinois University at Carbondale, 1987; 1977. Education.
Rutledge, Clifton D., Associate Professor, M.Arch., Kansas State University, 1968; 1965.
Schafer, Joseph A., Associate Professor and *Director,* Aviation Technology, B.S., Lewis College, 1960.
Soderstrom, Harry, Professor, *Emeritus,* M.S., Bradley University, 1952; 1962.
Troutt-Ervin, Eileen, Assistant Professor, Ph.D., Southern Illinois University at Carbondale, 1986; 1976. Occupational education.
Vitello, Elaine M., Professor, Ph.D., Southern Illinois University at Carbondale, 1977; 1977.

Technology

COLLEGE OF ENGINEERING AND TECHNOLOGY

Andrews, Paul, Associate Professor, Ph.D., Southern Illinois University at Carbondale, 1979; 1971.
Barbay, Joseph E., Jr., Associate Professor, Ph.D., University of Missouri-Columbia, 1971; 1970.
Besterfield, Dale H., Professor, Ph.D., Southern Illinois University at Carbondale, 1971; 1962.
Dunning, E. Leon, Professor, *Emeritus,* Ph.D., University of Houston, 1967; 1957.
Ferketich, Robert R., Associate Professor, Ph.D., Southern Illinois University at Carbondale, 1980; 1971.
Johnson, Marvin E., Professor, *Emeritus,* Ed.D., University of Missouri-Columbia, 1959; 1948.
Lindsey, Jefferson F., III, Professor, D. Engr., Lamar University, 1976; 1980.
Orr, James P., Associate Professor, Ph.D., Southern Illinois University at Carbondale, 1983; 1979.
Rogers, Lee, Associate Professor, *Emeritus,* Ph.D., Southern Illinois University at Carbondale, 1975; 1967.
Rong, Yiming, Assistant Professor, Ph.D., University of Kentucky, 1989; 1990.
Szary, Marek, Assistant Professor, Ph.D., Wroclau (Poland), 1977; 1984.
Trivedi, Abhay V., Assistant Professor, Ph.D., North Dakota State University, 1988; 1985.

Theater

COLLEGE OF COMMUNICATIONS AND FINE ARTS

Chrestopoulos, Alexander, Assistant Professor, M.F.A., Arizona University, Tucson, 1980; 1990. Voice and acting.
Hiatt, Jan, Associate Professor, M.F.A., Ohio University, 1973; 1985. Costume design.
McLain, David, Adjunct Associate Professor, M.F.A., University of Oregon, 1979; 1988. Lighting design and technical direction.
McLeod, Archibald, Professor, *Emeritus,* Ph.D., Cornell University, 1943; 1947.
Merrill-Fink, Lori, Assistant Professor, M.F.A., University of Arizona, Tucson, 1988; 1988. Acting, voice, and movement.
Moe, Christian H., Professor and *Chair,* Ph.D., Cornell University, 1958; 1958. Playwriting, theater history, and criticism.
Morris, Michael, Assistant Professor, M.F.A., Southern Illinois University at Carbondale, 1988; 1988. Acting, directing.
Naversen, Ronald, Assistant Professor, Ph.D., Southern Illinois University at Carbondale, 1989; 1989. Scenic design.
Stevens, David, Associate Professor, Ph.D., Bowling Green University, 1973; 1984. Theater history and criticism.
Stewart-Harrison, Eelin, Professor, *Emerita,* Ph.D., Louisiana State University, 1968; 1961.
Straumanis, Alfreds, Professor and *Director of Graduate Studies,* Ph.D., Carnegie Institute of Technology, 1966; 1973. Baltic theater, theory, and criticism.

Vocational Education Studies

COLLEGE OF EDUCATION

Anderson-Yates, Marcia, Associate Professor, Ph.D., Southern Illinois University at Carbondale, 1975; 1970. Vocational education administration, office systems education, teaching methodology, curriculum development, philosophy of vocational education, women in administration.
Bailey, Larry J., Professor, Ed.D., University of Illinois, 1968; 1969. Career education and guidance, career development, theory and research, education/work legislation, research methods, tests and measurements.
Baker, Clora Mae, Assistant Professor, Ph.D., Ohio State University, 1989; 1989. Teaching methodology, curriculum & instruction, professional development, office administration, qualitative research.
Bortz, Richard F., Professor, Ph.D., University of Minnesota, 1967; 1977. Instructional systems design, occupational training and curriculum development, organizational and occupational analysis, competency-based education and training, individualized instruction, faculty development and evaluation.
Buila, Theodore, Associate Professor, Ph.D., Cornell University, Ithaca, NY, 1968; 1968. Education and training in developing countries, curriculum strategies in vocational education, nonformal education and training, agricultural development, foundation and policy issues in vocational-technical education.
Carter, Rose Mary, Assistant Professor, Ph.D., Purdue University, 1970; 1970. Special needs learners, curriculum development, supervision, methods of instruction, experience based career education.
Erickson, John H., Professor, *Emeritus,* Ed.D., Pennsylvania State University, 1953; 1955.
Gooch, Bill G., Associate Professor, Ed.D., University of Tennessee, 1973; 1973. Cooperative vocational education, management of vocational and technical education.
Huck, John F., Associate Professor, Ed.D., University of Illinois 1973; 1970. Education, training and development, applications of microcomputers in education/training, computer based training, and adult education.
Jenkins, James, Professor, *Emeritus,* Ed.D., Pennsylvania State University, 1955; 1956.
Keenan, Dorothy, Professor, *Emerita,* Ed.D., University of Illinois, 1962; 1961.
Legacy, James, Professor, Ph.D., Cornell University, 1976; 1977. Agricultural education, microcomputer use in education, curriculum development, extension education, teacher education, competency based vocational education.
Ramp, Wayne S., Professor, *Emeritus,* Ed.D., Bradley University, 1956; 1957.
Reneau, Fred W., Associate Professor., Ed.D, Virginia Polytechnic Institute and State University, 1979; 1979. Agricultural education, task analysis, research, adult education, curriculum development, supervision, and microcomputing.

Ridley, Samantha Sue, Assistant Professor, M.S., Southern Illinois University, 1959; 1964. Areas of specialization and interest: patternmaking, tailoring, special clothing needs for the physically handicapped and the elderly, consumer clothing and shopping preferences.

Rosenbarger, Maxine, Associate Professor, *Emerita,* Ph.D., Southern Illinois University, 1970; 1973.

St. John, Wayne L., Associate Professor, *Emeritus,* Ph.D., University of Oregon, 1954; 1975.

Stadt, Ronald W., Professor, Ed.D., University of Illinois, 1962; 1967. Evaluation, curriculum, leadership characteristics, industrial occupations, cooperative education, special needs, corporate training.

Stitt, Thomas R., Professor, Ph.D., Ohio State University, 1967; 1967. Curriculum specialist, agricultural education, cooperative vocational education, microcomputers, computer assisted instruction and methods.

Sullivan, James A., Professor, Ed.D., West Virginia University, 1967; 1968. Vocational program development, research methods, student performance assessment, federal legislation, cooperative education, hydraulic and rural water systems.

Washburn, John S., Associate Professor and *Chair,* Ed.D., University of Illinois, 1977; 1986. Employment and training, vocational education policy issues and legislation, vocational education research, curriculum development, personnel development, and vocational training for special populations.

Wood, Eugene S., Professor, *Emeritus,* Ed.D., University of Missouri, 1958; 1949.

Workman, Jane, Associate Professor, Ph.D., Purdue University, 1982; 1989. Social psychology of clothing, apparel technology and design, consumer behavior.

Zoology

COLLEGE OF SCIENCE

Anthoney, Terence R., Associate Professor, M.D., University of Chicago, 1968; and Ph.D., University of Chicago, 1975; 1971. Ethology, neurosciences.

Beatty, Joseph A., Associate Professor, Ph.D., Harvard University, 1969; 1965. Invertebrates: arachnology.

Blackwelder, Richard E., Professor, *Emeritus,* Ph.D., Stanford University, 1934; 1958

Brandon, Ronald A., Professor, Ph.D., University of Illinois, 1962; 1963. Herpetology, systematics of amphibians.

Burr, Brooks M., Professor, Ph.D., University of Illinois, 1977; 1977. Ichthyology.

Drickamer, Lee C., Professor and *Chair,* Ph.D., Michigan State University, 1970; 1987. Animal behavior.

Dyer, William G., Professor, Ph.D., Colorado State University, 1965; 1969. Parasitology: helminthology.

Englert, DuWayne C., Professor, Ph.D., Purdue University, 1964; 1963. Genetics.

Feldhamer, George A., Associate Professor and *Director of Graduate Studies,* Ph.D., Oregon State University, 1977; 1984. Mammalogy, wildlife ecology.

Garoian, George, Professor, *Emeritus,* Ph.D., University of Illinois, 1956; 1956.

Gates, Robert J., Assistant Professor, Ph.D., Southern Illinois University at Carbondale, 1989; 1990. Waterfowl/wetlands ecology and management.

George, William G., Professor, *Emeritus,* Ph.D., University of Arizona, 1961; 1964.

Heidinger, Roy C., Professor, Ph.D., Southern Illinois University at Carbondale, 1970; 1970. Ecology of fishes.

King, David G., Associate Professor, Ph.D., University of California, San Diego, 1975; 1977. Invertebrate neurobiology; evolution.

Klimstra, Willard D., Distinguished Professor, *Emeritus,* Ph.D., Iowa State University, 1949; 1949.

Kohler Christopher C., Associate Professor, Ph.D., Virginia Polytechnic Institute, 1980; 1981. Ecology: management, and culture of aquatic organisms.

Krajewski, Carey, Assistant Professor, Ph.D., University of Wisconsin-Madison, 1988; 1990. Molecular systematics; molecular evolution.

LeFebvre, Eugene A., Associate Professor, Ph.D., University of Minnesota, 1962; 1966. Ecology: physiological and conservation.

Lewis, William M., Professor, *Emeritus,* Ph.D., Iowa State University, 1949; 1949.

Martan, Jan, Professor, *Emeritus,* Ph.D., University of Oregon, 1963; 1964.

McKee, Michael J., Assistant Professor, Ph.D., University of Missouri at Columbia, 1985; 1988. Toxicology.

McPherson, John E., Jr., Professor, Ph.D., Michigan State University, 1968; 1969. Entomology: insect ecology.

Muhlach, William L., Assistant Professor, Ph.D., University of Illinois at Chicago, 1986; 1987. Developmental biology.

Phillippi, M. Ann, Assistant Professor, Ph.D., University of Kentucky, 1984; 1985. Ecology, natural area and resource management, conservation.

Roby, Daniel D., Assistant Professor, Ph.D., University of Pennsylvania, 1986; 1988. Avian wildlife ecology, nutrition.

Sheehan, Robert J., Assistant Professor, Ph.D., Southern Illinois University at Carbondale, 1984; 1986. Environmental biology of fishes.

Shepherd, Benjamin A., Professor, Ph.D., Kansas State University, 1970; 1969. Reproduction: comparative endocrinology.

Stahl, John B., Associate Professor, Ph.D., Indiana University, 1958; 1966. Limnology.

Stains, Howard J., Professor, *Emeritus,* Ph.D., University of Kansas, 1955; 1955.

Waring, George H., Professor, Ph.D., Colorado State University, 1966; 1966. Behavioral ecology and applied ethology.

Woolf, Alan, Professor, Ph.D., Cornell University, 1972; 1979. Wildlife ecology, population dynamics, diseases.

School of Medicine

CARBONDALE AND SPRINGFIELD CAMPUSES

Birtch, Alan G., Professor, M.D., Johns Hopkins University, 1958; 1972.
Borkon, Eli, Professor, *Emeritus,* M.D., University of Chicago, 1937; 1971.
Brewer, Gregory, Associate Professor, Ph.D., University of California, San Diego, 1972; 1980.
Chavez, Daniel J., Associate Professor, Ph.D., Colorado State University, 1979; 1981.
Clough, Richard W., Assistant Professor, Ph.D., University of Nebraska, College of Medicine, 1983; 1987.
Colvin, Robert H., Assistant Professor Ph.D., Southern Illinois University at Carbondale, 1971; 1972.
Davidson, Glen W., Professor, Ph.D., Claremont Graduate School, 1964; 1972.
Dayringer, Richard, Associate Professor, Th.D., New Orleans Baptist Theological Seminary, 1968; 1974.
Estavillo, Jaime A., Associate Professor, Ph.D., University of California, 1970; 1975.
Folse, J. Roland, Professor, M.D., Johns Hopkins University, 1958; 1971.
Hawe, Anthony, Clinical Associate Professor, M.B., Ch.B., Liverpool University, 1959; 1971.
Hoffman, Douglas W., Assistant Professor, Ph.D., University of Connecticut, 1979; 1984.
Jackson, R. Leon, Associate Professor, Ph.D., East Texas State University, 1967; 1973.
Jackson, Robert W., Professor and *Executive Associate Dean,* Ph.D., Purdue University, 1963; 1974.
Johnson, Robert Peter, Professor, *Emeritus,* M.D., University of Illinois, 1950; 1972.
Kabisch, William T., Professor, *Emeritus,* Ph.D., University of Chicago, 1954; 1970.
Masters, Thomas D., Clinical Professor, M.D., Rush Medical School, 1930; 1971.
Metzmaker, Charles O., Professor, M.D., University of Illinois, 1947; 1971.
Moy, Richard H., Professor, *Dean and Provost,* M.D., University of Chicago, 1957; 1970.
Parr, Earl L., Professor, Ph.D., Rockefeller University, 1968; 1981.
Pearson, Emmet F., Clinical Professor, *Emeritus,* M.D., Washington University, 1930; 1971.
Rabinovich, Sergio, Professor, M.D., University of San Marcos, 1953; 1973.
Roddick, J. W. Jr., Professor, *Emeritus,* M.D., Northwestern University, 1950; 1972.
Strano, Alfonso J., Clinical Professor, M.D., University of Texas, 1960; 1974.
Travis, Terry, Professor, M.D., Kansas University, 1964; 1972.
Zook, Elvin G., Professor, M.D., Indiana University, 1963; 1973.

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- Pages 53–212 refer to chapter 2, Academic Requirements.
- Pages *213–348* refer to chapter 3, Course Descriptions, and are printed in *italics.*
- Any number following an italic number refers to chapter 4, Faculty.
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