

1987

1987-1989 Southern Illinois University Bulletin Carbondale Campus (Graduate Catalog)

Southern Illinois University Carbondale

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Southern Illinois University
at Carbondale

BULLETIN

1987-1989

Graduate Catalog



SIU

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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 semester 1987 through spring semester 1989 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 These requirements may be superseded by future publications of the Graduate School Catalog.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

B U L L E T I N

1987-1989

Graduate Catalog

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

Volume 29 Number 1 June 1987

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This Catalog

The Graduate Catalog covers in detail questions concerning the graduate program of Southern Illinois University at Carbondale for the period from summer, 1987, through spring, 1989. It supersedes Volume 27, Number 1, of the *Southern Illinois University at Carbondale Bulletin* and the Graduate School General Information brochure dated 1985-1986.

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

Graduate Catalog

Undergraduate Catalog

School of Law Catalog

Schedule of Classes. Please specify term (fall, spring, or summer).

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Board of Trustees and Officers of Administration

Board of Trustees of Southern Illinois University

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University Calendar

Summer Session, 1987

Eight-Week Session Begins . . .	Monday, June 15, 7:30 A.M.
Independence Day Holiday . . .	Friday, July 3
Final Examinations	Thursday and Friday, August 6-7
Commencement	Saturday, August 8

Fall Semester, 1987

Semester Classes Begin	Monday, August 24, 8:00 A.M.
Labor Day Holiday	Monday, September 7
Thanksgiving Vacation	Saturday, November 21, 12:00 NOON —Monday, November 30, 8:00 A.M.
Final Examinations	Monday, December 14—Friday, December 18

Spring Semester, 1988 (Tentative)

Martin Luther King, Jr.'s Birthday	Monday, January 18
Semester Classes Begin	Tuesday, January 19, 8:00 A.M.
President's Day Holiday	Monday, February 15
Spring Vacation	Saturday, March 12, 12:00 NOON —Monday, March 21, 8:00 A.M.
Final Examinations	Monday, May 9—Friday, May 13
Commencement	Saturday and Sunday, May 14-15

Summer Session, 1988 (Tentative)

Eight-Week Session Begins . . .	Monday, June 13, 7:30 A.M.
Independence Day Holiday . . .	Monday, July 4
Final Examinations	Thursday and Friday, August 4-5
Commencement	Saturday, August 6

Fall Semester, 1988 (Tentative)

Semester Classes Begin	Monday, August 22, 8:00 A.M.
Labor Day Holiday	Monday, September 5
Thanksgiving Vacation	Saturday, November 19, 12:00 NOON —Monday, November 28, 8:00 A.M.
Final Examinations	Monday, December 12—Friday, December 16

Spring Semester, 1989 (Tentative)

Martin Luther King, Jr.'s

Birthday	Monday, January 16
Semester Classes Begin	Tuesday, January 17, 8:00 A.M.
President's Day Holiday	Monday, February 20
Spring Vacation	Saturday, March 11, 12:00 NOON —Monday, March 20, 8:00 A.M.
Final Examinations	Monday, May 8—Friday, May 12
Commencement	Saturday and Sunday, May 13-14

Summer Session, 1989 (Tentative)

Eight-Week Session Begins ...	Monday, June 12, 7:30 A.M.
Independence Day Holiday ...	Tuesday, July 4
Final Examination	Thursday and Friday, August 3-4
Commencement	Saturday, August 5

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, School of Agriculture, Agriculture Building

Thomas Gutteridge, College of Business and Administration, Rehn Hall

Keith R. Sanders, College of Communications and Fine Arts, Communication
Building

Donald L. Beggs, College of Education, Wham Education Building

Kenneth Tempelmeyer, College of Engineering and Technology, Technol
Building

Seymour Bryson, College of Human Resources, Quigley Hall

Rennard J. Strickland, School of Law, Lesar Law Building

John S. Jackson III, College of Liberal Arts, Faner Hall

Kenneth G. Peterson, Library Affairs, Morris Library

Richard H. Moy, School of Medicine, Wheeler Hall

Russell R. Dutcher, College of Science, Neckers Building

Harry Miller, School of Technical Careers, School of Technical Careers
Building

Southern Illinois University

Southern Illinois University is one of four senior, public university systems in the state of Illinois. A multi-campus institution serving approximately 33,000 students, SIU was chartered in 1869 as Southern Illinois Normal University located only in Carbondale. In 1947, the name of the institution was changed by legislative action to Southern Illinois University. In 1949, Southern Illinois University began offering off-campus academic courses in the metropolitan East St. Louis area. This initiative led to the eventual development in 1965 of a separate campus in Edwardsville.

The mission and scope of the Southern Illinois University system emphasizes a commitment to quality education, research, and service. As the Southern Illinois University system grew and flourished, its constituent universities developed programs of instruction, research, and public service which have attracted and served students, faculty, and staff not only from the region but from throughout the state of Illinois, the nation, and the international community.

Southern Illinois University, Central Administration is governed by a nine-member Board of Trustees which sets policy that enables the institutions to carry out their established missions and goals. The chancellor of the Southern Illinois University system is the chief executive officer of the system and is the primary link between the universities and the Board of Trustees. The university presidents are responsible for the internal operations of the respective institutions and report directly to the chancellor.

The University

History

Southern Illinois University has entered its second hundred years in operation. 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.

The University first operated as a two-year normal school but in 1907 became a four-year, degree-granting institution although continuing its two-year course into the 1930's. It was in 1943 that the school 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 1955. There has been diversification and expansion of graduate programs across the University

through the Colleges of Communications and Fine Arts, Education, Business and Administration, Human Resources, Liberal Arts, Science, Engineering and Technology, and the School of Agriculture. In addition to expansion of programs within the Graduate School, professional schools have been established in medicine and law.

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.

Location

The city of Carbondale is approximately 100 miles southeast of St. Louis, Missouri, in Jackson County, the western border of which is the Mississippi River. 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. The region immediately surrounding Carbondale is noted for its large peach and apple orchards. 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

Immediately south of the city of Carbondale, the University 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. Two beautiful features that are located near the center of the campus complex are a wooded tract, preserved in the tradition of the native forests of Southern Illinois, and several buildings surrounding the site which formed the original campus a century ago. Approximately seventy large permanent buildings and several hundred small temporary buildings are located on the campus.

In addition to the numerous recreational facilities in the area, the University's own Lake-on-the-Campus offers facilities for swimming, boating, fishing, and picnicking within the confines of the campus. The Touch of Nature Environmental Center, a 6,500-acre complex on the shores of picturesque Little Grassy Lake, provides opportunity for outdoor learning experiences. The center serves as a field site for the Departments of Botany, Recreation, Special Education, Zoology, and Forestry. Its newly remodeled facilities have enabled the center to host conferences for business groups and educational organizations.

The Graduate School

The primary concerns of the Graduate School are graduate instruction and research at Southern Illinois University at Carbondale. 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 students who meet the Graduate School's high standards of achieve-

ment by completing advanced courses of study and through students and faculty members who achieve significant results in their research, the Graduate School makes its contribution to the public welfare of the region, the state, the nation, and the international community.

The Graduate School offers master's degrees through sixty-one programs, the specialist degree in three areas, and the doctoral degree through twenty-two programs. All programs are fully accredited. More than 3,400 graduate students pursue advanced study and research under the leadership of a graduate faculty of over 900 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 seven colleges and four schools. These are the Colleges of Business and Administration, Communications and Fine Arts, Education, Engineering and Technology, Human Resources, Liberal Arts and Sciences, and the Schools of Agriculture, Law, Medicine, and Technical Careers.

Within these colleges and schools are outstanding 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, Southern Illinois University at Carbondale operates a number of research centers, most of which have been established with the aid of outside funding. These are:

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. A collection representing 20 years of research makes it the largest archaeological repository in the region. The center conducts an annual field school, provides thesis and dissertation data, and research opportunities for numerous students of archaeology.

Coal Extraction and Utilization Research Center (CEURC): The Coal Extraction and Utilization Research Center 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 Coal Extraction and Utilization Research Center 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 Small Operator Assistance Program, a service program for coal operators producing less than 100,000 tons per year. In addition, the Coal Extraction and Utilization Research Center administers 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 animals; endangered, and nongame wildlife; aspects of land use and the impact on wildlife resources; and the epizootiology of zoonotic and other diseases in wildlife. More than 20 projects directed by laboratory staff currently afford graduate fellows and research assistant 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. 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 program which has been developed in recent years. Some of the areas of research stressed are trophic ecology, water quality, pond culture, tank culture, polyculture, culture system development, nutrition, fish physiology, 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 storage buildings. A new 10,000 square-foot wet-laboratory building has just been completed.

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 conceived by Southern Illinois University at Carbondale to meet the needs of the state in the areas of biotechnology, microelectronics, and materials technology. The existence of vast coal resources and other raw materials in southern Illinois and the nationally recognized efforts of Southern Illinois University at Carbondale in coal research made SIUC the rational selection of the state for materials technology research, based in part on developing coal as a raw material and feedstock for current and new materials. In addition, research in the development and application of composite materials and catalysis are included in this research thrust. As this activity develops, other indigenous material feedstocks may be developed in the future.

The center provides a focus for the resources of the academic and industrial communities on the development of materials technology.

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

Accrediting 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 Chemical Society

American Council on Education for Journalism
 American Psychological Association
 American Speech and Hearing Association by American Board of Examiners
 in Speech and Hearing
 Council on Rehabilitation Education
 Illinois Office of Education
 Superintendent of Education
 State Board of Education
 National Council for Accreditation of Teacher Education
 National Association of Schools of Music
 Society of American Foresters

Office of Research Development and Administration

The Office of Research Development and Administration 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 Office of Research Development and Administration 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.

RESEARCH SHOPS AND SERVICES

To further assist faculty researchers, the Office of Research Development and Administration operates nine support service units for their use. The *Central Research Shop* is a facility which designs, repairs, and constructs special equipment required by researchers. The *Research Photography and Illustrations Unit* offers consultation and technical assistance to all researchers in need of scientific photography as an integral part of their research endeavors. For those researchers who use animals, a central animal facility or *Vivarium* is maintained under the direction of a veterinarian to insure proper and humane care and management of animals as is necessary and legally required. The *Center for Electron Microscopy* houses two scanning and two transmission scopes, as well as other related equipment for the use of faculty researchers. The *Fine Instruments Research Shop* has two components: *electrical* and *mechanical*. This shop provides consultation, design, and fabrication of sophisticated electronic and mechanical instruments. The *Glassblowing Research Shop* provides design and fabrication of glass apparatus for research use. The *Machine Research 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 for a number of magnetically active nuclei. A number of spectroscopic techniques are available for use. Other research facilities are available throughout the campus and in the region relating to the various master's degree and doctoral programs of the Graduate School.

Facilities and Services

Morris Library

Morris Library, one of the larger open-shelf, subject division academic libraries

under one roof in the country, contains over 1,765,000 volumes and subscribes to some 15,000 current periodicals. In addition to books and journals, the library has extensive collections of maps, manuscripts, rare books, government documents, phonograph records and about 2,394,000 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 the Illinois Library Computer System (LCS), a state-wide automated circulation system. A computer-based inter-library loan system serves to identify material in other libraries and to transmit requests for items. On-line computer-based bibliographic search capabilities using over 300 data bases are available. 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, graphics materials, films, 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 packages; through 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 coupled with two IBM 4341's running VM, MVS and RSCS with CMS and MUSIC. These systems have access to 48 megs of memory, 24 billion bytes of on-line disk, 12 tape units, 4,600 line per minute print capacity, and communications equipment for over 1,200 interactive devices. Special features of the Computer Center are instructional laboratories equipped with 180 interactive terminals, 64 micro-computers and associated peripherals.

Placement Services of the University Placement Center

The University Placement Services assists students and alumni seeking career employment. Maximum benefit from the services is assured for students who file their resumes approximately one semester prior to graduation. Alumni should periodically update their resumes which are placed on file for ten years. All inquiries concerning this service should be made to the University Placement Center office.

Housing

On-Campus Housing. Double occupancy housing is available in residence halls for single graduate students. All contracts will be for room and board.

University-owned housing for married students includes 304 unfurnished two- or three-bedroom air-conditioned apartments and 272 furnished efficiency,

one- or two-bedroom apartments. Because the demand for university housing for married students exceeds the supply, information should be requested early from University Housing, Building B, Washington Square.

Off-Campus Housing. The Off-Campus Housing Office, Building B, Washington Square, maintains current information on off-campus rooms, apartments, houses for rent, or for sale, and trailer parks. Experience has shown that satisfactory arrangements cannot be made by mail. A personal visit is usually required. Prices vary widely, ranging from \$90 a month for trailer spaces to \$350 a month or more for houses and apartments. All arrangements for off-campus housing and all business transactions in the matter of this type of housing are the sole responsibility of the student and the owner of the facility.

International Programs and Services

International Programs and Services is an administrative unit within academic affairs and reports to the associate vice president for academic affairs and research services. 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 concern. 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. The telephone number is 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. Other developmental activities such

as international student recruitment and alumni are carried out in cooperation with Admissions and Records and Alumni Services.

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. The telephone number is 453-5774.

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 intersession periods under the auspices of this division.

The Study Abroad Programs division is located at 803 S. Oakland. The telephone number is 453-5774.

Student Health Program

The Student Medical Benefit (SMB) fee provides funding for an extensive health program. On-campus services include the wellness programs, out-patient care, an infirmary, laboratory services, x-rays, a pharmacy, 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 emergency care when the Health Service is closed, should call the Dial-A-Nurse program, 536-5585 for health care advice or help in deciding whether you need to go to the Memorial Hospital of Carbondale emergency room. If an ambulance is required, students should call the Jackson County Ambulance Service at 529-5111.

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 administration office—insurance section of the Student Health Program. When applying, students should provide a copy of their insurance policy.

Optional coverages are also available for dependents and excess supplemental coverage. Details and prices for these policies are available and must be purchased in the first three weeks of the semester. Information is available from the Student Health Program insurance office, Room 118 of Kesnar Hall, Small Group Housing or call 453-3311. For detailed information about our programs, call for a copy of our brochure, 453-3311.

Disabled Student Services

The University maintains a commitment to make all services, programs, and facilities available to students with disabilities. Numerous services are provided to disabled students through the Disabled Student Services Office and other departments in order that this student population may obtain the maximum academic, social, and cultural benefits within the University community. Services and programs include preadmission planning, orientation and mobility training, adapted van transportation, wheelchair repair, attendant recruit-

ment and referral, adapted recreation, interpreters and notetakers for hearing impaired students, specialized materials and equipment for visually handicapped students, reader recruitment and referral, proctoring academic examinations, consultation with faculty, accessible housing referral, special parking, and liaison with agencies such as the Illinois Department of Rehabilitation Services. The campus is quite accessible and usable by students using wheelchairs, visually impaired, hearing impaired, learning disabled, and other permanently disabled students. The University Housing office also provides modified housing facilities in the Thompson Point Residence Halls and in the family housing areas. Prospective and newly admitted graduate students should contact Disabled Student Services for 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 many 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 workforce 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. Responsibility is assumed for the coordination and monitoring of the Night Safety Vans, Women's Transit System, the Brightway Path, and the women's self defense classes as part of campus safety and rape prevention activities. Prevention education is available for individuals, residence halls, classes, and groups upon request.

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

The University Ombudsman

The University Ombudsman is an independent and impartial University agency directly responsible to the president. The mission of the University Ombudsman is to assist members of the campus community to resolve questions respecting their rights. Students, faculty, administrative/professional, and civil service staff are encouraged to contact the University Ombudsman office for assistance when experiencing difficulties as a result of adverse administrative decisions, conflicts with others, or confusion about University rules and procedures. The office maintains up-to-date information files on University policies and procedures. All contacts made are confidential.

The University Ombudsman office solves a broad range of problems and conflicts. Even the most serious controversies can often be resolved through mediation. The basic work of the office also generates information serving to identify recurring problem areas or emerging ones. These may result from changes in University policies and procedures, internal adjustments, consolidations, or

responses to changing needs. They may also result from exogenous shocks such as changes in financial aid, enrollment, demographics, or other stresses. The University Ombudsman reports to the president and administrators regarding this knowledge, both regularly and irregularly, in the interest of the efficient functioning of the University.

The office is located in Woody Hall C302: hours are 8:00 to 4:30, Monday through Friday; and the telephone number is 453-2411.

Graduate Degrees Offered

The Graduate School offers a variety of master's degrees, the specialist degree, the Doctor of Philosophy degree, the Doctor of Rehabilitation degree and the Doctor of Business Administration degree. 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 Fine Arts, M.F.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.E.; Master of Social Work, M.S.W.

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

Music Theory and Composition	
Opera-Music Theater	
Performance	
Piano Education Arts	
Occupational Education	M.S.Ed.
Philosophy	M.A.
Physical Education	M.S.Ed.
Experimental Physical Education	
Professional Physical Education	
Applied Physical Education	
Physics	M.A., M.S.
Physiology	M.S.
Plant and Soil Science	M.S.
Crop Science	
Soil Science	
Horticultural Science	
Political Science	M.A.
Psychology	M.A., M.S.
Experimental	
Clinical	
Counseling	
Public Affairs	M.P.A.

Recreation	M.S.Ed.
Park and Community Recreation	
Recreation for Special Populations	
Outdoor Recreation	
Commercial Recreation	
Rehabilitation Administration and Services	M.A., M.S.
Adjustment Services	
Vocational Evaluation	
Job Development and Placement	
Rehabilitation Administration	
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.
Theater	M.F.A.
Zoology	M.A., M.S.

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
Botany
Chemistry
Communication Disorders and Sciences
Economics
Education
Curriculum and Instruction
Educational Administration
Educational Psychology
Health Education
Higher Education
Occupational Education
Physical Education
Special Education
Engineering Science
English
Geography

Physical Environmental Systems
Resource Management Systems
Geology
Historical Studies
Journalism
Mathematics
Microbiology
Molecular Science
Philosophy
Physiology
Political Science
Psychology
Experimental
Clinical
Counseling
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.

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 classes for the term for which admission is sought. The applicant must have earned a grade point average (GPA) of 2.40 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 whose GPA is below 2.40 may be admitted as an unclassified student, and later apply to a degree program when 12 or more semester hours of graduate work at SIUC have been completed with a grade point average of 3.00 or better in courses for which grades of *A*, *B*, *C*, *D*, *F*, have been assigned. If the applicant has completed 12 or more semester hours of graduate work, a GPA of 3.00 or better must have been earned on all graduate work completed in order to qualify for admission to a degree program, regardless of the undergraduate GPA. An applicant may not be admitted to a degree program with a graduate GPA of less than 3.00.

The faculty of a degree-program unit may add its own grade-point average requirements and other requirements above the Graduate School minima, for admission to that particular program. The student should consult the description of the appropriate program for specific requirements.

An applicant who meets Graduate School requirements but is disapproved by the degree program to which application was made may be admitted as an unclassified student or may apply to another degree program.

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 coursework 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 Southern Illinois University at Carbondale or elsewhere, will be counted toward the degree. All students must remain registered until completion of their degree. See section Continuing Registration 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 coursework 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 coursework 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 MBA program).

Comprehensive or oral examination.

Submission of departmental clearance form.

Register for 601 Continuing Research.

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 Southern Illinois University at Carbondale, 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 Registration 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 coursework 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 coursework 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 Southern Illinois University at Carbondale 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 coursework, 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 Southern Illinois University at Carbondale 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 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. 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 Registration 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. 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 registration 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 \$48.50 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 \$25.00 to cover the cost of publication of the abstract. If copyright is desired, an additional fee of \$20.00 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 Southern Illinois University at Carbondale 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
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 \$48.50 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 Research.

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 (Nondegree).

APPLICATION FOR GRADUATE STUDY

A student should obtain application forms from the Graduate School and submit the application directly to the Graduate School where it will be evaluated for compliance with Graduate School admission requirements. Some departments require a separate departmental application in addition to the Graduate School application. The applicant should consult the particular program description to determine if a separate departmental application is required. In such cases, the student should contact the department directly.

Transcripts

A student applying to a degree program must have the registrar of each college previously attended (except Southern Illinois University at Carbondale) send an official transcript of the student record to the Graduate School. Students applying for unclassified (nondegree 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. Students applying for a degree program must have the registrar of each institution attended (other than Southern Illinois University at Carbondale) send one official transcript to the Graduate School. Transcripts need not be sent from institutions from which the student received neither a degree nor more than 12 semester hours of undergraduate credit, provided that the grades obtained at such institutions are recorded upon the transcript of a college which has granted the student a degree. Transcripts required by the Graduate School must be sent directly to the Graduate School. Copies submitted directly by the student or sent to a department are not acceptable. No transcripts or other admission credentials will be returned or forwarded to other institutions. Only if these steps are taken and if the student

applies for a degree program will the application be forwarded to the academic unit in which the student indicates a desired major.

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 GRE, MAT, or other appropriate standardized tests for admission to their program. Refer to the departmental program description or contact the graduate program director 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 to the Graduate School no later than 30 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 to the Graduate School. 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 institution(s) 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. These supporting materials should be sent 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 stu-

dents. 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, Southern Illinois University at Carbondale, Carbondale, Illinois 62901.

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 foreign-born applicants not admitted under paragraph one under Academic Requirements listed below whose primary spoken language is not English must achieve a TOEFL score of 550. For some degree programs this minimum has been lowered to 500. This test must have been taken no more than 12 months prior to the term for which the applicant is seeking admission.

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.

If a foreign-born applicant has completed the equivalent of a four-year baccalaureate degree in any other country, or at an unaccredited institution, such applicant 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 international student assigned a graduate assistantship with teaching duties must pass an oral examination conducted by the Center for English as a Second Language 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. This adviser will assist the student in planning the total program and in choosing courses each term.

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

Responsibility for errors in programs or in interpretation of regulations of the Graduate School and the University rests entirely upon the student. Students who have questions regarding admission, registration, or degree requirements

should consult their major department or the Graduate School. It is the students' responsibility to see that their records in the Graduate School office, in the Office of Admissions and Records, and with their respective major advisers are up-to-date and brought together well in advance of the time of graduation. The student cannot be approved for graduation unless these records are available at least six weeks in advance of the time of graduation.

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

Students who officially register for courses may not withdraw merely by the stopping of attendance. They must process an official withdrawal form. Outlined below are the procedures to be followed by graduate students when withdrawing from courses and when withdrawing from the University (all courses for which registered).

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

COURSE WITHDRAWALS

Students officially withdraw from courses through the program change pro-

cess. 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 "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 considerations 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 coursework 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:

Type of Financial Support	16-Week Semester		8-Week Session	
	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

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

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 Registration Requirement

Students who have not completed all degree requirements but who have registered for the minimum number of research, thesis, or dissertation credit hours required of the degree, must register every semester until all degree requirements have been completed. Summer sessions are exempted from the continuous registration requirement. Any graduate student who must continuously register as described above and who subsequently completes degree requirements without having registered continuously each intervening semester must have the permission of the graduate dean to graduate. Such permission will be contingent upon payment of the tuition that would have been paid if the student had registered continuously each semester.

Continuing Research—601. Continuing Research—601 is a graduate credit course 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 is required of all graduate students, whether in residence or not, and who are not otherwise registered. Credit hours in 601 are 1 to 12 per semester. The specific number is to be determined by the major professor in consultation with the student. At the discretion of the department the student may be required to register for more than one hour of 601 per semester.

Students registering for 601 in a semester, are assessed only tuition and Student Center Fee for the credit hours associated with that course registration. Since none of the other student fees are assessed for that course registration, the student is not eligible for the benefits of any of those other programs such as Recreation Center use, Health Service and Student Medical Benefits, Students Attorney Program assistance, etc. Students desiring the above benefits that require fees should register for 599 or 600 instead of 601.

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 worker, or as an administrative assistant, (2) fellow-

ships 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 scholarship program may be obtained from the Graduate School Office. Information regarding the student work program and loans may be had by contacting the Student Work and Financial Assistance 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. Unclassified graduate students (those not working for a degree) are eligible only for the student work program.

Graduate assistant appointments, graduate fellowships, and most traineeships include remission of tuition, but fees must be paid. 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 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 Assistant Appointments

Graduate assistant appointments are available in a number of departments, research agencies, and administrative units. This type of appointment comprises the largest number of awards offered by the University. For these appointments, students apply directly to the chairperson of the department to which they have been admitted, who may in turn refer the students to a research agency or administrative unit that may have need for a student with the skills indicated. Only those students who have been admitted to degree programs are eligible to be appointed as graduate assistants. Unclassified students are not eligible for graduate assistant appointments.

A graduate student who holds a graduate assistant appointment of at least one-quarter of full time and who is appointed for the full length of an academic term (semester or full-length summer session) is eligible for a waiver of tuition each academic term the appointment is held. If a student is appointed for less than a full academic term on a fiscal pay basis, the student is not eligible for a tuition waiver for that academic term. A student who holds an appointment for the full academic term but resigns before the end of that term, and who continues to be registered for courses, shall be liable for the full tuition for the term.

A graduate student who has held an appointment requiring service to the University of at least 25 per cent of full time, for the full length of each of two consecutive semesters, will be eligible for a waiver of graduate tuition for the

summer session immediately following the two consecutive semesters of service. In no case shall the additional term of tuition waiver be granted before the two consecutive semesters of service have been completed. This additional term of tuition waiver shall not apply to nonservice appointments or to graduate fellowships, or graduate dean's fellowships.

Service of 20 hours per week, or a corresponding load in teaching, is required for a half-time appointment. Graduate assistantship appointments pay stipends of at least \$440 per month for master's students for half-time duties; stipends increase at the Ph.D. level to a minimum of \$510 per month. Appointments are normally made for the nine-month academic year. There are a limited number of appointments for the summer session. Information about the specific conditions of the appointment should be directed to the department or office making the award.

College Work-Study Graduate Assistantships

The Graduate School and the Office of Student Work and Financial Assistance jointly administer the College Work-Study Assistantship program. This program supports approximately fifty graduate assistants each year. The program provides for up to 80% 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 and Traineeships

The Graduate School and specific departments offer a number of graduate fellowships and traineeships. 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 \$480 per month, or \$5,280 for eleven months for master's degree students; for doctoral degree students the stipend is \$520 per month, or \$5,720 for eleven months. Graduate School fellowships include waiver of tuition. 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.

Individual departments often are able to provide traineeships. The Graduate School administers a limited number of such traineeships and plans to increase the number if possible. 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 coursework 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 candi-

dacy 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 \$620 or \$6,820, plus waiver of tuition.

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 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 chairperson 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 thirty 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 \$8,500 and a waiver of tuition 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.

Graduate and Professional Opportunities Program (GPOP)

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 GPOP program at SIUC is to recruit qualified minority students to doctoral programs in psychology and rehabilitation and further provide a mechanism for their psychological, social, and educational support. Stipends for GPOP fellows are the same as the graduate fellowships. Contact the Graduate School for information.

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. The tuition scholarship is normally awarded for two consecutive semesters (one academic year).

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 waiver. Tuition scholarship recipients must enroll for a minimum of eight hours each semester. 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. Completed application forms should be in the Graduate School Office no later than April 1 preceding the year for which the tuition scholarship is requested.

Student Work and Financial Assistance

Other forms of financial assistance available through the Student Work and Financial Assistance 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 Graduate School or from department chairpersons 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.

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			Non-Illinois Residents		
	Tuition	Student Fees	Total	Tuition	Student Fees	Total
1	\$ 46.35	\$102.31	\$148.66	\$ 139.05	\$102.31	\$ 241.36
2	92.70	117.62	210.32	278.10	117.62	395.72
3	139.05	132.93	271.98	417.15	132.93	550.08
4	185.40	148.23	333.63	556.20	148.23	704.43
5	231.75	163.54	395.29	695.25	163.54	858.79
6	278.10	178.85	456.95	834.30	178.85	1013.15
7	324.45	194.16	518.61	973.35	194.16	1167.51
8	370.80	209.47	580.27	1112.40	209.47	1321.87
9	417.15	224.77	641.92	1251.45	224.77	1476.22
10	463.50	240.09	703.59	1390.50	240.09	1630.59
11	509.85	255.39	765.24	1529.55	255.39	1784.94
12 or more	556.20	270.70	826.90	1668.60	270.70	1939.30

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 \$36 is required of all doctoral students at the time the dissertation is submitted for approval. If copyright is desired, an additional fee of \$20 is required. (Additional fee information is available in the schedule of classes.) Student fees include:

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 registration. Refer to the section titled "Continuing Registration 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 Student Work and Financial Assistance 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 Office of Student Work and Financial Assistance 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

The following is a direct quotation from the Board of Trustees' "Regulations Governing the Determination of Residency Status for Admission and Assessment of Student Tuition."

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 words *he* or *his* also apply to a female unless otherwise stated or clearly indicated. The term *the State* means the State of Illinois. 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. (See section on students from Kentucky and Missouri below.)

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 occurs, 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 he 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 his 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 his 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 he has been supported for a period of at least three consecutive months immediately preceding his registration at the University 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 he (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 his 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, he shall be considered to be a Resident even though his 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 he has maintained a dwelling place within the State uninterruptedly for a period of at least three consecutive months immediately preceding the beginning of any term for which he registers 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 he continues to reside in the State; however, a spouse through which a student claims residency must demonstrate his or her own 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 he was a resident of the State at the time he entered military service.

A person who is separated from active military service will be considered a Resident of Illinois immediately upon separation providing he: (a) was a resident of the State at the time he entered 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 his 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 he 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. The spouses and dependent children of all staff members (academic, administrative, nonacademic) on appointment with the University shall be considered as Resident students for purposes of tuition assessments.

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 his true, fixed, and permanent home and place of habitation. It is the place to which, whenever he is absent, he 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 the student is dissatisfied with the ruling in response to the written claim made within said period, he may appeal the ruling to the Legal Counsel by filing with the appropriate official within twenty days of the notice of the ruling a written request.

Kentucky, Missouri Residents. Graduate students attending SIUC from the

fourteen westernmost counties of Kentucky may be charged in-state tuition rates. Graduate students from the state of Missouri who are taking no more than six hours during a semester will be assessed in-state rates. Missouri residents with more than six hours will be assessed out-of-state tuition rates for all hours taken during the semester.

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. (Appropriate forms are available in the Graduate School office.) 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

Undergraduate students are permitted to register for 500-level courses for undergraduate credit only by special permission of the graduate dean. Such permission will be granted only to properly qualified students. The procedure for obtaining such permission is as follows: the chairperson of the department offering the course, in collaboration with the instructor who is teaching the section of the course in which the student desires to enroll, and in consultation also with other appropriate persons such as the director of graduate studies for the department, should write a letter to the graduate dean indicating their approval for the student to take a particular 500-level course for undergraduate credit.

Such a request should be made only for a truly superior student, and there should be a clear expectation that the student would perform above the median of graduate students in the course. The letter should therefore include some information on the student's academic work with particular attention to advanced and relevant courses in the major area. Appropriate grade point averages should be included. If the petition is granted, a letter will be sent from the graduate dean to the registrar, asking that the specified credit be accepted in the student's undergraduate program.

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 Southern Illinois University at Carbondale.

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 Southern Illinois University at Carbondale.

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 uni-

versity, 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 Doctor of Philosophy 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 Southern Illinois University at Carbondale.

Students who have been admitted to the Graduate School and who have completed satisfactorily the nine-month agro-industrial and industrial development management program at the graduate school of the United States Department of Agriculture will receive credit from Southern Illinois University at Carbondale for 12 semester hours of graduate work which may be applied toward requirements of a Master of Science degree in agribusiness economics.

The department recommending the graduate degree shall administer all required general and final examinations, and a member of the graduate faculty at Southern Illinois University at Carbondale 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 instructor(s) should submit a grade change card together with an explanation and justification of the grade change for the approval or disapproval of the department chairperson, 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 instructor(s) 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.

Academic Grievances Policy/Procedures

Graduate students at Southern Illinois University at Carbondale 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 Southern Illinois University at Carbondale 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 chairperson 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.

* 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.

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.

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.

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 Southern Illinois University at Carbondale 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 Southern Illinois University at Carbondale.

A graduate student who is on academic probation and has been on academic probation for at least one academic term, and who has accumulated six or more semester hours (or the equivalent) of *C* unbalanced by *A* in graduate-level courses taken at SIUC will be suspended from the Graduate School.

For the purpose of calculating hours of *C* or the equivalent, each hour of *D* is equivalent to two hours of *C* and each hour of *F* is equal to three hours of *C*. A student who is suspended from the Graduate School under these conditions will not again be eligible for admission to the Graduate School unless a special exception is granted by the graduate dean upon petition by the department the student wishes to enter.

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 \$10 graduation fee is established for all persons receiving degrees. The fee is payable at the time of application. 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 \$36.00 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 graduate dean 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 or the Housing Business Services Office.

Graduate Program Directors

The faculty members listed below have been designated by their department as responsible for formally approving admission of graduate students to their degree programs, certifying completion of degree requirements, and serving as liaison with the Graduate School regarding student progress.

Applied Linguistics: Paul J. Angelis
Accountancy: Marvin Tucker
Administration of Justice: Dennis
Anderson

Agribusiness Economics: William
Herr
Agricultural Education and
Mechanization: Fred Reneau

Animal Industries: A. W. Young
 Anthropology: Robert Corruccini
 Art: Michael O. Onken
 Behavior Analysis and Therapy:
 Brandon Greene
 Biological Sciences: John W. Voigt
 Botany: Walter E. Schmid
 Business Administration: Ike Mathur,
 Greg White
 Business Education: Heidi Perrault,
 John Washburn
 Chemistry and Biochemistry: David
 Koster, David Schmulbach
 Cinema and Photography: David
 Gilmore
 Communications Disorders and
 Sciences: Kenneth Ruder
 Community Development: Jnan
 Bhattacharyya
 Computer Science: Kenneth Danhof
 Curriculum and Instruction: Billy G.
 Dixon
 Economics: Michael Shields
 Education (Ph.D.): Donald L. Beggs
 Educational Leadership: William
 Eaton
 Educational Psychology: John Cody
 Engineering:
 Civil Engineering and Mechanics:
 Phil K. Davis
 Electrical Engineering: Vernold
 Feiste
 Mechanical Engineering and
 Energy Processes: Albert Kent
 English: Raymond Rainbow
 English as a Foreign Language: Paul
 J. Angelis
 Foreign Languages:
 French: Margaret Winters
 German: Thomas Keller
 Spanish: Arnold Ulner
 Forestry: Dwight McCurdy
 Geography: David M. Sharpe
 Geology: John Utgaard
 Health Education: Donald N.
 Boydston
 Higher Education: William Eaton
 History: Stanley Zucker
 Journalism: Erwin L. Atwood
 Mathematics: Joseph Yucas
 Microbiology: John Martinko
 Mining Engineering: Paul Chugh
 Molecular Science: Gerard V. Smith
 Music: Helen Poulos

Occupational Education: John Huck
 Philosophy: Elizabeth Eames
 Physical Education: Ronald Knowlton
 Physics: Walter Hennenberger
 Physiology: Lonnie Russell
 Plant and Soil Science: Donald Stucky
 Political Science: William
 Hardenbergh
 Psychology: James McHose
 Public Affairs: Osbin Ervin
 Recreation: John R. Allen
 Rehabilitation Administration and
 Services: Brockman Schumacher
 Rehabilitation Counseling: Brockman
 Schumacher
 Rehabilitation (Rh.D.): Stanford E.
 Rubin, Gary Austin
 Social Work: Mary Davidson
 Sociology: Thomas Burger
 Special Education: Norma Ewing
 Speech Communication: Thomas J.
 Pace
 Statistics: Joseph Yucas
 Telecommunications: Frank Oglesbee
 Theater: David Stevens
 Vocational Education Studies: John
 Huck
 Zoology: Brooks M. Burr

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

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 five 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 five 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 five core courses in accountancy at the graduate level which must be completed by all students are:

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

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 fifteen hours beyond the accountancy core requirements are:

522 Financial Accounting Theory	552 Accounting Information Systems
529 Seminar in Financial Accounting	II
532 Controllorship	562 Advanced Auditing Topics
542 Tax Research and Procedure	571 Not-For-Profit Accounting
543 Corporate Taxation	590 Seminar In Accounting
544 Partnership Taxation	591 Independent Study
545 Estate Planning	599 Thesis
546 Seminar: Selected Tax Topics	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 two 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 five 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 ten hours in law, and twelve 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 a national reputation for quality research and an outstanding educational offering. Along this line the center was awarded a special grant to develop a national model for a graduate program in the area of criminal justice planning, research, and evaluation. 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 the research projects conducted by the center. In addition there are a number of fellowships offered, one of particular importance is the Celia M. Howard Fellowship award for women residents of Illinois pursuing the Master of Science degree in administration of justice. This fellowship covers tuition costs and is sponsored by the Illinois Federation of Business and Professional Women's Clubs. Application information will be furnished by the center.

The Center for the Study of Crime, Delinquency, and Corrections offers the Master of Science degree in the administration of justice. This curriculum—a multidisciplinary 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 in criminal justice career programs; criminal justice research and planning; and private security management.

Augmenting the academic program, the research unit provides opportunity for graduate students to work with faculty members conducting research related to the administration of justice and in designing innovative projects in

the field. Internship placement is included as an integral part of most areas of emphasis 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 or the Millers Analogies Test (aptitude portion only) are also required.

While a major in the administration of justice is the desired undergraduate preparation for graduate study in the field, a variety of other areas of emphasis are acceptable. A minimum of twelve units in sociology, psychology, or other social sciences is recommended. Other undergraduate majors may be appropriate, depending upon the area of emphasis chosen. In individual cases, additional selected undergraduate courses may be required for acceptance in this program.

Requirements

Required Core Courses for Law Enforcement or Corrections Emphasis.

Administration of Justice 587 is required of those whose emphasis is in law enforcement whereas AJ 571 is required of those whose emphasis is in corrections.

AJ 500-3 History and Philosophy of Criminal Justice System

AJ 504-3 Criminological Theory

AJ 416-3 Methods of Criminal Justice Research

AJ 417-3 Research Practicum in Administration of Justice

AJ 587-3 Seminar in Law Enforcement, or

AJ 571-3 Correctional Systems in Criminal Justice

Required Core Courses for Criminal Justice Research Emphasis.

AJ 500-3 History and Philosophy of Criminal Justice System

AJ 504-3 Criminological Theory

AJ 516a-3 Seminar in Advanced Criminal Justice Research, Design

AJ 516b-3 Seminar in Advanced Criminal Justice Research, Analysis

AJ 587-3 Seminar in Law Enforcement, or

AJ 562-3 Fundamental Legal Systems in Criminal Justice, or

AJ 571-3 Correctional Systems in Criminal Justice

Supervised Field Work (Internship) Required for All Areas of Emphasis. Students may take a total of 12 hours internship and are encouraged to do so; however, only 6 hours may be counted toward the 36 hours required for the master's degree.

AJ 595A-3 Supervised Field Work (Internship) Graded S/U

AJ 595B-3 Supervised Field Work (Internship) Letter Graded

Area of Emphasis. The area of emphasis will be composed of 12 units in addition to the introductory courses, 9 of which shall be selected from among the administration of justice offerings or concurrent to the area of emphasis with the approval of the student's adviser.

Thesis or Field Project Reports. Students may take a total of 6 hours thesis or individual research and are encouraged to do so; however, only 3 hours may be counted toward the 36 hours required for the master's degree.

AJ 599-3 Thesis

AJ 591-3 Individual Research (Field Project Report)

Required Credit Hours. The administration of justice masters's degree pro-

gram requires the completion of 36 semester hours within which the requirements stated above must be met.

The program offers flexibility in the development of an individualized program geared to the student's occupational objectives.

Application forms for both the Graduate School and the Department of Administration of Justice must be separately submitted. Upon request to the center, application forms from the Graduate School and the center 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 Coordinator, 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. 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 chairman of the Department of Agribusiness Economics, Southern Illinois University at Carbondale, Carbondale, Illinois 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 Agribusiness Economics 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. M.S. degree students usually take 3-5 hours of research or thesis (a maximum of 5 hours permitted) and complete additional hours by taking courses in agricultural economics, economics, or business.

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 thesis or research hours, is required for an M.S. 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 usually take 4-6 hours of research or thesis and complete the additional hours by taking courses in their concentration or area of emphasis.

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 services.

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 chairperson of the Department of Agricultural Education and Mechanization, Southern Illinois University at Carbondale, Carbondale, Illinois 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 Services Concentration

The agricultural services concentration is designed to permit students who are engaged in agriculture as extension workers, as soil conservation employees, 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 thesis or research hours, is required for an M.S. degree with a major in agricultural education and mechanization with a concentration in agricultural services. 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 Industries

The Department of Animal Industries offers programs of study leading to the Master of Science degree with a major in animal industries. 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 Industries 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 three official transcripts of their records 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 industries. A maximum of two animal production related courses (AnI 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 School of Agriculture. Minimal requirements for students entering the master's degree program are: (a) meet animal industries undergraduate requirements; (b) minimal GPA of 2.7 ($A = 4.0$); (c) Chemistry 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 industries 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 chairman 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 industries may be obtained from the Department of Animal Industries, Southern Illinois University at Carbondale, Carbondale, Illinois 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 Graduate School, and must meet all Graduate School requirements for entry. 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 and the Graduate School. 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. candidates: (1) Each student must complete the five core courses, Anthropology 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 two terms, and must be completed by the end of the third term. Once the five 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. program. (2) Each student must complete one or more regular graduate-level courses or seminars in each of three subdisciplines of the student's choice (from among archaeological, linguistic, physical, sociocultural anthropology). (3) A further six hours of coursework will be assigned by the student's committee after consultation with the student. These six hours may include up to four hours of graduate credit to meet tool requirements, and may not include more than three hours of indepen-

dent study or thesis. No more than three hours of credit in Anthropology 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. Committee, Thesis, Research Paper. Each student in the M.A. 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 two 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 chairperson 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. 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 requirement. 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. 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. 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 Anthropology 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. 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. 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 three of the four major sub-fields of anthropology. Students who have completed the M.A. degree in this department are not required to take this examination. 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 five members of the graduate faculty, at least three of whom (including the chair) must be from within the department, and at least one from outside; the normal case will be four from within and one additional.

The requirements for the Ph.D. degree include the following. (1) Additional coursework 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. (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) Within a period not to exceed three years of full-time graduate work, administration by the committee of a three-hour special oral examination covering topical and geographical specialties. The student may not take the examination until two years of full-time graduate work have been completed, except by authorization from the dean of the Graduate School. In evaluating the examination, the committee may pass the student, fail the student but allow retaking of the examination at a later time, or fail the student and recommend dismissal from the program. (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 Anthropology 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 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 pro-

gram 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 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.

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 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 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 three of the departments of the biological sciences.
5. Submit a research paper.
6. Attend, for credit, at least one semester of seminar in three of the departments of the biological sciences.

Advisement

Guidance of students shall be by a program committee of three members, one 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 Botany, Microbiology, Physiology, 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 Pro-

gram in Biological Sciences, Life Science II, Room 148, SIUC, Carbondale, Illinois 62901.

Botany

The Department of Botany 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 botany 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 botany 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 botany (morphology, anatomy, taxonomy, genetics, plant physiology, and ecology).

The Department of Botany 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 Botany 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. in 1965. All areas of botany 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 botany 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 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, G.R.E. 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 Southern Illinois University at Carbondale.

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 10 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 Botany.

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 chairperson. 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 botany faculty. The advisory committee for the Ph.D. 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 10 to 20 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 two hours credit in botany seminars (Botany 580 or Botany 589), at least one of which must be in general seminar (Botany 580). All Ph.D. students must earn two hours credit in botany seminar (Botany 580 or Botany 589) every year of residence until admitted to candidacy and at least one credit each year must be in general seminar (Botany 580). It is strongly recommended that the student enroll in general seminar(s) 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 Botany 400 (Plant Anatomy) in their graduate degree program.

Appeals

Appeals for variations from the departmental graduate program must be presented in writing to the botany graduate faculty meeting as a committee of the whole. Appeals must receive approval from a majority of the total botany 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, (3) approval from graduate policies committee.

Student appeals for change of major adviser must be presented in writing to the botany graduate faculty meeting as a committee of the whole. Appeals must receive approval from a majority of the total botany 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 botany 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 botany 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 botany 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 candidate will be expected to show an understanding of the application of his or her formal work to his or her 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 botany, and the third will include questions in the student's outside minor field or secondary concentration within botany.

The entire written examination is to last no longer than 5 days and each part is to last no longer than 8 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 10 days nor later than 30 days following the passing of the written examination. The examination shall last at least 2 hours and no more than 4 hours and should be scheduled to allow attendance of a maximum number of the botany 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 botany (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 3 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.

Business Administration

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

Master of Business Administration

The Master of Business Administration degree program has as its basic objective the development of professional managers and executives to serve the needs of business, government, and other organizations and to prepare interested graduates for 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 program has been structured with flexibility so as to serve holders of baccalaureate degrees in business administration and those who hold degrees in other disciplines. The M.B.A. program is fully accredited by the American Assembly of Collegiate Schools of Business.

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.

1. Complete all admission requirements set forth by the Graduate School.
2. Complete the Graduate Management Admissions Test (Princeton test) and have the results of the test mailed directly to the associate dean for graduate programs, College of Business and Administration. Information regarding this test is available by writing to: Graduate Management Admissions Test, Educational Testing Service, Box 966, Princeton, New Jersey 08540.
3. An undergraduate cumulative grade point average of 3.00 is preferred, and no less than 2.5 grade point average is permitted for admission. These averages are calculated on a 4.0 scale.

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 33 semester hours of course work plus an acceptable thesis for which 6 semester hours of credit are assigned.

Students who enter the Master of Business Administration degree program without the necessary foundation courses in the common body of knowledge in 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 as much as 24 semester hours of acceptable course work, to satisfy this requirement.

The Master of Business Administration program course work to be taken beyond the foundation courses is determined on an individual basis in conference with the director of master's programs, College of Business and Administration. Candidates must satisfy requirements in the following areas: business policy, financial management, information systems, managerial accounting, marketing management, organizational behavior, and production/operations management.

The candidate may select an area of emphasis in accountancy, finance, management (personnel or production), or marketing. The candidate may also choose courses in a wide variety of areas of graduate study throughout the University.

Transfer Credit

Within limits imposed by the policies of the Graduate School, an incoming stu-

dent may receive transfer credit for up to six semester hours of equivalent course work if the courses were taken at an AACSB accredited graduate school.

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

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, if a student receives a third grade of *C* or lower in any course designated as a foundation course, that student will be automatically suspended from the program.

If a student receives a third grade of *C* or lower in any core or elective course not designated as a foundation course, that student will be automatically suspended from the program.

If, at the end of any semester or session, for any reason, a student has three outstanding recorded grades of *Inc* or *Def* remaining on the grade record, that student will not be deemed to be making "normal progress" and will be placed on probationary status. If, thereafter, the student has three 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. A letter to reflect the results of the meeting will be sent to the student with a copy placed in the student's file. This letter will in no way mitigate or diminish the requirements set forth in the policy noted herein.

3-2 Program

A 3-2 program within the College of Business and Administration is available to qualified transfer students and students majoring in areas other than business. The program permits a student to devote a part or all of the last year of undergraduate study to fulfilling the foundation course requirements for the M.B.A. degree. Upon completion of the requirements for the bachelor's degree, the student may apply for admission to the Graduate School and the M.B.A. program.

Students majoring in any discipline within the College of Business and Administration are ineligible for participation in the 3-2 program. For details contact the associate dean for graduate programs, College of Business and Administration.

Concurrent J.D. and M.B.A. Programs

A student who has been admitted separately to the School of Law and to the graduate program in business administration may apply for permission to study concurrently for both the Juris Doctor and the Master of Business Administration degrees. This permission must be requested from both the School of Law and the graduate program in business administration, 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 either for courses only in the School of Law or only in the Graduate School, or for courses in both units. A student registered for both law and graduate courses in the same term must enroll for a minimum of ten semester hours in law, and twelve 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 programs requires that the student successfully complete 81 semester hours of law courses and 36 semester hours of courses that meet M.B.A. requirements. In addition, the student must fulfill all other requirements of the School of Law, the Graduate School, and the program in business and administration for the J.D. and M.B.A. degrees.

Doctor of Business Administration

The Doctor of Business Administration 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

The application materials for those who meet Graduate School requirements for the doctoral degree are forwarded to the College of Business and Administration.

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 addition, students must provide a copy of their score on the Graduate Management Admission Test, a completed D.B.A. Personal Data form, and three letters of recommendation from persons most qualified to judge the academic potential of the applicant.

Degree Requirements

Students in the program must complete course work in certain foundation areas or demonstrate proficiency based upon prior academic work. A student who has completed successfully the requirements for the M.B.A. degree may ordinarily expect to meet the proficiency requirements in most foundation areas. The foundation work includes the following areas: financial and managerial accounting; management concepts and managerial and organizational behavior; business policy; intermediate micro and macroeconomics and managerial economics; financial concepts and financial management; the legal and social environment of business; marketing concepts and marketing management; production/operations management; information systems; quantitative business analysis; and operations research. 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 Southern Illinois University at Carbondale. 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 *DBA Policies and Procedures Manual* of the College of Business and Administration. 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 two 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 re-take 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 *DBA Policies and Procedures Manual* of the College of Business and Administration. The dissertation committee will approve the student's dissertation prospectus and monitor 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.

Master of Accountancy

The Master of Accountancy degree has as its basic objective the development of professional accountants to serve the needs of a variety of agencies including professional accounting firms, private industry, and governmental institutions. Students interested in doctoral study also would be prepared to pursue such advanced work. The Master of Accountancy (M.Acc.) degree is structured with flexibility to serve holders of baccalaureate degrees in other than business, or in business but not accounting, and those accounting undergraduates who desire more advanced study.

Additional information on admission and degree requirements can be obtained by contacting: Coordinator, Master of Accountancy Program, School of Accountancy, College of Business and Administration, Southern Illinois University at Carbondale, Carbondale, Illinois 62901.

Business Education

See Vocational Education Studies for program description.)

Center for the Study of Crime, Delinquency, and Corrections

(See Administration of Justice)

Chemistry and Biochemistry

Graduate courses of study leading to the Doctor of Philosophy and Master of Science degrees in chemistry are offered by the Department of Chemistry and Biochemistry.

General Requirements: All Graduate Degrees

Admission. Each student must either have an undergraduate major in chemistry (including items 1 through 5) or 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. General chemistry.
2. An advanced course (acceptable for an ACS-approved baccalaureate degree) in inorganic chemistry or biochemistry.
3. One year of organic chemistry (lecture and laboratory).
4. One year of analytical chemistry, including instrumental analysis.
5. One year of calculus-based physical chemistry (lecture and laboratory).
6. No less than a formal course of one year's duration in one of the following languages: French, German, or Russian.

Students may be admitted with deficiencies in the above areas, but must remedy them prior to obtaining an advanced degree.

Diagnostic Examinations. All graduate students admitted to the master's degree program in chemistry and biochemistry will be required to take diagnostic examinations on entering. This would include those students with master's degrees from foreign schools who are directed by the Graduate School into the department's master's program.

Each division will indicate its preference for using the ACS standardized examinations or an examination made up by the division to be used as a diagnostic examination. If internal examinations are used, they must reflect the range of material covered in the appropriate undergraduate text(s). Each division should designate and make known, in advance, the passing level for the examination in its area, whether the examination is an ACS or an internal examination.

The student must choose at least three areas in which to take the diagnostic examination.

The student must show proficiency in the undergraduate material in three areas of chemistry by either passing three diagnostic examinations or by earning a grade of *B* or better in the course designated by the division. The remedial work must be completed in two calendar years from the date of first registration.

Students who enter with a recognized master's degree generally do not have to take the above examinations and remedial courses; however, the admissions committee may require that a new student entering the Ph.D. program take one or more of these examinations as a condition of admission. Based upon the results, remedial coursework may be required by the graduate adviser or the student's graduate committee.

Graduate Level Formal Coursework Requirement. The minimum coursework

requirement of the Department of Chemistry and Biochemistry is as follows.

The graduate students must fulfill the core course requirement of their major division.

All graduate students in the master's program must take at least three semester hours of formal 500-level course work for credit in a divisional area other than their major area. (Chemistry 451a and b would substitute for six hours of 500-level material.)

All graduate students in the doctoral program must take at least six semester hours of formal 500-level course work in one or more areas outside of their major area. This includes the three hours required for the master's program. Three of these hours may be taken in another department in which case three semester hours of either 400- or 500-level material in that department will be required. (Chemistry 451a and b can substitute for six hours of 500-level material.) Students entering with a master's degree must take only three semester hours in this category.

Interdisciplinary studies. Students may choose to major in a combination of areas. In such cases, items listed in the 3 paragraphs above will be modified by agreement of the student's graduate committee and the graduate adviser.

All graduate students who enter with a baccalaureate degree must present departmental seminar (Chemistry 595) prior to receiving a master's degree or a master's equivalency and a total of two departmental seminars prior to receiving a Ph.D. degree. Graduate students who enter with a master's degree must present two departmental seminars prior to receiving a Ph.D. degree. (Note: master's degrees from some foreign universities are considered by the Graduate School as equivalent to a baccalaureate degree; students from these schools are initially admitted to our master's degree program and, hence, must present three seminars prior to receiving a Ph.D.)

Professional training. All students are required to take one hour of Chemistry 597 for credit each term that they are in residence. This applies no matter what type of support the student receives.

All coursework requirements spelled out by the division or the department should be clearly understood to be minimum requirements which may be added to by the student's committee.

Graduate School requirements on minimum hours of formal coursework must also be met. All 400-level and 500-level courses except those graded S/U count toward this requirement. It should be noted that the special readings courses (the Chemistry 594 series), which may include the literature search performed in preparation of a thesis or dissertation, also counts towards the hour requirement of the Graduate School.

Research Director Selection. Students should select their research directors no later than the end of their second semester in residence. Those entering with a master's degree are encouraged to do the selection during their first semester. The procedure to be followed is:

1. secure the proper form from the graduate student adviser.
2. discuss possible research projects with at least five staff members; have the form signed by the staff members consulted.
3. return the completed form to the graduate student adviser after the selection has been made.

Graduate Committee. As soon as a graduate student has selected a research director, a graduate committee is appointed.

The committee for students in the Ph.D. program consists of at least five members: the student's research director (chairman), one faculty member from the major field, one faculty member outside this area, one faculty member outside the department, and the chairman of the Department of Chemistry and

Biochemistry (ex-officio). Students in the master's degree program are not required to have a committee member from outside of the department. The student's research director via the department chairman, requests approval of this committee by the dean of the Graduate School. The student must obtain agreement from those faculty chosen to be on the committee before requesting approval of the committee by the chairman of the department. Once the committee has been appointed, changes in that committee, other than those caused by a faculty member's retiral, resignation, or prolonged absence from the University must have the approval of the student, the committee, the departmental chairman, and the dean of the Graduate School.

The functions of the graduate committee are:

1. plan and approve the student's program of study.
2. review the student's progress in courses and to suggest and approve changes in the program of study.
3. evaluate the student's progress in research from time to time and make appropriate recommendations.
4. to determine whether a student may continue towards a degree in our program; if the student is denied the committee must notify the department chairman, in writing, regarding the reasons for this decision.
5. read and evaluate the student's thesis or dissertation.
6. conduct required oral examination(s).

The student's committee must have been formed and have met to plan the student's program within six months of the date the student chose the research director. At this time, the progress and program form is completed and filed with the graduate adviser.

It is expected that the student's committee meet at least once a year to review the student's program. If the student's progress in course work or research is marginal or unsatisfactory, the research adviser must convene the committee to evaluate the student's progress and make appropriate recommendations. The departmental admissions committee may request such a progress report from a student's committee prior to approving continuation of support.

It should be noted that the committee may require preparation of a thesis even if previous approval of directly pursuing a Ph.D. had been given by the faculty.

Research Tools. There is no departmental requirement of a research tool. However, a student's graduate committee, taking into account the student's background and the requirements of the research area, may require a student to acquire one or more research tools (e.g. foreign language, computer programming, statistics, etc.). If the research tool requirement is French, German, or Russian it will be met according to foreign language requirements. Other research tool requirements will be fulfilled in a manner prescribed by the student's graduate committee.

Academic Average. The department conforms to the Graduate School policy for retention in the master's program. This policy states: "Whenever a student's grade-point average falls below 3.0, that student will be placed on academic probation. Any degree student who is on academic probation and has been on academic probation for at least one academic term, and who has accumulated six or more hours of C or its equivalent, unbalanced by A in graduate level (400 or 500) courses taken at SIUC, will be dropped from the Graduate School and would not again be admissible to a degree program".

An average of 3.25 ($A = 4.00$) is required, as a minimum, for admission to the Ph.D. program. No course in which the grade is below C counts toward the degree; however, the grade does count in the student's average. A student admitted to the Ph.D. program is required to maintain a grade point average of at least 3.25.

Renewal of Support. Graduate students should be aware that renewal of support whether it be in the form of a teaching assistantship or a research assistantship is contingent on satisfactory evaluation of the student's performance and on 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 coursework and research.

Evaluation of Graduate Student Progress. In addition to the evaluation of progress by the student's graduate committee, the faculty meeting as a committee-of-the-whole will review all graduate students at the end of their first academic year in residence. For students who enter with a baccalaureate degree the faculty recommendation will be one of the following:

1. termination (giving cause).
2. continuation in a terminal M.S. program.
3. continuation in the M.S. program with the option of petitioning to enter the Ph.D. program after preparation of a thesis.
4. continuation in the M.S. program with the option to request the director of graduate studies to petition the Graduate School to grant a master's degree equivalency. This petition is filed when all requirements for master's degree are fulfilled except writing a thesis. If granted, the student may apply to enter the Ph.D. program without preparing and defending a thesis. An example of the student's scientific writing, such as a research report, is included with the petition.
5. requesting the director of graduate studies to petition the Graduate School to allow direct entry in the Ph.D. program. Such a request can be made after one semester in residence.

For students who enter with a master's degree the faculty can recommend: termination (giving cause) or continuation in the Ph.D. program.

Master's Degree Requirements. Students must fulfill both the Graduate School and Department of Chemistry and Biochemistry requirements to receive a master's degree. The former are specified in the Graduate Catalog. A general summary of the requirements of both units is:

1. fulfill diagnostic examination requirements.
2. fulfill divisional core course requirements.
3. satisfy the formal coursework requirement.
4. satisfactorily complete total of 21 hours of formal coursework at the 400/500-level. (Note: formal coursework is that which contributes to the Grade Point Average, i.e., excludes courses graded S/U).
5. earn a total of 30 hours of credit at the 400-500-level, at least 15 of which are at the 500-level. At least 27 hours must be in chemistry unless a student has taken an outside minor; in this case at least 20 hours must be in chemistry.
6. maintain at least a 3.00 Grade Point Average.
7. attend weekly seminars and earn one credit of Chemistry 595 by presenting a department seminar.
8. earn a minimum of 8 hours in research and thesis (Chemistry 598-599).
9. satisfy any research tool requirement given by the student's graduate committee.
10. prepare and present a thesis on the research carried out.
11. schedule and pass a final oral examination. Copies of the thesis must be presented to members of the graduate committee at least one week prior to the examination.

Ph.D. Degree Requirements. Upon completing a master's degree or receiving a

master's degree equivalency, the student must apply through the Graduate School for admission to the Ph.D. program.

The admissions committee of the Department of Chemistry and Biochemistry will determine whether the recommendations of the faculty have been followed prior to approving admission to the Ph.D. program.

After one semester in the M.S. degree program, a student may request that the department petition for admission into the Ph.D. degree program via the accelerated entry option. The following criteria shall be used to evaluate the student's qualifications for entry into the Ph.D. degree program via the accelerated entry option—a graduate GPA of at least 3.60, fulfillment of the departmental placement examination requirement, and substantive evidence of research ability. The last point must include the demonstration of an ability to communicate research results.

Admission to the Ph.D. degree program directly from the baccalaureate degree is possible in certain cases. To be considered for this route, students must have completed an undergraduate major equivalent to the American Chemical Society-approved curriculum and have experience beyond the minimum baccalaureate degree requirement. This experience may be undergraduate research, graduate-level course work, or advanced undergraduate-level course work in chemistry or a related area which is beyond that required for the ACS-approved degree. Students admitted to the Ph.D. degree program via this route must take placement examinations and complete all requirements for a master's degree, except thesis, in addition to the specific requirements of the Ph.D. degree program.

After being admitted, students in the Ph.D. program must:

1. fulfill divisional core course requirements and other coursework requirements.
2. complete a course of study as determined by the graduate committee.
3. earn two hours credit in seminar (Chemistry 595) beyond the master's degree requirement, and attend weekly seminars. One hour of credit is earned by a seminar presented on the topic of the research proposal described below. The second hour of credit is earned by a seminar on the dissertation.
4. earn a minimum of 32 hours in research and dissertation (Chemistry 598 and 600). A minimum of 24 hours must be dissertation credit (Chemistry 600).
5. pass cumulative examinations:

Students in the Ph.D. program must begin taking cumulative examinations no later than when the divisional core course requirements are completed. Beginning the examinations earlier is encouraged and may be required by the graduate committee.

Students must declare their intention to begin taking the examinations to the coordinator of the cumulative examinations at least one week prior to taking their first examination. Thereafter, the examinations must be taken consecutively.

Students may elect to take cumulative examinations in their major areas only, or to take cumulative examinations in different areas. If students elect the latter course of action, they must so inform the graduate adviser at the time that they select their research directors of this intention to pursue a cross-area curriculum. It is the responsibility of the student's graduate committee to determine how the cumulative examinations are to be divided among the areas. However, in no case can the total cumulative examination requirement be less than stipulated below.

Ten examinations are to be given each calendar year with four examinations respectively in the fall and spring semesters and two examinations in the summer semester. Cumulative examinations may be written examina-

tions not to exceed two hours in length. Take-home examinations, laboratory examinations, or oral examinations may be substituted for a written examination. All areas will give their written examinations simultaneously. The time and place for the examination will be posted at least ten days in advance. The subject of an examination may be announced in advance of the examination.

Students must pass four examinations in no more than ten trials in order to continue for the Ph.D. degree. Students must take consecutive examinations. They are not liable for examinations during any time when not enrolled in school.

Each examination is to be prepared, administered, graded, and recorded by one member of the faculty who will determine the pass-fail line on that examination. Each student taking the examination will be notified in writing whether the examination was passed or failed. One copy of this notification will be filed with the graduate adviser and a second will be placed in the student's file by the cumulative examination coordinator.

6. prepare and defend a research proposal, which shall serve as the preliminary oral examination requirement. The specific procedure shall be as follows: the student chooses the topic for the proposal, but it must be formally approved by the proposal evaluation committee (PEC). The topic may overlap the dissertation research project, but the proposal must be original. The PEC will consist of the student's graduate committee minus the member from outside of the department. The DEO, if serving on the graduate committee as an ex officio member, will be a nonvoting member of the PEC. The research director will chair the committee. The process of preparation of the research proposal will be started at the same time as the cumulative examination. After approval of the topic, the student will prepare a written proposal in accord with the prescribed format. During the preparation, the student may obtain advice and suggestions from any faculty member. Upon completion, the student shall submit the written proposal to the PEC for formal evaluation. The committee is allowed 30 days for the evaluation. This process will include at least one meeting of the committee. The evaluation shall be by a numerical score: from 1 (lowest) to 4 (highest) in half-integers. An average score of 3.0 shall be required to pass. The scores will be accompanied by a written review by each voting PEC member. If the grade is less than 3.0, the proposal must be revised and resubmitted within 30 days. The re-evaluation will follow the same procedure. Only one re-submission is allowed. A second failure will be reported in writing within 24 hours by the PEC to the department chairman and director of graduate studies. The latter will request that the Graduate School terminate the student from our program. Within 30 days of receiving notification of a passing grade, the student shall schedule an oral defense of the proposal. The defense will be conducted by the entire graduate committee. The graduate committee may grant an extension of time not to exceed 30 days. If the student and the graduate committee cannot arrive at a mutually acceptable time, the oral defense will be scheduled by the department chairman. Copies of the written proposal and the written evaluations by the PEC will be provided to all members of the graduate committee at least one week prior to the oral examination. Only one attempt is formally allowed to pass the preliminary oral examination (defense of the research proposal); however, if the committee cannot decide whether to pass or fail the student at the end of the first scheduled examination, they may vote to continue the examination at a later date. Only one such continuation is allowed. The decision of the committee to pass the student or to continue the examination requires that the committee, with at most one exception, votes affirmatively. The student will be notified in writing within 24 hours of the examination whether the result

was a) pass, b) fail, or c) continuation. The continuation of the examination, if so required, must be scheduled no earlier than 30 days and no later than 90 days after the initial examination. The continuation shall be scheduled in the same manner as the first preliminary oral examination. If a decision has been reached by the committee to fail the student, this should be communicated in writing within 24 hours to the department chairman and to the director of graduate studies as well as to the student.

7. maintain a 3.25 grade-point average.
8. demonstrate competence in a research tool, if this is required by the student's committee and if this requirement was not fulfilled during previous graduate studies. This requirement must be fulfilled prior to scheduling the preliminary oral examination.
9. complete a dissertation following the specifications set forth by the Graduate School.
10. schedule and pass a final oral examination (defense of dissertation). Copies of the dissertation must be distributed to the members of the graduate committee at least one week prior to the examination.

Compliance with the above regulations will be monitored by the graduate student progress committee, which shall be named yearly by the chairman, Department of Chemistry and Biochemistry.

Formal admission to Ph.D. candidacy is requested after the student successfully completes requirements 1-8. The request is made in writing by the student's graduate committee to the dean of the Graduate School through the department director of graduate studies.

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 coursework is available in the areas of theory, history, and scriptwriting; through the School of Art, coursework in the other fine arts is also available. A distinguished faculty of twelve, 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 one of the two concentrations offered in the degree program. This evidence will ordinarily consist of a portfolio of photographs or one or more films. In addition, applicants must arrange for three 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 Southern Illinois University at Carbondale. 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 Cinema and Photography 310, 311, 320, and 322. It is recommended that students wishing to emphasize in cinema have a course-work background equivalent to Cinema and Photography 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 two 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 chairperson 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: 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 Cinema and Photography 598 required).

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

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

Coursework 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 sixty 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; Anna State Hospital; 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 chairperson, Department of Communication Disorders and Sciences, Southern Illinois University, Carbondale, Illinois 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 setting. 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.

Doctor of Philosophy Degree

Students, after consultation with their academic advisers, are expected to propose to the graduate faculty of the department the academic program they intend to pursue prior to taking the preliminary examination for admission to candidacy. 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. Graduate faculty approval of the proposal 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 or;

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 of any specific degree requirement.

Preliminary Examination. After satisfactory completion of a majority 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 shall be written and administered by no fewer than 5 graduate faculty members representing the area of emphasis, cognate, and research interests. Should students fail the first examination, they may, with faculty approval, repeat the examination once within a 12-month period.

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 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 five 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 three upper-division courses in the social sciences with a *B* grade or better, three 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 two 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 Southern Illinois University at Carbondale 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 totalling 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 forty-four credit hour program consists of a core curriculum, including a supervised field internship, a minor or area of emphasis, and one of four 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 five 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 nine hours in the regular minor (for extended minor).

Other Course Requirements

(14 semester hours)

a. Minor (9 semester hours): at least nine 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 coursework, 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 comple-

tion: one for the program, one for the thesis committee chairperson, and two 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 chairperson, 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 chairperson, and one for the dean of the Graduate School.

Extended Minor (14 or more credit hours). The extended minor consists of five hours of course work outside of community development courses in addition to the nine hours of courses required for the minor. Since the student has five 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 chairperson, 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 coursework 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 Southern Illinois University 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 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 1970's 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 Southern Illinois University at Carbondale 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 ten 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 1960's, the need for trained commu-

nity 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 six 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 Office of Student Work and Financial Assistance.

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 Graduate School.

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 will be based on information from the application form, transcripts, grade point average, letters of recommendation, computer science courses and experience, and background in related areas. Applicants are expected to have a substantial background in undergraduate computer science courses including knowledge of and experience in at least one high level programming language (preferably Pascal), assembly language programming, data structures, computer organization, discrete structures as well as calculus. Other undergraduate coursework may have to be taken on a deficiency basis depending on the applicant's background.

General Requirements. A minimum of 30 hours of graduate credit must be completed of which at least fifteen has to be at the 500 level. More specifically, every candidate for the Master of Science degree in computer science must take:

1. CS 411 and CS 451
2. one approved graduate level mathematics course

3. four 500 level computer science lecture courses.

In addition, the courses taken must include one from each of the three categories: computer systems/architecture, information systems/software, and theory. The department maintains a current listing of all the courses in these categories as well as a listing of approved mathematics courses. Graduate students are also expected to attend, on a regular basis, the colloquia sponsored by the department.

Research Requirements. Students are required to write a research paper or the thesis carrying credit under CS 592 or CS 599 respectively. The option chosen requires departmental approval. In the research paper option a maximum of 3 credit hours from courses CS 590, CS 592, CS 599 may count towards the 30 credit hours.

After completion of all work, the student will be given a final oral examination over the thesis or research paper and other coursework.

Curriculum, Instruction, and Media

The Department of Curriculum, Instruction, and Media 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, Instruction, and Media, 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 Southern Illinois University at Carbondale 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 CIM courses: 438, 439, 440, 442, and 435 or 445. Other courses in the utilization and administration of teaching materials are 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 nine semester hour professional core, specialty area courses, and research. This professional core is as follows: Introduction to Curriculum (CIM 503); Systematic Approaches to Instruction (CIM 504); and Research Methods in Education (CIM 500). The specialty area courses consist of either 23 semester hours plus a research paper or project, or 17-20 semester hours plus a thesis (three to six 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 three persons selected by the student and the adviser. The adviser (chairperson) 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 three-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 three persons to prepare and evaluate the final comprehensive examination. The student may take the final comprehensive examination no more than three times.

If the student chooses to satisfy the research requirement by preparing a research paper, a coordinating committee of three 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 two 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 two weeks prior to the date desired for that examination.

Specialist Degree in Curriculum and Instruction

The Department of Curriculum, Instruction, and Media 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 six 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 three professors will be appointed to design the program cooperatively with the student, supervise the field study, and administer a comprehensive oral examination. At least one 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; 14-17 semester hours of specialization; and two to six semester hours of independent investigation/research, for a total of 30 semester hours. The specialty area semester hours are determined by the student and the advisory committee. The professional core of courses is as follows: Instructional Theory, Principles, and Practices (CIM 583); Curriculum Theory, Foundations, and Principles (CIM 584); Integration of Educational Media (CIM 554); and Supervision for Instructional Improvement (CIM 585B).

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 chairperson.

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

The CIM requirements include a core of nine semester hours; at least 23 semester hours in the selected specialty area; research tool(s) usually totaling eight semester hours or the equivalent (hours for research tool(s) are not counted in the total of 64 semester hours); and a minimum of 24 semester hours of dissertation. An internship of two to eight 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: Instructional Theory, Principles, and Practices (CIM 583); Curriculum Theory, Foundations, and Principles (CIM 584); and Advanced Research methods in Education (CIM 582).

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 eight 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 three times a year: Wednesday, Thursday, and Friday of the fifth week of each term. A student may take the examination no more than three 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 three weeks in advance of proposed defense.

The Department of Curriculum, Instruction, and Media 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 in economics. In order to provide students with the broadest types of experiences both programs combine a central core of economic theory and applied econometrics with offerings that emphasize both the applied and theoretical aspects of ten different fields of specialization. In addition to their breadth, both the master's and doctoral programs also require varying degrees of specialization so that all students have at least one area of expertise. The 12 month master's program prepares a student for either the doctoral program or a terminal degree that is sought by both private industry and government. After completing this program a student wishing to continue graduate education takes an additional one to two years of course work and doctoral exams and usually spends one more year writing a doctoral dissertation (i.e., two to three additional years past the master's degree).

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. Calculus is also required and used extensively.

Separate application forms must be submitted to the Department of Economics and to the Graduate School. Application materials may be obtained from: Director of Graduate Studies, Department of Economics, Southern Illinois University at Carbondale, Carbondale, IL 62901.

All applicants are required to 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: Economics." All exam scores must be received before admission.

Evaluations of applicants by the departmental admissions committee 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.

Finally, all 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 applicant score 550 or above for admission to the graduate program. The TOEFL must be taken no more than 12 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.

International students need not take the Graduate Record Examination prior to admission if the director of graduate studies in economics deems that this would place an undue hardship upon the applicant. It is in the student's best

interest to do so, however, since the Graduate Record Examination is required upon matriculation.

Entry into Ph.D. Program. There are three routes by which a student may enter the doctoral program. In the past, the standard method was through completion of the requirements for a master's degree and maintaining an average of at least 3.25 ($A = 4.0$). This is still an option. Now, however, there are two alternatives available, at least for some students.

Direct Entry. Direct baccalaureate degree entry into the program for the doctoral degree in economics is possible upon recommendation of the faculty. For direct entry, the student must meet Graduate School admission requirements and should have earned a grade point average of 3.0 or better ($A = 4.0$) on all undergraduate work, or have exhibited some other indication of the ability to do doctoral-level work in economics, such as GRE performance in the upper quartile. Application for direct baccalaureate degree entry should be made to the director of graduate studies in the Department of Economics.

Accelerated Entry. After at least one semester in residence, a student enrolled in the M.A./M.S. program may petition the graduate studies committee for accelerated entry into the Ph.D. program. The essential requirement for accelerated entry is that a student must be already prepared to begin research at the doctoral level. There must be substantive evidence of research or creative activity already carried out by the student (e.g., papers, publications, performances, or other evidence as appropriate to the discipline). Furthermore, the student should have demonstrated the ability to communicate effectively the results of such activity. 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. If admitted, the student will proceed toward the Ph.D. in accordance with the established rules of the department and the Graduate School.

Master's Degree

The master's degree prepares the student for teaching in junior college, or for positions in government or business.

The degree is awarded after the following requirements are fulfilled.

1. Pass courses in Econ 465 Mathematical Economics, Econ 540a Microeconomic Theory, Econ 541a Macroeconomic Theory, Econ 467 Introduction to Econometrics, and Econ 565 Applied Econometric Analysis.
2. Pass two courses in a field of specialization in either economics or a field outside economics having a reasonable connection with economics, approved by the director of graduate studies.
3. Write a research report (3 credits) or master's thesis (6 credits).
4. Have earned 30 credits, at least 15 of which must be at the 500 level and at least 21 of which must be in economics.
5. Have earned a 3.00 G.P.A. in 400 and 500 level economics courses excluding Economics 425, 436, 441, 471, 525, and 598.
6. Pass an oral examination.

The typical master's degree program will include: for the fall semester microeconomics (Econ 540a), econometrics (Econ 467), and a field elective; for the spring semester macroeconomics (Econ 541a), econometrics (Econ 565), and a field elective; and for summer a thesis or research paper and an elective.

Doctor of Philosophy Degree

The Ph.D. degree prepares the student for teaching and research positions in the academic world, for positions as senior economist in private industry, for posi-

tions with private research or consulting organizations, or for government positions requiring advanced economic training.

The degree is awarded for high accomplishment as evidenced by the following steps.

1. Demonstrating proficiency in econometrics as a research tool through successful completion (minimum grade of *B*) of Econ 467 and Econ 565.
2. Demonstrating proficiency in a second research tool, chosen with the prior consent of the director of graduate studies.
3. Pass Mathematical Economics I (Econ 465) and either History of Economic Thought (Econ 450) or The History of American Growth in the 20th Century (Econ 420).
4. Earn 24 credits after the master's degree or the equivalent.
5. Passing written qualifying examinations in macroeconomic and microeconomic theory after completion of appropriate coursework for credit.
6. Passing examinations in two specialized areas of economics after completion of appropriate coursework for credit and with the prior consent of the director of graduate studies. This is in addition to passing two courses in a third, untested, field of specialization approved by the director of graduate studies.
7. Completion of a dissertation based on original research and successful defense of the dissertation before a faculty committee.
8. Take 24 credits of Dissertation (Econ 600).

The typical doctoral program for the first year will be the same as the typical master's degree program. The second year will include: for the fall semester microeconomics, macroeconomics, field; for the spring semester microeconomics, elective field; and for summer electives. The electives will be used for each student to fill the degree requirements in the way best suited to them. The third year will be used for the completion of the dissertation.

Approved Fields

The Department of Economics currently recognizes the following fields of specialization: economic development, international economics, monetary economics, advanced economic theory, econometric theory, public economics, resource economics, and labor economics. For the third, untested, field of specialization for the Doctor of Philosophy degree, the Department of Economics recognizes the fields of agricultural economics, business economics, or any other area having a reasonable connection with economics and having the prior approval of the director of graduate studies.

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, occupational education, physical education, and special education.

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. Educational administration and higher education are offered through the Department of Educational Administration and Higher Education. Curriculum and instruction is offered through the Department of Curriculum, Instruction, and Media. Occupational education is offered through the Department of Vocational Education.

Studies. The remaining concentrations are housed in departments having the same title as the concentration: educational psychology, health education, physical education, and special education.

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 five 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 eight 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 three 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 completion of the doctoral seminar sequence in education. A student who fails the examination on the initial attempt may take the examination two 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 two doctoral seminars, Education 590 and 591, fulfilled the residency requirements for the doctoral degree (see degree requirements in Chapter 1), met the research tool requirement, and passed the preliminary examination. The doctoral committee chairperson 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 chairperson who is authorized to direct doctoral dissertations and at least four 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 chairperson 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

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, coursework 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.

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, CIM 531, or CIM 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 two years of successful teaching experience prior to or concurrent with the coursework.

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. A basic core representing a minimum of nine semester hours of coursework is required. These courses are: EAHE 495, Workshop in Adult and Community Education; EAHE 535, Organization and Administration of Adult and Community Education Programs; and EAHE 500, Educational Research Methods (or its equivalent). The remaining coursework to satisfy the thirty semester hour concentration may be selected from one of the following areas: administration, classroom instruction, and continuing education in post-secondary institutions. The specific program of courses is arranged in consultation with the graduate adviser.

Specialist Degree

The Specialist degree major, educational administration, is structured on a 30 semester hour sequence which requires: six semester hours in advanced administration seminars, EAHE 551 and 553; four semester hours in an administrative internship, EAHE 595; and three 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 coursework 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 requirements, such as a minimum of nine semester hours in foundations of education coursework in their total graduate program, a field study, and six 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 eleven 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 six 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.

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 Miller Analogies Test (MAT) or 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, Illinois 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 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 one course in each of the following three 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 applications 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. 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 Graduate School through the usual admission channels. In addition, application is also made to the chair, Department of Educational Psychology, Southern Illinois University at Carbondale, Carbondale, Illinois 62901, (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 or those from the Miller's Analogies Test 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.

Engineering

The College of Engineering and Technology teaching and research programs are supported by appropriate courses, equipment, and facilities in a modern building assigned to the college. In addition, research opportunities and funding are provided through the Coal Research Center, the Materials Technology Center, and the Office of Research, Development, and Administration. Also the college operates the College of Engineering and Technology Applied Research Center (CETARC). Large sponsoring agencies such as major corporations or technical associations may ask the college to conduct research of a basic nature in order that they may devote their own laboratories to work of a developmental character. Small organizations may call on the college for more direct help in the solution of specific problems. Graduate programs leading to the Master of Science degree with a major in engineering and the Doctor of Philosophy degree in engineering science are available in the College of Engineering and Technology.

Master of Science in Engineering

The Master of Science degree with a major in engineering is available for three concentrations in the three engineering Departments of Civil Engineering and Mechanics, Electrical Engineering, and Mechanical Engineering and Energy Processes. Course offerings and research activities within the departments include:

CIVIL ENGINEERING AND MECHANICS CONCENTRATION

Topics included are: numerical fluid and solid mechanics, mechanics of composite materials, continuum mechanics, experimental stress analysis, biomechanics, stability, photoelasticity, water quality control, hazardous waste treatment and disposal, hydraulic design, viscous and inviscid flow, wave motion, turbulence, structural analysis, and structural design.

ELECTRICAL ENGINEERING CONCENTRATION

Topics included are: circuits theory, electronics, solid state devices and materials, digital systems, energy sources and conversion, computers and automation, bioengineering, systems analysis and design, automatic controls, communication theory, instrumentation, and electromagnetics, and quantum electronics.

MECHANICAL ENGINEERING AND ENERGY PROCESSES CONCENTRATION

Topics included are: air pollution control, mass and heat transfer, coal conversion, electrochemical desulfurization, thermal science, thermal systems design, solar systems design, chemical and biochemical processes, mechanical systems, computer-aided design, materials science, and catalysis.

Master of Science in Mining Engineering

Topics included are: 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 economics and operations research, surface mine reclamation.

Admission

Students seeking admission to the graduate program in the College of Engineering and Technology must meet the admission standards set by the Graduate School and the department they wish to enter. Some departments require a bachelor's degree in engineering or its equivalent for admission into the program whereas others require a bachelor's degree with a major in engineering, mathematics, physical science, or life science with competence in mathematics. A student whose undergraduate training is deficient may be required by the department to take coursework without graduate credit.

Requirements

A graduate student in engineering is required to develop a program of study with a graduate adviser and establish a graduate committee of at least three members at the earliest possible date. Each student is required to concentrate in one of the branches of engineering, and with the approval of the graduate committee, may 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 within the major 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 major department including no more than three semester hours of the appropriate Engineering 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 approval of the chairman of the department administering the concentration. The committee must consist of at least one member from one of the other three 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 programs, courses, assistantships, and fellowships may be obtained from the College of Engineering and Technology or any one of the four engineering departments.

Doctor of Philosophy in Engineering Science

The Doctor of Philosophy degree in engineering science is available for three concentrations in four engineering departments. The areas of concentration are as follows:

AREAS OF CONCENTRATION

Mechanics (solids, fluids, and materials.) This area provides students with in depth knowledge in solid mechanics, fluid mechanics, structures, experimental stress analysis, soil and rock mechanics, mine ground control, and materials science. A student may select coursework from over 75 semester hours of existing 500-level engineering courses. Additional relevant courses may be taken in physics, mathematics, and geology. Research thrusts include finite element analysis of structures, water jet cutting of materials, mechanical characterization of composite materials and rocks, solid-liquid separation mechanics, field geotechnical studies in underground mines and tunnels, surface and sub-surface effects of mining, metallic glasses, surface and interface phenomena.

Fossil Energy (mining, coal conversion, coal utilization, and pollution control.) A student with interests in fossil fuel extraction and utilization and associated environmental problems may specialize in this area. Typical coursework includes mining, processing, combustion, and conversion of fossil fuels as well as environmental problems abatement associated with fossil fuels. Over 45 semester hours of engineering coursework at the 500-level are currently available. Other relevant courses in this area may be taken in physics, chemistry, and geology. Current areas of research include desulfurization of coal using a multitude of physical and chemical processes, recovery of coal from waste materials surface-mined land reclamation, systems simulation of coal mining, coal conversion, and fluidized bed combustion. A new area of abatement of environmental pollution emanating from these processes has also been developed.

Electrical Systems (electromagnetics, properties, and instrumentation.) A student interested in advanced study in this area of concentration may select from the following areas: control and system theory, instrumentation, and digital systems, solid state devices, and electromagnetics. Approximately 28 semester hours of electrical engineering coursework at the 500-level are currently available. An additional group of courses at the 500-level is available in the Departments of Computer Science, Mathematics, and Physics. Current research in this area includes electromagnetic properties of rock strata, lightning protection equivalent circuits for lightning, microwave instrumentation, computer applications, fiber optics, control and network theory and systems.

ADMISSIONS AND RETENTION

Admission to the doctoral program requires a master's degree in engineering or its equivalent. Applicants for the doctoral degree must meet Graduate School admission requirements and be approved by the college graduate studies committee. In addition to the Graduate School and other college requirements, the committee ordinarily requires a grade point average of 3.5 (4 point scale) in graduate level work. Applicants are required to submit GRE scores in support of their application for admission. Except for persons from English-speaking countries, international students are required to have a TOEFL score of 600 or higher for admission.

Upon admission to the doctoral program, an interim graduate adviser will be assigned for each student by the college associate dean for graduate studies. This adviser will be responsible with the student for planning the coursework portion of the program. The college graduate studies committee will be kept informed of the student's program of study.

Transfer credit will normally be given for some of the graduate level courses suitable to the program upon review by the college graduate studies committee. Proficiency examinations may be authorized by the committee for areas in

which questions of transfer credit arise. No credits will be given for industrial experience.

Notwithstanding the number of credits transferred towards the Ph.D. program, every student must complete at least 18 credit hours of approved coursework at Southern Illinois University at Carbondale prior to taking the candidacy examination.

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 assistant appointment, and a student holding a graduate assistant appointment is subject to having the appointment terminated upon acquiring two or more incomplete grades.

CURRICULUM

A minimum of 38 credit hours of coursework and 24 credit hours of dissertation research is required. The coursework must be completed in two areas: area of concentration and program core. A student must complete a minimum of 18 hours of coursework relevant to an area of concentration. The coursework in this area will consist of courses in engineering, mathematics, or science. A minimum of 12 hours of electives must be taken in 500-level courses. Of these, a minimum of 9 hours must be taken in 500-level courses in engineering science. The coursework in the area of concentration is intended to provide depth in the student's area of research. The program core consists of 20 hours of coursework in systems theory, design of engineering experiments, experimental data acquisition- theory and practice, advanced numerical methods in engineering, advanced engineering analysis (I and II), and engineering science seminar. A dissertation must be completed in the student's area of research interest with the approval of the dissertation committee.

CANDIDACY

A Ph.D. student must satisfy all graduate school requirements. Acceptance to Ph.D. candidacy is contingent upon the successful completion of written examinations composed of questions that require substantive knowledge of experimental and theoretical topics in the program core and elective courses. However, questions are not limited to post-M.S. coursework. The examinations are designed to evaluate the breadth and depth of the student's education, to encourage the student to organize and integrate knowledge, and to demonstrate the student's competence. The examination in the program core area will be the same for all students taking the examination at any one time. The examination in the area of concentration will vary depending upon the student's area of research. Each student is expected to pass the candidacy examination the first time it is taken. If a student fails to pass any component of the candidacy examination, the college graduate studies committee and the student's candidacy committee will review the student's examination performance, academic progress, and potential for successful completion of the degree. The joint committee will decide which examinations the candidate must retake or it may decide to terminate the student's enrollment. In any event, the student will not be permitted to take the examination in any area more than twice.

DISSERTATION

A dissertation must be written under the direction or co-direction of an engineering faculty member and approved by dissertation committee consisting of a minimum of 5 members one of whom must be from outside the College of Engineering and Technology. The dissertation committee must be formed no later than immediately after successful completion of the candidacy examination. The members of this committee need not be the same as the members of the candidacy examination committee.

A dissertation research proposal must be approved by the dissertation committee. Candidates will be required to present an acceptable dissertation describing original research performed with minimal supervision. Dissertation approval is based on a successful oral defense of the dissertation research and approval of the dissertation. This requires approval of at least 80% of the dissertation committee.

GRADUATION

1. All requirements of the Graduate School must be met.
2. A minimum of 38 hours of coursework beyond an M.S. degree in engineering, or its equivalent, must be completed with a minimum grade point average of 3.25.
3. An acceptable dissertation must be completed within 5 years after admission to candidacy or the student will be required to repeat the candidacy examinations.

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, Illinois 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 English 595, 600, and 601 are not included in the above regulations.

Coursework

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. 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 composition.

LITERATURE CONCENTRATION

The literature concentration requires students to take the following courses:
Eng 502-3 Introduction to Graduate Study and Teaching College Composition
Eng 403-3 History of the English Language or
Eng 401-3 Modern English Grammar

Electives covering the historical literary periods: six English or American literary period courses for 18 hours credit- three from Group I and three from Group II:

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.

Additional Electives. The student may use the remaining 9 hours of the 30 hours of graduate work required for the M.A. with literature concentration degree as follows: a. nine hours of graduate-level credit courses in the Department of English, or b. a nine-hour area of emphasis in a special field: in the Department of English (such as creative writing, criticism, etc.); or interdisciplinary study outside the department (in such areas as linguistics, foreign language, journalism, philosophy, history, etc.). With the approval of the director of graduate studies, such study will be entered as a special minor on the student's record. A *B* in all courses is necessary to qualify course work as an area of concentration. Some graduate students may need more than the minimal 30 hours

of credit for the master's degree if they wish to offer an area of concentration.

COMPOSITION CONCENTRATION

The composition concentration requires students to take 18 semester hours in the composition segment and 12 semester hours in the literature segment as listed below.

Required Courses.

Eng 401-3 Modern English Grammars

Eng 501-3 Research in Composition

Eng 581-3 to 9 Problems in Teaching English

Eng 502-3 Introduction to Graduate Study and Teaching College Composition

Electives. Composition segment: one course must be selected from each of the two areas.

Writing

Eng 490-3 Expository Writing

Eng 491-3 Technical Writing

Language and Rhetoric

Eng 403-3 History of the English Language

Eng 596-3 to 12 Language Studies

Spch 440-3 Language Behavior

Courses offered by departments other than English by permission of the director of graduate studies

Literature segment: four courses must be selected from four of the five areas: Medieval and Renaissance literature, Restoration and 18th century literature, 19th century literature, modern British literature, American literature.

Other Requirements. In addition, students in both concentrations must complete the following requirements.

Satisfy a foreign language requirement by completing with an average of not less than *B* two years of college-level work in one foreign language or FL488 a foreign language as 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.

Submit to the director of graduate studies two copies of a research paper which has been given a grade of not less than *B*. The research paper is to be typed according to Graduate School guidelines and the MLA Style Sheet. Students in the composition concentration must submit two copies of a research paper written for one of the courses in composition.

Students who have chosen the literature concentration must pass the master's comprehensive examination over six historical periods of literature. Students in the composition concentration must pass the master's comprehensive examination based on course work in both segments and a reading list.

Students who have opted to write a master's research project and who have received permission from the graduate studies committee to do so do not need to satisfy the last two requirements listed above. They will have to submit two copies of their completed research project to the director of graduate studies. The thesis must be typed to follow Graduate School guidelines and MLA Style Sheet.

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 Southern Illinois University at Carbondale. 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. 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 six months prior to the final examination on the dissertation.

Course of Study

There is no prescribed number of hours for the Ph.D. 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 six major fields (see M.A. course requirements) and English 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 two 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 one of the three 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 two 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 three 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 three 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 two 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 interdisciplinary 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 two or three years, respectively, after receipt of their M.A.

Preliminary examinations covering three areas are prepared and graded by the student's advisory committee, and will cover three areas. A major area examination consists of one six-hour written exam, the minor areas of two three-hour written exams. Preliminary examinations will be scheduled only twice in a single term.

At the discretion of the committee, a two-hour oral examination may follow the decision on the three 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 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 two 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 thirty semester hours are required, of which at least fifteen must be in 500-level courses. All students must take the appropriate course (FL 566, 567, or 569) in bibliography and research techniques, which should be taken as early as possible during the course of studies. 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 major 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—French

French 411-3 Linguistic Structure of French

or

French 412-4 History of the French Language

French 470-3 Backgrounds of French Civilization

French 510-3 Masterpieces of French Literature

French 525-3 Advanced Language Skills

The student will consult with the graduate adviser in determining a suitable program beyond those requirements, including FL 566, Bibliography and Research Techniques, for those who choose the non-thesis option.

GERMAN

A student seeking a Master of Arts degree with a major in German may emphasize either German language and linguistics or German literature; a minor must be completed in the other of these two fields. Although German 412-3, Linguistic Structure of Modern German is not required, it is strongly recommended for prospective teachers of German. Required courses are:

FL 567 Bibliography and Research Techniques—German

German 413-3 History of the German Language

One course in an older period of a Germanic language. (German 510-3, Middle High German, is recommended, but an alternative course could be German 512-2, Historical Germanic Dialects.)

SPANISH

The program of study leading to the Master of Arts degree with a major in Spanish is designed to survey at least two of the following: Hispanic linguistics, Peninsular literature, and Spanish American literature. Requirements are:

Courses: Spanish 412-3, FL 569-3

Theses or research paper: (Option 1 or 2 is required).

Option 1: If writing a thesis, either (a) 6 hours of Spanish 599 or (b) 3 hours of Spanish 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 chairperson 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 the thesis exams and also for the review and evaluation of the thesis. The advisory committee chairperson and at least one other member of the committee shall be members of the forestry department. The other member(s) 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 chairperson 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 chairperson, written plan for course work, and selection of tentative thesis areas all within first two 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 three 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, one for the chairperson of the advisory committee in addition to two 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 three 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 one 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 (Forestry 501) for two semesters for which they will receive one 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. Southern Illinois University at Carbondale 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 School 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: Geography 500-2, Principles of Research, during the first fall semester in residence; Geography 501-2, Seminar in Geographic Research, the following semester; Geography 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 masters 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 masters student enrolled in Geography 500. An approved program of study will be filed with the graduate program director and department chairman as part of Geography 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 Geography 599 Thesis or Geography 593 Research in Geography. A total of 4-6 credit hours of Geography 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 may be awarded for a research paper.
5. Submit a thesis or research paper to the advisory committee at least two weeks before the comprehensive examination. A student who writes a the-

sis 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 six 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 chairperson 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 Geography 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: Geography 500-2, Principles of Research during the first fall semester in residence; Geography 501-2, Seminar in Geographic Research in the following semester; Geography 510, Multivariate Techniques in Geography; and three 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 Geography 500, and provide advice for modifications. The graduate faculty will meet at the end of Geography 501 to approve/disapprove the program of study. An approved program of study will be filed with the graduate program director and departmental chairman as part of Geography 501.
5. Pass a comprehensive (preliminary) examination. Upon completion of program of study, the student will complete a written and oral comprehensive examination in two 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 one week or more than two 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 two 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 chairperson 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. 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 three 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; rarely will applicants 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 Southern Illinois University.

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 Geology 500. Other specific requirements will be determined by the student's advisory committee and the department chairman. 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.

Master's students are required to successfully complete Geology 542A in their first year and Geology 542B in the spring semester of their final year. Other 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 seminar, 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 chairman 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. 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 four different faculty members at SIUC, three of whom must be in the Department of Geology. Students in the Ph.D. program must successfully complete Geology 542B in their last year of residency. 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 four additional members, one of whom must be from a department other than geology; (2) demonstrated competence in at least one research tool* as evaluated by the advisory committee; and (3) presented themselves to the advisory committee for 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 within not less than 30 days nor more than 270 days. 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, shall be admitted to candidacy for the Ph.D. One additional research tool 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 five year period after admission to candidacy. Ordinarily, the doctoral student should expect to spend a minimum of two 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

*Two research tools are required. The research tool is a practical knowledge of a foreign language or a computer language.

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 three years post master's or master's equivalent. Requests for relaxation of this policy must be made in writing to the department chairman.

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 chairperson 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 chairperson.
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:

Candidates should be certified for teaching. Exceptions to this requirement may be appealed to the academic affairs committee of the department. Students enrolled in Health Education 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

The program in community health education requires a total of 40 semester hours, 8 of which must be gained through 12 weeks of practical field work experience. In addition to the common core courses (533a, b) of 8 semester hours required of all master's degree candidates, the community health education concentration requires Health Education 488, 489, and 500. A minimum of 2 semester hours in communications or group work methods is strongly urged.

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 chairperson of the Department of Health Education.

Higher Education

The Department of Educational Administration and Higher Education provides graduate study leading to the Master of Science in Education degree with a major in higher education and to the Doctor of Philosophy degree in education with a concentration in higher education.

Pre-service and in-service preparation is provided 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.

The Master of Science in Education Degree

The Department of Educational Administration and Higher Education offers four concentrations leading toward the Master of Science in Education degree in higher education: academic administration, fiscal affairs administration, college student personnel, community and junior college teaching. Students interested in one of these master's degree programs may obtain information

and advisement from the advisers of the respective programs through the Department of Educational Administration and Higher Education.

Application. Inquiries regarding application should be directed to the admissions clerk of the Department of Educational Administration and Higher Education. Each applicant must submit an application to the Graduate School. In addition, an applicant is required to submit to the Department of Educational Administration and Higher Education the departmental application form, an autobiographical statement, three letters of reference, and upon request, test results from either the Miller Analogies Test or the Graduate Record Examination.

Admission. Students applying for academic administration or for college and university business affairs should have had two years of full-time experience in higher education. Students applying to the fiscal affairs administration master's program may be required to have taken certain courses in or have attained at least one or more competencies related to fiscal affairs. Students considering student personnel program should show some evidence of interest or participation in student personnel programs as an undergraduate. Students applying for the specialty in community and junior college teaching are expected to have an undergraduate concentration in a subject area commonly taught in a community college.

Each applicant is considered for acceptance on an individual basis with much consideration being given to evidence showing the applicant's commitment to higher education as a field of study and as a career.

Retention. Each student works closely with an adviser for program preparation. Each student also has a committee which 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. In each of the specialties there are particular requirements that should be noted.

ACADEMIC ADMINISTRATION

Thirty-two semester hours (minimum)

Required Courses: 18 Semester Hours.

- 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 Teacher and College Teaching
- EAHE 535f-1 Academic and Faculty Administration or EAHE 535e-1 Academic Advisement
- EAHE 545e-2 Problems in Central Administration

An internship experience is required if an exception was made in waiving the pre-admission work experience. In addition, one or more professional competencies related to academic affairs are required.

FISCAL AFFAIRS ADMINISTRATION

Thirty-two semester hours (minimum)

Required Courses: 17 Semester Hours.

- EAHE 500-3 Educational Research Methods
- EAHE 513-3 Organization and Administration in Higher Education
- EAHE 518-3 College Teacher and College Teaching
- EAHE 528-3 Finance in Higher Education
- EAHE 535f-1 Academic and Faculty Administration
- EAHE 545e-2 Problems in Central Administration
- EAHE 545f-2 Business and Fiscal Affairs

An internship experience is required if an exception was made by waiving the pre-admission work experience.

One or more professional competencies related to college and university fiscal affairs are required.

COLLEGE STUDENT PERSONNEL

Forty semester hours (minimum)

Required Courses: 19 Semester Hours. Includes 2 hours of credit internship.

- EAHE 500-3 Research in Higher Education
- EAHE 508-2 Student Development Theories
- EAHE 515-3 College Student Development: Operations and Policies
- EAHE 516-3 College Students and College Cultures
- EAHE 454-3 Contrasting Philosophies of Education
- EAHE 595-2 Internship in Higher Education
- EPSY 502-3 Basic Statistics

An internship experience (paid) is required.

Students are encouraged to develop an interdisciplinary program preparing them in general student personnel administration or in one or more of the particular student services.

COMMUNITY AND JUNIOR COLLEGE TEACHING

Thirty-two semester hours (minimum)

Required Courses: 19 Semester Hours. Includes 2 hours of credit internship.

- EAHE 500-3 Research in Higher Education
- EAHE 508-2 Student Development Theories
- EAHE 515-3 College Student Development: Operations and Policies
- EAHE 516-3 College Students and College Cultures
- EAHE 454-3 Contrasting Philosophies of Education
- EAHE 595-2 Internship in Higher Education
- EPSY 502-3 Basic Statistics

An internship experience (paid) is required.

Students are encouraged to develop an interdisciplinary program preparing them in general student personnel administration or in one or more of the particular student services.

COMMUNITY AND JUNIOR COLLEGE TEACHING

Thirty-two semester hours (minimum)

Required Courses.

- Courses in the teaching specialty: 20 semester hours
- Courses in Higher Education: 12 semester hours
- EAHE 516-3 College Students and College Cultures
- EAHE 518-3 College Teacher and College Teaching
- EAHE 523-3 Curriculum Design and Policy
- EAHE 526-3 Community College

Recommended beyond the minimum requirements:

VES 466-3 Principles and Philosophies of Vocational, Occupational, and Career Education (for those planning to teach in an occupational program)

EAHE 500-3 Educational Research Methods

EAHE 595-2 to 6 Internship (when feasible)

An internship cannot be assured, but effort is made to provide such an experience when possible.

Research Requirements. Each student shall demonstrate research competencies through writing an acceptable master's thesis or a research paper. Students selecting academic administration or fiscal affairs are usually asked to write a thesis and to demonstrate research competencies as outlined by their committee. Students in college student personnel usually prepare research papers on a topic concerned with student development and related activities. Students in community and junior college teaching must submit an acceptable research paper on a topic in the teaching field with the approval coming from both the adviser in the Department of Educational Administration and Higher Education and the representative from 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 teaching field. In some instances, the student may wish to meet the thesis requirement instead of the research paper requirement.

Final Examination. All master's students are required to complete successfully a final examination which may be written or oral or both. Upon the successful completion of all requirements, including a *B* average for all coursework, the student is recommended to the Graduate School for graduation.

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. Students should consult their academic advisers about possible financial assistance including graduate fellowships.

Doctor of Philosophy Degree in Education

The Department of Educational Administration and Higher Education participates in the doctoral program in education with a concentration in higher education. See the description of the Ph.D. degree in education and contact the admissions clerk of the department for further details.

History

From a small beginning as a normal school, Southern Illinois University at Carbondale has become a major university with more than 22,000 students and approximately 1,500 faculty. Much of the growth has come since 1947, when the institution became a multipurpose and diversified university with many graduate programs.

In 1944, the Department of History inaugurated the Master of Arts degree which led to an increase in the size of its library resources by 1954. Fifteen years later, departmental planning culminated in the approval of the Ph.D. program in historical studies.

The Department of History now has a faculty of 17 members and 14 graduate assistants. About 40 students are working toward the M.A. and Ph.D. degrees. In 1985 and 1986 the University granted a total of 16 master's degrees in history and one doctoral degree.

Together with their continuing concern for teaching, the history faculty have engaged in a wide range of research projects. They have published broadly in scholarly journals and authored dozens of books. They have also served as officers of professional organizations, participated in international exchange programs, served as advisers to several university presses, and provided numerous services and programs for university and community life.

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 Caron 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 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.

The Master's Degree

Two programs of study lead to the M.A. degree in history: the thesis and non-thesis option. 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 chairperson, 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 in thesis research. A candidate in the non-thesis program should, with the approval of the chairperson, 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 in thesis research. A candidate must submit an acceptable thesis and pass a comprehensive oral examination covering the selected concentration and the thesis.

A candidate in the non-thesis program must complete two research papers and receive an *A* or *B* for the papers. These papers are normally done in the 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 of the candidate's choice from the following list.

United States to 1877	Europe, Mediaeval
United States, 1865 to present	England since 1600
Latin America, Colonial	Europe, 1450-1789
Latin America, 19th Century	Europe, 1789 to present
Latin America, 20th Century	Asian History
Europe, Ancient	

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 in secondary education or in 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 appropriate adviser in the administering department in the College of Education before registering for courses.

For the Master of Arts degree major in history, 30 semester hours of satisfactory graduate work are required; at least 15 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. student must take at least two research seminars in history.

A candidate for the Master of Arts degree must satisfy the research requirement by demonstrating proficiency in a foreign language or in quantitative methods (statistics, computer programming, or data management).

The language requirement 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 arrangements made between the graduate adviser and the student's adviser.

Graduate students may demonstrate proficiency in quantitative methods by passing, with a grade of *A* or *B*, two courses from among the following: Computer Science 202; Educational Psychology 506 and 507; Political Science 503; Math 514, 515, and 516A and B. The courses selected will be determined in consultation between the student, the student's adviser, and the graduate adviser. With the consent of the graduate adviser and student's 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 candidate must fulfill the research tool requirement for either the thesis or the non-thesis program.

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 except that they will include successful completion of four seminars with grades *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. Examinations will cover four fields and the student can be certified as proficient in the fifth field. Full-time Ph.D. degree students who have not passed their preliminary examinations must take, in each semester, at least six 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 quantitative 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 chairperson, 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, communi-

cation 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 intended that the student's entire graduate program be a challenging, stimulating, and valuable educational experience. For this reason, the School of Journalism has three 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 the 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 two academic terms 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 three 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 Southern Illinois University at Carbondale.

Master of Arts Degree

The Master of Arts degree student usually builds on a base of social science and

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 in the mass media.

The Master of Science degree work consists of two 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 six 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 six hours of written master's comprehensive examinations and a two-hour oral.

Doctor of Philosophy Degree

The Ph.D. 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, three 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 (Journalism 500 and 504). In addition, programs of study will include two appropriate research tools, as described below. All doctoral students must complete a graduate course in media law and a graduate inferential statistics course (Guidance 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 two useful tools from among:

Research Design—Journalism 501

Historiography—Journalism 530

Legal Research—Journalism 540

Statistics—Guidance 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 Journalism 600. Each student must enroll in Journalism 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 Journalism 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 in 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 two M.A. degree programs: the M.A. degree in English as a foreign language and the recently expanded 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 acquisition.

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 the traditional program in theoretical linguistics as well as an applied linguistics focus, and they replace the department's earlier program in theoretical linguistics. 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 constitute a minor or a selection of electives in related degree programs, such as communication disorders and sciences, psychology, English, foreign languages, speech communication, and anthropology. Both 400- and 500-level courses are offered for a minor in applied linguistics, and in English as a foreign language. Applicants for admission should send inquiries to the chairperson, Department of Linguistics, Southern Illinois University at Carbondale, Carbondale, IL 62901.

Admissions

Applicants for admission to either degree program, besides meeting the general conditions for admission to the Graduate School, are expected to have an undergraduate GPA 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 coursework taken in their program; failure to do so will result in the student 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 department diagnostic examination administered in the first week of the fall term. Students not able to pass the test will be required to take Linguistics 436 (traditional English grammar) and pass the course with a grade of *B* or better. The course yields three credit hours and may 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 department diagnostic examination 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 coursework 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 two terms on academic probation, they fail to return to good standing, they will be dropped from the program.

When students accumulate three or more incompletes, they will be put on academic probation and will return to good standing by reducing the number of incompletes to two or less. While on academic probation the student is subject to the above stipulations for financial assistance and for being dropped from the program.

Comprehensive Examination

Toward the end of their coursework, 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. Student 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.

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 Southern Illinois University at Carbondale is uniquely different from many such programs in the way it blends theory and practical matters; it prepares the students intellectually as well as experientially, so that the student 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 are based upon the application of theoretical linguistics to EFL pedagogy. 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 Linguistics 581 (practicum in EFL/ESL: oral English) and Linguistics 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 Linguistics 100 (oral English), Linguistics 101, 102, 103, 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 (19 semester hours)

- Eng. 401-4 General Linguistics
- Eng. 402a-3 Articulatory Phonetics
- Eng. 430-3 Grammatical Structures
- Eng. 570-4 Theory and Methods of EFL/ESL
- Eng. 581-2 Practicum in EFL/ESL: Oral English
- Eng. 585-3 Practicum in EFL/ESL: Written English

The remaining 13 semester hours in the M.A. degree in EFL program are to be selected from two 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 one semester of study of a modern language (including exotic language) within the preceding five 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. Foreign students, 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 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 one of five concentrations chosen by the student: TEFL/TESL, phonology, syntax/semantics, psycholinguistics, or linguistic variation. A minimum of 40 credit hours is required for the applied linguistics concentration; at least 15 of these must be at the 500-level.

Core Requirements (28 credit hours).

Ling. 401-4 General Linguistics

Ling. 402a-3 Phonetics

Ling. 406-3 Introduction to Historical Linguistics (optional for TEFL/TESL concentration)

Ling. 430-3 Grammatical Structures

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 Syllabuses, 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, Psycholinguistic Seminar, Language and Cognition, Developmental Psychology.

LANGUAGE 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, education, English, foreign languages and literatures, speech communication, philosophy, and 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 coursework 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 the degree program. The student, in consultation with a graduate adviser, shall propose a topic and a chairperson and two 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 chairperson 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 two

copies required by the Graduate School and requested by committee members, the student must submit a copy of the thesis to the department.

Candidates for the 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 three academic years of coursework. Such proficiency is demonstrated by obtaining at least a grade of *B* in the appropriate Foreign Languages 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.

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. A program may be developed for a teaching specialty in mathematics in the Master of Science in Education degree in curriculum and instruction or in higher education. 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 of which at least 15 must be at the 500 level and at least 21 must be in courses offered by the Department of Mathematics. A minor concentration may be taken outside the department if approved by the graduate adviser.
2. The candidate's program must include at least one 400- or 500-level course from each of four 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 attend at least 10 departmental colloquia.
4. The candidate must prepare a research paper (3 hours credit in Mathematics 595) 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. This examination will be given by the three members of the student's committee and chaired by the research adviser.

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 of the 500 level, at least 21 must be in courses offered by the Department of Mathematics, and at least 6 in an approved minor area outside the department.
2. The candidate's program must include:
 - a. In mathematics: 452 or 501, and at least one course in applied analysis.
 - b. In statistical theory: 480 or 483, and 580.
 - c. In statistical methods: 484 and at least one of the courses 473, 487, 489, or 584. 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 a proficiency in computer programming. This requirement may be met by passing with a grade of *B* or better CS 202 and either CS 204 or CS 314f.
4. The candidate must attend at least 10 departmental colloquia.
5. The candidate must prepare a research paper (3 hours credit in Mathematics 595) 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.
6. The candidate must demonstrate satisfactory performance on a final oral examination covering the graduate course work and the research paper. This examination will be given by the three members of the student'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 Mathematics 419, 421, 433, 452, and at least three of the courses Mathematics 501, 520, 550, 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, New Jersey, or by passing an examination given by the foreign language examining committee of the Department of Mathematics.
4. The candidate must attend at least 10 departmental colloquia.
5. The candidate must prepare a thesis (3 hours credit in Mathematics 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.
6. 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 student's committee and chaired by the thesis adviser.

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.

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 three areas each of which is commensurate with a 500-level graduate course at SIUC. After consultation with the graduate adviser candidates will choose the three areas over which they are to be examined, with two of three chosen from Mathematics 501, 520, 530, 555, 580. The third area normally corresponds to another 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.

Two faculty members appointed by the graduate adviser will prepare, administer, and grade the two-hour written examination over a given area. The graduate adviser together with the six examiners will discuss the candidates' performance and vote on whether they have passed the qualifying examination as a whole with five favorable votes being necessary for the successful completion of this requirement. Candidates who fail the qualifying examination will be expected to take all three parts again at a later date provided the time limit has not been exceeded. Candidates who fail to pass 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, New Jersey, or by passing an examination given by the foreign language examining committee of the Department of Mathematics. 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 CS 314f.
3. The candidate must complete a major (12 hours) and two minors (6 hours each) 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 five members with the dissertation adviser as chairperson. 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 chairman, 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 qualify-

ing 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 chairman) question the candidate. The candidate will pass the preliminary examination provided that four members of the committee including the chairman 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.

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 chairman so agree in which case the dissertation committee will be reconstituted in an appropriate manner. The revised committee may then prescribe additional coursework and require the candidate to re-take 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 attend at least 20 departmental colloquia.
8. The candidate must complete a dissertation (representing at least 24 hours in Mathematics 600) under the supervision of the dissertation adviser. The dissertation adviser and the other four 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 questions. The dissertation will be accepted provided the dissertation adviser and three other members of the committee so agree.

Practicum. Every graduate student in mathematics is expected to develop the ability to communicate mathematical concepts orally in a professional environment. In keeping with this requirement, the graduate adviser will assign to each graduate student a suitable professional duty (e.g., participation in a research seminar, teaching an undergraduate class under faculty supervision, conducting help sessions for undergraduate students, serving as a team member on a research project) each semester of enrollment in one of the four graduate degree programs offered by the department.

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 two separate application forms, one for the Graduate School and the other for the Department of Microbiology.

Graduate Record Examination (GRE) scores and three 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 Microbiology 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 chairperson 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 attesting to the student's outstanding ability and potential to perform doctoral research.

Upon approval of the student's eligibility by the department, the chairman 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 nine semester hours of credit selected from departmental courses numbered 504, 520, 542, 543, 551, 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 Microbiology 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 chairperson at least six weeks before commencement. The approved thesis, in final form, must be submitted to the dean of the Graduate School at least three 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 chairperson.

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 (Chemistry 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 three of the following: 520, 542, 543, 551, 553, and 562 or two 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 chairperson. 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 Microbiology 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 (five 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 fourteen 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 four of the five 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 *two 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 (Coal Extraction and Utilization) Engineering

Department of Mining Engineering

The mining engineering department at SIUC is a young and growing department in the College of Engineering and Technology. The department presently offers a four-year Bachelor of Science degree major in mining engineering and a graduate program leading to a Master of Science degree (coal extraction and utilization) major in mining engineering. It also participates in a college-wide program in the Doctor of Philosophy degree in engineering science. The current enrollments in the undergraduate and graduate programs are 30 and 22, with increases in undergraduate enrollment expected to level off at about 120-150 students.

Current research in the department emphasizes four areas: rock mechanics and strata control, mine planning and design in surface and underground coal mines, mine reclamation, and coal preparation. Ongoing and completed projects in these areas include mine subsidence in room-and-pillar mining, pre-mining investigations to delineate ground instability problems in advance of mining, effects of moisture absorption and swelling on strata stability in coal mines, the effect of moisture on anchorage capacity of roof bolts, development of pin-set bolting concept, remote control of backfilling in abandoned room-and-pillar mines, industrial engineering studies of mined land reclamation, integrated mining and reclamation concepts, production potential of novel underground mining systems, model studies of air flow in multiple entries, removal of pyritic sulfur from coal using flotation, and recovery of coal from refuse and slurry ponds.

The department is equipped with modern laboratories in the areas of rock mechanics, coal preparation, and mine ventilation and provides excellent opportunities for research. The University Coal Extraction and Utilization Research Center is located on campus and assists researchers in developing research funding sources. Excellent opportunities exist for graduate students to work at the center during summers.

A graduate program leading to a Master of Science degree major in mining (coal extraction and utilization) engineering is available in the Department of Mining Engineering Technology for students who are interested in coal extrac-

tion and utilization. The program is administered academically by a program committee. Course offerings and research activities include:

Coal Extraction—mine ventilation and environment control, mine extraction systems, strata control and rock mechanics, mine management, design of mine machinery

Coal Utilization—coal preparation processes, coal conversion and combustion processes

Environmental Effects—mine-waste management, emission control engineering, waste-heat management, mining and the environment

Basic Science Related to Coal Mining—coal geology, hydrology, coal chemistry

Admission

Students seeking admission to the graduate program in mining engineering must meet the admission standards set by the Graduate School. In addition, a bachelor's degree major in engineering or its equivalent is required for admission into the program. A student whose undergraduate training is deficient may be required by the program committee to make up coursework without graduate credit.

Requirements

A graduate student in mining engineering is required to develop a program of study with a graduate adviser and establish a graduate committee of at least three members at the earliest possible date. The graduate committee must be approved by the mining engineering program committee. 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 major. 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 in the mining engineering major including no more than three semester hours of the appropriate Mining Engineering 592 course to be devoted to the preparation of a research paper. In addition, each candidate is required to pass a written comprehensive examination. The graduate committee of a student who is in the non-thesis option will:

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

Assistantships and fellowships are available for qualified applicants. Additional information about programs, courses, assistantships, and fellowships may be obtained from 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 three 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 include the three 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. 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 three years; however, four 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 Physics 205C-3).

Physics—two semesters of sophomore level physics and either the third semester of university physics or physical chemistry (Physics 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 Botany 335, Chemistry 352, Microbiology 301, Microbiology 302, Psychology 312, and Zoology 309 or three courses from Biological Sciences 305, 306, 307, 308, 309, and Physiology 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 chairman 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 three 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 three breadth areas from the following list of eight broad preliminary examination areas. Each of these breadth areas is described by graduate courses. The student may pass each breadth area in two ways: (1) by passing two 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 chairman of the molecular science program will appoint faculty member 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 three 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 two 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. 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 chairman will serve as graduate adviser for the program. Each student is expected to consult the chairman in planning the initial part of the graduate program 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 three semesters after being admitted to the program. The dissertation adviser will recommend a Ph.D. committee which the program chairman 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 Music 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 Music 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 Music 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 Music 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; 403a, b 404, 409, 412a, b 413a, b, 415a, b, 417a, b, 432, 505, 513 (2,2), 517a, b, 530, or 522.

PIANO EDUCATION ARTS CONCENTRATION

Majors complete hours of credit in the following music courses: 3 credits in 501; 2 credits in 502a or b; 4 in 440 or 540; 4 credits in 498 and 2 credits in 595 or 4 (2,2) in 498 and 2 in 595 or 2 in 498 and 4 in 599; 2 in 483 (readings in piano pedagogy); 2 in 499 (graduate teaching practicum); 2 credits (1,1) from 566; 3 from approved

music electives; and 6 hours from approved non-music courses (in fields of guidance and educational psychology, higher education, philosophy, and speech communication).

MUSIC EDUCATION CONCENTRATION

Majors complete Music 501-3; 502a or b (2); 4-5 credits from 509, 578 or 503; 7-8 credits selected from music education courses; 2 credits (1,1) from 566; 5 credits elected from non-music education courses including at least one course from 410, 482, or the 470 or 570 series; 599-6 or six 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 than 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 three 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 student's 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 six 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 five weeks before the intended date of graduation, carrying the approval of all members of the student's graduation committee. The graduate coordinator will forward one copy of a student's document (two, if a thesis) to the Graduate School and retain one copy.

Occupational Education

(See Vocational Education Studies for program description.)

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.

Associated with the department are the Center for Dewey Studies, which is preparing and publishing the definitive edition of the collected works of John Dewey, and The Library of Living Philosophers, edited by Lewis E. Hahn. The University library provides excellent research facilities with 1.8 million volumes, an extensive collection of philosophical journals, and important archives in American philosophy, including the Open Court papers, and the papers of John Dewey, J. H. Tufts, Stephen C. Pepper, Edward Scribner Ames, Henry N. Wieman, and Herbert Schneider. These resources contribute to an important emphasis on American philosophy in our program. In cooperation with the Department of Philosophical Studies of Southern Illinois University at Edwardsville, a programmatic emphasis on philosophy for children in our Ph.D. program provides an opportunity for combining work on the philosophical concepts involved in teaching philosophy to children with the traditional academic program.

An important part of the graduate program is a philosophy colloquium in which faculty and students participate. Distinguished visiting philosophers from this country and abroad present lectures to this colloquium throughout the academic year. The graduate students have their own philosophy club which meets for papers and discussion on alternate weeks. They also edit and publish *Kinesis*, a graduate journal in philosophy.

The Department of Philosophy offers graduate work leading to the Master of Arts and Doctor of Philosophy degrees. Graduate courses in philosophy may be used also 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 Graduate School.
2. Two official transcripts of each school attended to be sent to the Graduate School. One transcript should 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. Scores for the Graduate Record Examination verbal and quantitative scores are requested but not required to be submitted to the department.

The department expects an applicant for admission to its graduate program to have had at least 15 semester hours work 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. The applicant will be required to make up serious background deficiencies by taking appropriate undergraduate philosophy courses without credit.

Applications for University fellowships and Morris Fellowships should be sent 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.

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 within a pre-doctoral program and those who plan to receive a terminal master's degree. For the latter students the department offers increased opportunities for electives in the field of education or in subjects related to philosophy.

Pre-Doctoral Program. In order to receive an M.A. degree within a program leading to the Ph.D. 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.
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.

Teaching Master's Program. In order to receive an M.A. degree within a program designed to prepare students for two-year college teaching the student must:

1. Complete 30 semester hours of course work, 9 of which may be taken outside the field of philosophy in either the Department of Higher Education or in fields related to philosophy approved by the department's director of graduate studies.
2. Demonstrate competence in formal logic as in 2 above.
3. Pass the department's M.A. comprehensive examination on the history of philosophy as in 3 above.
4. Fulfill the department's research writing requirement described in 5 above.

Students within this program are not required to demonstrate reading knowledge of a foreign language.

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. To enter the doctoral program leading to this degree the student must have received an M.A. degree in philosophy at either Southern Illinois University at Carbondale or some other institution.

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. These courses do not 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 work beyond the M.A. degree and has been admitted to candidacy for the Ph.D. degree. After the dissertation has been accepted by the candidate's committee, the student is given an oral examination on the dissertation and related topics. Should a student fail to complete the dissertation within five years after admittance to candidacy, the student must 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.

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 chairperson 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 Physics 500 (or mathematics equivalent), Physics 510, Physics 520, and Physics 530A. 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 Foreign Language 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 Physics 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 Foreign Language 488 with a grade of *A* or *B*, for the language option, or by passing Mathematics 475a, Computer Science 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 six nor less than three 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 candidate for an M.S. degree is required to earn one credit in Physics 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 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 botany, 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 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 botany. The program, which is administered by the Graduate School through the Department of Botany, 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 chairperson 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 chairperson 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) comple-

tion 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 chairperson 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 sixty 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 Political Science 500. Proficiency in one research tool complementing the selected areas of emphasis is also required, i.e. statistics, computer science 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 six 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, (2) 15 credit hours of elective coursework, (3) a research report, for which 6 credit hours are awarded, (4) an oral examination, and (5) an internship, for which 6 credit hours are earned. 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 enrollment in certain core courses and may be demonstrated by completion of an appropriate graduate level course, or, on occasion, by previous undergraduate coursework.

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 a 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 coursework and the research report, an oral examination is scheduled and conducted by the student's faculty committee. The examination gives attention to coursework 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 provides a stipend as negotiated by representatives of the program and agency. The internship is normally scheduled to begin after coursework 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 paper as specified in program guidelines.

The student may substitute 6 semester hours of coursework for the internship if a request is approved by the program director or if an appropriate internship is not available.

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 coursework outside the prescribed law curriculum during the first year of law classwork. Students may enroll for both law and graduate coursework during subsequent years provided a minimum of ten semester hours of law and twelve 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.

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 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 (see below).

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 must take four written examinations with an oral examination to follow. 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 have completed the pro-seminar and a minimum of three additional hours in each area offered for preliminary examinations. In addition, the student, before enrolling in Political Science 590 Readings or Political Science 591 Individual Research, must have completed the appropriate pro-seminar for the area in which readings or individual research is to be done. Readings or individual research may represent no more than three hours of the six hours required as a minimum in each area of examination. The student must also complete the requirements for two research tools (see below) and the two Political Science 501 research methods courses best complementing the student's areas of study. Students may propose substitutes to the graduate studies committee for approval. The student's advisory committee may require additional course work, in or out of the areas of examination. At least half of all course work must be in 500-level courses.

Accelerated Entry into Ph.D. Program. A student enrolled in the M.A. 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. 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. 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. in accordance with the established rules of the department and Graduate School.

Direct Entry into the Ph.D. Program. Students admitted under the direct entry option are required to fulfill M.A. degree method, tool, and coursework requirements as part of the Ph.D. Additional measures of progress may be required by the student's advisory committee.

Preliminary Examinations. Before preliminary examinations can be scheduled the student must have successfully completed two of the Political Science 501 courses, all coursework, and two research tools, have an overall GPA in Ph.D. work of at least 3.5 and have had an appropriate 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 four 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.; 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 graduate studies committee.

Research Tools. All Ph.D. degree students must satisfy a statistics tool requirement by successfully completing both Mathematics 516a and 516b, an interdisciplinary sequence taught by mathematicians, political scientists, and sociologists. Any exception to this statistics tool requirement must be approved by the graduate studies committee, e.g., a student with adequate course work in calculus might propose Mathematics 483 and 487 or 488. The second required tool may be satisfied by selecting either a foreign language, computer science, or a tool designed specifically for the student's research interest and approved by the student's advisory committee and the graduate studies committee. A tool field may be offered as a preliminary examination area only if (1) it does not include the course work used to fulfill the tool requirement; (2) it is of a more advanced level of expertise than that assumed for the tool requirement (at least one more year of advanced coursework;) and (3) it is approved by the student's advisory committee.

Passing the Educational Testing Service foreign language examination with a minimum score of 465 may be used to fulfill the requirement in the common languages (Spanish, German, French, or Russian). A special examination locally administered is used for the uncommon languages, such as Arabic, Chinese, or Vietnamese.

Alternatively, the language requirement may be satisfied through the successful completion of 388 and 488 in the Department of Foreign Languages and Literatures. Where the Department of Foreign Languages and Literatures recommends that the student start with 488, the successful completion of the recommended course will satisfy the requirement. Students whose native language is not English may offer English to satisfy one tool requirement.

The student may choose one of three options for demonstrating proficiency in computer science.

1. Computer Science 202 or 212 and either Computer Science 204, or an appropriate upper-level course, e.g. 302, 314f, 314l, or 470.
2. Computer Science 202 or 212 and Political Science 503.
3. Computer Science 202 or 212 and the successful completion of a programming problem assigned by the Department of Political Science faculty.

Research tool courses taken at other institutions may be submitted to the director of graduate studies for consideration as courses equivalent to those specified above.

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.

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 5 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 10 days before the scheduled oral examina-

tion. 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 Southern Illinois University at Carbondale 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 coursework, 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 evaluation 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 hour credit for coursework, research projects, and internships completed under SSU faculty direction towards the SIUC political science Ph.D. degree. Other coursework, 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, Southern Illinois University at Carbondale.

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 5 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 in the concentrations, and 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 application forms may be obtained from the Graduate School office, 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.

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. Psychology 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 574, 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: 435, 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 a assessment practicum and an additional semester of therapy practicum plus 5 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, 534, 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 5 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: 523, 530a, 536, 538, 547, 548, 585, and 594f.

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 chairperson.

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.

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. 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 academic 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 chairperson. After preliminary discussion of a topic area with the proposed committee chairperson 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 chairperson.

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 chairperson, the student should arrange a meeting with the chairperson well in advance of the prospectus meeting.

A master's thesis committee consists of three members including the chairperson 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 chairperson. 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 chairperson 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 chairperson to the department chairperson for filing in the student's permanent records. If major modifications are needed, the student may

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 or 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 chairperson, 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 chairperson 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 at the beginning of the spring semester (first year), and students on probation are evaluated at the end of their probation. The evaluation is based on the following criteria: (1) academic performance on a ten point rating scale ($A + = 10$); (2) rating on the training assignment; and (3) progress toward the degree. The student's evaluation may also be based upon evidence relating to professional attitudes and 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 chairperson 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, an AAHPER. The first concentration, administration of recreation and park systems, focuses on skills necessary in the management of local, state, and national recreation program service organizations. The second concentration, recreation resources administration, focuses on skills necessary to provide and maintain lands and facilities in the local, state, and national park system. 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 admission to the program 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 some time 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 520-3 Park and Recreation Management
 Rec 530-3 Programs in Parks and Recreation
 Rec 425-3 Planning Park and Recreation Areas
 Rec 570-3 Seminar in Recreation Management

Guid 506-4 Inferential Statistics

Research Methodology Core (select one)

Rec 550-3 Research in Recreation

EdL 500-3 Education in Research Methods

Research Core

Rec 599-3 Thesis

Total core hours: 28

Lecture hours: 11

Total hours required: 36

RECREATION RESOURCE ADMINISTRATION CONCENTRATION

Theory Core

Rec 500-3 Principles of Recreation
 Rec 520-3 Park and Recreation Management
 Rec 425-3 Planning Park and Recreation Areas
 Rec 445-3 Outdoor Recreation Management
 Rec 570-3 Seminar in Recreation Management

Guid 506-4 Inferential Statistics

Research Methodology Core (select one)

Rec 550-3 Research in Recreation

EdL 500-3 Education in Research Methods

Research Core

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 401-3 Fundamentals of Environmental Education

Rec 423-3 Environmental Education

Total core hours: 28

Lecture hours: 11

Total hours required: 36

THERAPEUTIC RECREATION CONCENTRATION

Theory Core

Rec 500-3 Principles of Recreation
 Rec 520-3 Park and Recreation Management
 Rec 524-3 Professional Skills in Therapeutic Recreation

Rec 526-3 Professional Issues in Therapeutic Recreation
 Guid 506-4 Inferential Statistics
 Research Methodology Core (select one)
 Rec 550-3 Research in Recreation
 EdL 500-3 Education in Research Methods
 Rehab 593-3 Research in Rehabilitation

Research Core

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: 22

Elective hours: 14

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

While a master's degree with a major in rehabilitation administration and services requires a minimum of 30 semester hours of course work and field experience, behavior analysis and therapy and rehabilitation counseling are 4 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

n fulfilling the 45 semester hour requirement, the student must complete the required courses and at least 18 semester hours of didactic coursework 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

12-3 Legal and Ethical Issues in Behavior Analysis

89-1 Professional Seminar in Behavior Analysis and Therapy, taken first fall and spring

94b-3 Practicum in Behavior Analysis and Therapy

95-8 to 12 Internship in Rehabilitation

99 or 593-3 to 6 Thesis or Research Paper

LECTIVE 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

94b-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 rehab 599. The thesis will be reviewed both prior to its initiation (as a prospectus) by a 2-member committee, and following its completion (in an oral defense) by a 3-member committee made up of a chairperson 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 3-6 hours of Rehab 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

The rehabilitation administration and services program is designed to train students to serve as administrators, coordinators, vocational evaluators,

adjustment specialists, placement specialists, and programmers in a wide variety of rehabilitation settings. Its major goal is to develop graduates who are practical, competent rehabilitation professionals through its performance-based curriculum.

Students receive their degree in rehabilitation administration and services but may elect to pursue an administrative emphasis or a vocational (services emphasis or both (double concentration). Students with less than 3 years of rehabilitation or related work experience are generally encouraged to pursue services emphasis or double concentration. All students must complete a minimum of 30 semester hours of graduate course work in addition to completing a full-time internship and a research paper or project. During the first semester of full-time study or a comparable time 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 must include core requirements, professional course sequences, and electives. Specific requirements are as follows:

Core Requirements

Required of all students

Rehb 400-3 Introduction to Rehabilitation

Rehb 513-3 Medical and Psycho-social Aspects of Disability

Rehb 593-3 to 6 Research in Rehabilitation

Rehb 594-3 to 6 Practicum in Rehabilitation

Rehb 595-1 to 12 Internship in Rehabilitation*

Student Choice-2 to 4 One course dealing with either the specialized setting or population with which the student plans to work.

A Research Paper or Project

Professional Course Sequences

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 contain a minimum of four courses from one of the professional course sequences below.

REHABILITATION ADMINISTRATION SEQUENCE

Rehb 570-3 Rehabilitation Administration

Rehb 573-2 to 3 Programming, Budgeting, and Community Resources

Rehb 576-2 to 3 Development and Supervision of Rehabilitation Employees

Rehb 579-3 Advanced Fiscal Management in Rehabilitation

Rehab 479-3 Technical Writing in Rehabilitation

Rehb 582-1 to 4 Seminar in Rehabilitation Services

VOCATIONAL EVALUATION SEQUENCE

Rehb 436-3 to 4 Vocational Evaluation and Adjustment Services

Rehb 431-3 Assessment Procedures in Rehabilitation

Rehb 531-3 Individual Assessment Procedures in Rehabilitation

Rehb 533-2 Vocational Appraisal

Rehb 421-3 Vocational Development and Placement

Rehb 479-3 Technical Writing in Rehabilitation

Rehb 501-3 Rehabilitation Foundations

ADJUSTMENT SERVICES SEQUENCE

Rehb 436-3 to 4 Vocational Evaluation and Adjustment Services

*Credit earned in Rehb 595 does not count as a part of the 30-semester hour minimum (A full time internship consists of a minimum of 480 consecutive clock hours. However, the minimum clock hours for 12 semester credit hours is 540.)

Rehb 406-3 Introduction to Behavior Analysis and Therapy
Rehb 553-3 Learning Therapies for Special Populations
Rehb 421-3 Vocational Development and Placement
Rehb 523-3 Job Restructuring for the Handicapped
Rehb 451-4 General Rehabilitation Counseling
Rehb 501-3 Rehabilitation Foundations

JOB DEVELOPMENT AND PLACEMENT

Required courses in addition to core requirements for this approved concentration:

Rehb 425-3 Developing Employment Opportunities

Two courses from either group A or group B below depending upon student's background:

Group A: Rehb 421, 523, 576, 533, 525, 586

Group B: Fin 476, Econ 436, Econ 532, POLS 428, Psych 576, Mktg 493, Mktg 438

Electives

The students are expected to complete their plans of study with courses relevant to the declared professional course sequence.

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 in turn, substitute 3 semester credit hours of practicum and one additional three semester-hour graduate course or substitute 6 semester credit hours of practicum. These hours are in addition to the required minimum of 30 semester hours of graduate course work.

Option Two. Students with extensive previous work experience in the field of rehabilitation may request waivers of both the practicum and internship requirements. Students currently employed may enroll in Rehb 494, Work Experiences in Rehabilitation, for up to 6 semester hours of credit. The granting of credit for previous experience is not permitted. Students granted a waiver of the practicum and internship requirements must still complete at least 30 semester hours of graduate course work.

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 5 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 chairperson 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 chairperson, 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 chairperson 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 Rehabilitation 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 16 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 *588-4 Seminar in Research in Rehabilitation

REHB *596-4 Research Design in Rehabilitation

SEMINARS ON PROFESSIONAL ISSUES AND METHODS IN REHABILITATION (MINIMUM 18 HOURS)

REHB 578-3 Program Evaluation in Rehabilitation

REHB 580-3 Professional and Community Relations in Rehabilitation

REHB *581-3 Legal and Ethical Issues

REHB 582-3 Seminar in Rehabilitation Services

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.

Coursework 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. Candidacy status for accreditation review by the Council of Social Work Education was granted July 25, 1985.

Master of Social Work

The Master of Social Work degree program has as its basic objective the preparation of social workers who will be capable of delivering social services to meet the human service needs within the state of Illinois, especially the southernmost portion, the midwestern region of the United States, the nation, and as appropriate, on the international level. Within this over-arching purpose, the primary goal of the MSW program is the educational preparation of graduate level professionals with advanced analytic and practice skills capable ultimately of engaging in autonomous social work practice. Graduates with such advanced 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 take foundation curriculum. The second year of study provides an opportunity for focused learning at an advanced level in one of several areas of social work practice. The foundation core curriculum consists of 28 credit hours and includes the following courses.

FALL (13 CREDIT HOURS)

SW 500-3 Human Behavior and the Social Environment I
SW 505-3 Foundations of Social Work and Service
SW 510-3 Social Work Practice I
SW 541-4 Social Work Practicum I

SPRING (15 CREDIT HOURS)

SW 501-3 Human Behavior and the Social Environment II
SW 506-2 Social Welfare Policy Analysis and Design
SW 511-3 Social Work Research
SW 520-3 Social Work Practice II
SW 542-4 Social Work Practicum II

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 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 MSW program.

The Master of Social Work degree program offers three options to applicants who have been accepted by the SIUC Graduate School and the School of Social Work. They are:

PLAN A: BASIC FULL-TIME TWO-YEAR PROGRAM

For full-time students, without an undergraduate degree in social work, who may complete the program in four semesters. Entry is in the fall semester only.

PLAN B: ADVANCED STANDING FULL-TIME PROGRAM

For those students with a baccalaureate degree in social work, who may earn the MSW degree in a summer and two semesters. Entry is in the summer term.

PLAN C: BASIC AND ADVANCED STANDING FULL-TIME REDUCED LOAD PROGRAM

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. The plan requires a minimum of two consecutive semesters, or full-time residency as defined by the University (e.g., fall-spring, spring-summer, or summer-fall). Entry is in the fall semester for students without the B.S. degree in social work and in the summer for students with B.S. degree in social work.

Request to change from full-time to full-time reduced status requires prior approval of the director.

Admissions Requirements

Applicants may be considered for the regular two-year program if they hold a B.S. degree in social work from an accredited college or university with an overall graduate point average of at least 3.0 in the last two years of academic coursework, excluding field practicum and experiential classes. In addition it is expected that applicants will have a broad liberal arts base with a substantial preparation in the social and behavioral sciences and in the humanities.

Applicants who wish to be considered for advanced standing must meet all the criteria noted above, with the addition of a bachelor's degree in social work from an accredited program or School of Social Work.

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.

Graduate Record Examination (GRE) scores are required. 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.

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 1st for both summer term (advanced standing admission) and fall (regular admission) semester.

Applicants must apply to both the Graduate School and the School of Social Work.

Degree Requirements

Students may be admitted to the Master of Social Work degree program as either basic two-year students or as students with advanced standing.

Students admitted to the basic 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.

Students with a Bachelor of Science in social work degree from an accredited social work program may be admitted with advanced standing. These students are not required to complete the first year foundation curriculum. They are required to complete a minimum of 32 semester hours of the second year advanced graduate course curriculum, beyond the 12 credit hours of prerequisite transition course work.

Within limits imposed by the policies of the Graduate School of the Univer-

city, transfer credits will be permitted for up to fifteen semester hours for applicants who wish to transfer from another graduate program in social work.

Candidates must maintain a 3.00 on a 4.00 scale. They must also successfully complete either a thesis or a substantive research project and demonstrate through oral examination the interrelatedness of their product to social work practice and to social policy issues in the field of social welfare.

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 of Southern Illinois University at Carbondale, Carbondale, Illinois 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 solid general knowledge in sociology through lecture 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, social deviance and control, family, social stratification, and social change.

The department ordinarily requires an undergraduate studies GPA of at least 3.0 for admission to the master's program and a graduate studies GPA of at least 3.5 for admission to the Ph.D. degree program. Transcripts of college and university studies and letters of reference are also required. Scores from the Graduate Record Exam are not mandatory but are welcome. International students whose native language is not English must submit TOEFL scores. Persons seeking admission to graduate study in sociology or additional information on the department's graduate programs should apply in writing to: Director of Graduate Studies, Department of Sociology, Southern Illinois University at Carbondale, Carbondale, IL 62901.

The department is committed to obtaining financial assistance for graduate students in residence. The type and amount of assistance varies with the student's progress in the program. Entering students may apply for a graduate assistantship. Assistantships, fellowships, and other stipends include tuition waivers. Funding is restricted to four semesters for M.A. degree students and eight semesters for Ph.D. degree students.

The faculty of the Department of Sociology is research-oriented and supports such an orientation on the part of its graduate students. The department maintains a small library of sociological books and periodicals, and it has a computer facility with terminals, printers, and a minicomputer for the use of its students and faculty.

Master of Arts Degree

The Master of Arts degree in Sociology requires a minimum of 32 semester hours of coursework and a master's research paper. The specific course requirements are: SOC 501-Classical Sociological Theory, Math 516a-Statistical Analysis in the Social Sciences, SOC 512-Sociological Research, three research seminars in

sociology, one additional 500-level course in sociology, or Math 516b, four credit hours in SOC 591-Individual Research (in conjunction with the master's research paper).

The master's research paper is to be developed out of a seminar paper produced in a 500-level sociology course. The faculty member in charge of the seminar will also serve as the adviser for the master's research paper. Four credit hours in SOC 591 Individual Research can be taken with the faculty member for the completion of the research paper. This course can be taken concurrently with or subsequently to the research seminar. The completed paper will then be submitted for evaluation and approval to a panel of three additional faculty appointed by the director of graduate studies in concurrence with the adviser for the master's paper. Students wishing to do research on a topic not covered under seminar offerings can petition the department's academic affairs committee to an exception to this rule.

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 are met.

A. Minimum GPA of 3.7 during the first year of study.

B. Departmental approval of a research paper completed during the first year of study. The procedure and standards for approval are the same as with the regular master's research paper.

Doctor of Philosophy Degree

Advisement.

The responsibility for initial advisement rests with the departmental director of graduate studies. As soon as a tentative general plan of study has been worked out, the director of graduate studies shall, in consultation with the student, request an appropriate member of the graduate faculty of the department to serve as the student's individual academic adviser.

As soon as possible, the student shall, in consultation with the adviser, prepare a plan of study designating the primary and secondary areas of examination (see below). At this point, the student expresses a preference for a program committee of three or four members representing the chosen area of examination. The committee is formally appointed by the director of graduate studies and entered in the student's records along with the declared primary and secondary areas of examination.

Research Tool Requirement. Students must complete the following courses: Math 516 a and b, SOC 501, SOC 502, SOC 512; or furnish proof of equivalent work at the M.A. level. Beyond these requirements, the student must develop in an individual program of study those research skills needed for dissertation research.

Areas of Examination. All Ph.D. degree students must declare two primary areas of 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 and social control, family, social stratification, and social change.

For their secondary examinations, Ph.D. degree students may select from those areas just listed, or from the following: gender, demography, education, formal organizations, political sociology, social psychology, or quantitative methods.

Other areas of examination may be offered in particular cases as student interests develop and faculty resources permit. Approval of a special area of

examination must be obtained from the academic affairs committee at least one semester before the intended date of examination.

One secondary area may be chosen in any department other than sociology which offers a Ph.D. degree program. 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 academic affairs committee.

Course Work and Reading. Lectures and seminars are offered in the various fields according to the resources of the department. Guided reading and research courses are also offered according to the availability of faculty members.

In addition to formal course work, students are expected to qualify themselves by independent reading in primary and secondary areas of examination. Students shall, with the assistance of the program committee, develop their own list of readings covering chosen areas of examination. The personal reading list shall include the most important works in each of the chosen areas as well as those works pertinent to the anticipated dissertation topic. The final reading list must be approved by the student's program committee.

Comprehensive Examination. To qualify for the status of candidate for the Ph.D. degree, students must pass a written comprehensive examination. This examination will be prepared by a special examination committee consisting of 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 student's areas of examination. The supplementary members of the examination committee are appointed by the director of graduate studies.

The comprehensive examination consists of a six-hour examination in each of the two primary areas of examination and a three-hour exam in each of the two secondary areas. The 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 student and of the chair of the examination committee to ensure that the examinations are properly prepared and scheduled.

Examination reports 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 examinations, and the director of graduate studies notifies the student of the results. A failed examination in a particular area must be retaken on the next scheduled date. If it is failed a second time, the academic affairs committee must be petitioned for the privilege of a second and final retake. The written petition must include the student's own diagnosis of the reasons for the failure, and a detailed plan for remedial work. The recommendation of the academic affairs committee is forwarded to the chair of the department who has the final decision. A student is entitled to a combined total of no more than three retakes.

On successful completion of the comprehensive examination, 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 a central part of the Ph.D. degree program, for which early and continuous preparation is important. The responsibility for advisement of the candidate in relation to the dissertation is borne by the dissertation director, who is selected by the student in consultation with the department chair and approved by the dean of the Graduate School. The candidate, in consultation with the dissertation director, shall prepare a prospectus showing

the purpose and scope of the proposed research, its relation to previous work in the field, its theoretical relevance and significance, the methods and techniques to be used, and a summary of the student's experience and abilities in the use of these techniques. When the candidate is ready to present a prospectus, the dean of the Graduate School shall, on the recommendation of the department chair, approve a dissertation committee with the student's dissertation director serving as chair. The dissertation committee shall consist of five members, one of whom shall be from outside the department. The completed dissertation must be accepted by the dissertation director before being circulated among the dissertation committee members for final evaluation.

Oral Examination. After acceptance of the dissertation by the candidate's dissertation committee, an oral examination will be scheduled and conducted by the committee in open meeting. The examination shall be based primarily on the contents and implications of the dissertation.

Sociology as a Secondary Emphasis. A student enrolled in another graduate program who wishes to declare sociology as a secondary area must submit a written request to the chair of the sociology department's academic affairs committee outlining the following: a tentative plan of course work; a tentative personal reading list; and a tentative overall program indicating the relationship of the student's program in sociology to the total program. The student will be expected to take a comprehensive examination in the area.

Interdisciplinary Program. Students who have been admitted to the doctoral 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 an interdisciplinary Ph.D. degree program only when endorsed by the principal sponsoring department. A student who wishes to apply for an interdisciplinary program in which sociology will be the principal sponsoring department should understand that the program of study must include substantial involvement with courses in sociology and that the department may require the student to meet other requirements similar to those established for the doctoral program of 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, 6 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 6 emphases open to those seeking a master's degree in special edu-

cation: (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 580-3, 517-2, 500-3, 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. SPE 425-3, SOC 564-4, or REC 524-3 can be substituted for SPE 517-2 requirement in the emphases for teachers of the severely behavior disordered and teacher of the secondary aged mildly handicapped.

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 nine 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 CIM 531-3 or CIM 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 chairperson and two additional committee members.

A comprehensive examination over the field of special education is also required and conducted by the student's committee chairperson and two additional committee members.

All full-time graduate students in the department may be required to work a maximum of 5 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 chairperson 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 twenty 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 \$5652 to \$6030 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 to the 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 a core of courses in communication theory and methodology as well as course work in the following areas of human communication: communication education, interpersonal and small group communication, language behavior and intercultural communication, performance studies, organizational communication and public relations, phenomenology and philosophy of communication, political communication, rhetoric and public address, semiology, and (at the doctoral level) theater.

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.

Application for admission to graduate studies in speech communication should be directed to the Graduate School. For admission to the department, GRE Aptitude Test or Miller Analogies Test scores must be submitted before a student enters the program or during a student's first term in residence. 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. The official application forms for the supporting materials requested by the department may be obtained from the chairperson of the graduate committee of the Department of Speech Communication. 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 Speech 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. Because of the research emphasis at the graduate level in the Department of Speech Communication, students may be required to purchase additional textbooks or materials.

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*.

Proficiency Examination. A student who has previously had course work that is required in the "Communication Theory and Methodology" curriculum area may petition the graduate committee of the Department of Speech Communication for a waiver of all or part of the course requirements. When a student submits such a petition, the director of graduate studies will appoint a special committee to administer a written examination and certify the results to the graduate committee of the department.

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 French 488, German 488, Russian 488, or Spanish 488, or (3) achieving a PASS grade in French 410, German 416, Russian 411, or Spanish 412. 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 two, but not more than four, of the curriculum areas. All students selecting theater as a curriculum area must complete three of the curriculum areas. In order to satisfy a given area of study, a student must complete at least 9 semester hours of work in that area, 3 hours of which must be at the 500 level (this requirement is waived in the case where such a 500 level course does not exist). A course used for one curriculum area may not be counted toward another area. All master's students planning to study for a Ph.D. degree should select the communication theory and methodology as one curriculum area.

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 Speech 599 counted toward the 30 hour minimum. In addition, the student must register for at least one semester hour of credit in Speech 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 Speech 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 or written examination over course work taken. 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 Speech 595 counted toward the 30 hours minimum. A research report is submitted as evidence of knowledge of research techniques. 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. A comprehensive written examination is taken over the course work.

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. Students planning to pursue a doctoral degree upon completion of the master's degree are often advised to select Plan 1: Thesis, since some universities view Plan 2: Research Report, as a terminal degree.

Doctor of Philosophy Degree

A minimum of 42 semester credit hours of course work 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. An advisory committee shall be established during the first semester of graduate study to plan the program of study with each student. The committee shall be composed of one faculty member from each curriculum area chosen by the student. The chairperson 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.

Program of Study. The advisory committee and the student will plan the program of study. The program of study must consist of course work in at least two, but not more than four, of the curriculum areas. All students selecting theater as a curriculum area must complete at least three of the curriculum areas, one of which is methodology. In order to satisfy a given area of study, a student must complete at least 12 semester credit hours of course work in that curriculum area, 3 hours of which must be at the 500 level (this requirement is waived in the case where such a 500 level does not exist). A course utilized for one curriculum area may not be counted as part of another area. All students are required to select communication theory and methodology as one curriculum area. The communication theory and methodology area consists of the following requirements:

1. Spch 501-3 Introduction to Speech Communication Research. (Theater students may substitute Thea 500-3 Introduction to Research Methods and Thea 530-1 to 12 Independent Study.)
2. Spch 401-3 Communication Theories and Models, or Spch 510-3 Seminar: Rhetoric and Communication.
3. Three credit hours selected from:
 - Spch 502-3 Seminar: Quantitative Communication Research.
 - Spch 503-3 Seminar: Phenomenological Communication Research.
 - Spch 572-3 Theory and Criticism in Interpretation: Twentieth Century
4. Four semesters of Spch 598 Proseminar in Human Communication. As a non-credit course, a grade of Satisfactory *S* or Unsatisfactory *U* will be assigned on the basis of attendance and participation.
5. Six semester hours at the 400 and/or 500 levels, in or outside the department. These may include courses required as prerequisites to courses in 3 above and/or selection of courses in 2 and 3 above as long as these are not counted as courses meeting other area requirements.

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 degree program. The examination will call for demonstrated theoretical competence in the particular methodology selected by the student as part of

the communication theory and methodology area. In the case of a foreign language, an E.T.S. examination may be substituted for the departmental examination by petition to the graduate committee of the Department of Speech Communication. In the case of a foreign language one of the following may be substituted for the departmental examination by petition to the graduate committee of the Department of Speech Communication: (1) E.T.S. examination, or (2) achieving a grade of *B* or *A* in French 488, German 488, or Russian 488, or Spanish 488, or (3) achieving a *PASS* grade in French 410, German 416, Russian 411, or Spanish 412. Current standards for passing the E.T.S. examination are available from the director of graduate studies.

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 coursework 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 undergraduate 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 580 Telecommunications Technology. Students are also required to complete selected other 500 level courses in their major.

As a part of the 30 hours required to be graduated, 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 to the student upon completion of the research report.

During the first semester of coursework, 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 coursework and prior to work on the thesis.

Retention

A 3.0 grade point average in coursework 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, Illinois 62901 (Tel.: 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 experience 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 51 semester hours course work, including the M.F.A. core requirements:

Theater 400- 2 hours

Theater 500, 501- 5 hours

Basic theater course in area- 3 hours

Total M.F.A. core- 10 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 Theater 417a or 517a)- 10 hours

Area requirements- 31 hours

Four semesters of Graduate voice- 8 hours

Four semesters of Graduate movement- 8 hours

Three semesters of Graduate acting- 9 hours

Theater 599- 6 hours

Electives (Theater 526a suggested)- 10 hours

Total: 51 hours

Acting/Directing.

M.F.A. core (including Theater 402a)- 10 hours

Area requirements- 26 hours

Theater 402b, 502- 6 hours

Theater 503a, b- 4 hours

Theater 513a, b- 4 hours

Theater 517a, b- 6 hours

Theater 599- 6 hours

Electives (by advisement)- 15 hours

Total: 51 hours

Production Design. (separate concentrations in scenic/lighting/costume design and technical direction)

M.F.A. core (including Theater 4071)- 10 hours

Area requirements- 26 hours

Theater 414a, 418- 6 hours

Area theater electives- 14 hours

Theater 599- 6 hours

Electives (by advisement)- 15 hours

Total: 51 hours

Playwriting.

M.F.A. core (including Theater 411a)- 10 hours

Area requirements- 26 hours

Theater 402a or b, or 502- 3 hours

Theater 411b, 511, 526b- 9 hours

Theater 504 or 505- 3 hours

Theater 454 or 550- 2 to 3 hours

Theater 530- 3 to 2 hours

Theater 599- 6 hours

Electives (by advisement)- 15 hours

Total: 51 hours

Thesis requirements vary for each area of study; however, they include

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. 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 the Master of Science in Education degree with majors in business education and occupational education, and cooperates with the Department of Agricultural Education and Mechanization in offering a concentration in agricultural education. The programs are described below.

BUSINESS EDUCATION

Graduate courses in vocational education studies and business education may be taken as a major or minor leading to the Master of Science in Education degree in business education.

Admission to the program must be approved by the faculty of business education, in the Department of Vocational Education Studies, with approval dependent upon the preparation, ability, and promise of the individual student. For the Master of Science in Education degree, there are no formal admission requirements beyond those of the Graduate School.

The graduate program is planned for those students who have an adequate subject-matter background in at least one of the following business teaching areas: (1) secretarial, (2) general business or consumer education, (3) bookkeeping and accounting, (4) marketing/distributive education, or (5) data processing. Deficiencies in background, if any, must be eliminated by taking appropriate courses.

Master's Degree

The program is aimed at upgrading and making more proficient those individuals who have already met or surpassed the minimum requirements for teaching business subjects in the high school, community college, or other type of educational institution offering business education curricula.

The major consists of a minimum of 30 semester hours of course work distributed as follows:

1. Twelve or more hours in vocational education studies and business education courses (including thesis), such as: improvement of instruction in business education, principles and problems of business education, research in vocational education, and organization and administration of vocational business education. The following courses are required: VES 410, VES 510, VES 566. Four-hundred level courses taken for undergraduate credit cannot be taken again for graduate credit.
2. Six or more hours in business or economics courses offered by departments in the College of Business and Administration, or by the Department of Economics, or in the concentration of business education in the Department of Vocational Education Studies.
3. Six or more hours in courses not generally considered to be business education.

Each student's program is tailored to meet the particular needs and interests, within the general requirements of the Graduate School.

In keeping with the general requirements of the Graduate School, each student is required to conduct an investigation and write a thesis or a research report. Those who have special interest and ability in research or who expect to go on to advanced graduate study are encouraged to write a thesis.

The thesis may be counted for not more than six nor less than three semester hours of credit. 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.

The passing of a final written examination is required at the end of the program. The examination is given each semester. Broad, essay-type questions are asked that require the student to apply the knowledge acquired in solving realistic problems. Each student selects four areas to be included in the examination, writing on each area from forty to sixty minutes.

Fellowships and teaching assistantships are available to qualified graduate students. All carry stipends and remission of tuition. Applications for these awards should be submitted by February 1.

Additional information concerning the graduate program in business education may be obtained by writing to the program coordinator of business education in the Department of Vocational Education Studies.

OCCUPATIONAL EDUCATION

Programs leading to the Master of Science in Education degree, with a major in occupational education and to the Doctor of Philosophy degree in education with a concentration in occupational education are offered through the Department of Vocational Education Studies. Each program is individually tailored by the student's advisory committee to meet the student's career objectives.

Students with degrees in education, science, technology, or other specialties may qualify for advanced study which involves technical subjects, study in work situations and educational institutions, and internship in teaching, research, or other professional assignments.

Programs of study are developed by the student and the adviser depending upon interests, and career goals. Programs are flexible, and course work may be done in other units of the University. The student is advised to prepare for one major area of study; no minor is required. Some areas of study are: teacher of industrial oriented health, or personal and public service occupations; industrial arts; coordinator of cooperative occupational education; and supervisor director, or administrator of programs in secondary, area vocational, community junior colleges, industry, or other vocational-technical or occupational systems.

Teaching or research assistantships, and fellowships are available to qualified applicants. Additional information about programs, courses, assistantships, and fellowships may be obtained from the coordinator of graduate studies in occupational education in the Department of Vocational Education Studies.

Doctor of Philosophy Degree in Education

The Department of Vocational Education Studies participates in the doctoral program in education with a concentration in occupation education. See the description of the Ph.D. degree in education.

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 unequalled 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 chairperson.

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 chairperson.

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 Zoology 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-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 Arts 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 Zoology 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 Science 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 Zoology 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 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 Guidance 506 and 507. In computer science a student should take Computer Science 202 and one of the following: 220 or 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 normal 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 Zoology 600, Dissertation Research. The dissertation is evaluated by the student's advisory and research committee, viewed 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.

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 below in order of their appearance on the following pages.

Accountancy	Japanese
Administration of Justice	Russian
Agribusiness Economics	Spanish
Agricultural Education and Mechanization	Forestry
Agriculture	Geography
Animal Industries	Geology
Anthropology	Health Education
Art	Higher Education
Behavior Analysis and Therapy	History
Biological Sciences	Industrial Technology
Botany	Journalism
Business Administration	Linguistics
Accountancy	Mathematics
Finance	Medical Education Preparation
Management	Microbiology
Marketing	Mining Engineering
Business Education	Molecular Science
Biochemistry and Biochemistry	Music
Cinema and Photography	Occupational Education
Communication Disorders and Sciences	Philosophy
Communications and Fine Arts	Physical Education
Community Development	Physics
Computer Science	Physiology
Curriculum, Instruction, and Media	Plant and Soil Science
Economics	Political Science
Education	Psychology
Educational Administration and Higher Education	Radio-Television
Educational Psychology	Recreation
Engineering	Rehabilitation
Civil Engineering and Mechanics	Religious Studies
Electrical Engineering	Science
Mechanical Engineering and Energy Processes	Social Work
Engineering Technology	Sociology
English	Special Education
Foreign Languages and Literatures	Speech Communication
Chinese	Statistics
Classics	Telecommunications
French	Theater
German	Vocational Education Studies
	Zoology

The first entry for each course is a three-digit identification numeral. Course numbered 400-499 are open to both seniors and graduate students, unless designatd 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 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/(Satisfactory/Unsatisfactory) only.

Graduate students at Southern Illinois University at Carbondale are required to purchase textbooks, instructional materials, and supplies needed for each course. Field trips are required for certain courses.

All courses offered in a specific term will be listed in the appropriate Schedule of Classes which is published three times a year. They are available at University Publications, Southern Illinois University at Carbondale, Carbondale, IL 62901.

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: 322 with a grade of C or better.

422-3 Current Developments in Accounting Theory. Critical analysis of current developments in accounting theory, especially as reflected in the publications of major accounting associations. Prerequisite: 322 with a 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: 331 with a grade of C or better.

441-3 Advanced Tax. Study of income tax problems which arise from sole proprietorship, partnership, corporation, estate, and trust types 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: 341 with a 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: 351 with a grade of C or better.

461-3 Advanced Auditing. The study and application of selected auditing concepts and techniques. Hands on applications will be emphasized.

Prerequisite: 361 with a 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 governmental 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 a grade of C or better.

495-1 to 6 Internship. Supervised work experience in professional accounting. Prerequisite: outstanding record in accounting and recommendation of the departmental committee on internship.

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 Controllorship 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 firm. 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.

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. or M.B.A. program or consent of instructor.

590-3 Seminar in Accounting. Discussion of current accounting theories, principles, standards, and problems. Prerequisite: enrollment in M.Acc. or M.B.A. program or consent of instructor.

591-1 to 6 Independent Study. Directed independent study in selected areas of accountancy. Prerequisite: enrollment in M.Acc. or M.B.A. program or consent of instructor.

599-3 to 6 Thesis. Prerequisite: enrollment in M.Acc. or M.B.A. program or consent of instructor.

601-1 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. 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, and the exclusionary rule, civil liberties, eavesdropping, confessions, and related decision-making factors. Prerequisite: 310.

409-3 Constitutional Rights of Criminal Justice Personnel. A review of the historical development of civil rights; due process; equal protection, and cruel and unusual punishment theory. Examines court decisions that shape civil rights and affirmative action, the rights of criminal justice personnel, including unionization, free speech, and freedom from arbitrary dismissal.

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.

416-3 Methods of Criminal Justice Research. The principles of scientific inquiry as applied to the study of the criminal justice system. Overview and examples of project design, evaluative research, methodology, and statistical techniques appropriate to criminal justice research. Strongly recommended for students who plan to conduct empirical research in fulfillment of master's thesis requirement. Prerequisite: 201 and 290 or consent of instructor.

417-3 Research Practicum in the Administration of Justice. Application of the principles set forth in 416. Experience in the various phases of an actual research project, including project design, data collection and analysis, and effective communication of results via written reports. Prerequisite: 201 and 290 and 416 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 exter-

nal 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. 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.

471-3 Principles of Management in the Administration of Justice. Basic principles and techniques of the management in law enforcement, correctional, and other criminal justice agencies. 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 emerged to control it. The problems and promise of juvenile justice in the 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 response 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 to 6 (3 per topic) Selected Topics in Correctional Program Services. (a) Correctional case management. Prepares students to become practitioners, supervisors, and administrators in probation, parole, correctional institutions, and community-based programs in roles traditionally assigned to probation and parole officers, correctional counselors, social workers, and similar titles. Recognizes the importance of the case manager as the planner, mobilizer of resources, advocate, and community organizer. (b) 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: 201 and 290 or consent of instructor.

requisite: 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 semester) 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 or consent of instructor.

500-3 History and Philosophy of Criminal Justice System. Exploration of the origins and significance of key ideas influencing the rise and development of criminology as multidisciplinary theory and practice. Prerequisite: consent of instructor.

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 to 6 (3 per topic) Seminar in Advanced Criminal Justice Research. (a) Design. Advanced treatment of the rationale, underlying assumptions and instrumentation of experimental, quasi-experimental and survey research appropriate to the study of criminal justice. (b) Analysis. Focuses on multivariate analysis, specifically, multiple regression, analysis of variance, and log-linear models. Emphasis will be on the conceptual basis of the models and their application to criminal justice.

562-3 Fundamental Legal Systems in Criminal Justice. Practical use of a law library culminating in two legal research papers. The philosophical and historical evolution of law with emphasis on the development of American legal procedures. Prerequisite: graduate status.

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.

72-4 Seminar in Criminology. (See Sociology 572.)

78-1 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.

80-3 Planning for Change in the Administration of Justice. A simulated planning and design experience with real justice system problems is offered. Each student is required to individually investigate a criminal justice subsystem, study the literature and theoretic

cal foundation on modifying such systems, and develop a comprehensive plan to deal with the assigned system.

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 Seminar in Criminological Program Management. Seminar application of management concepts, including program evaluation, to the practice settings of programs in law enforcement and correctional agencies. Prerequisite: 471 or consent of instructor.

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 9 (3 per topic) Selected Topics in Law Enforcement. (a) Law enforcement education and training; (b) law enforcement policy; (c) law enforcement administration. Provides for analysis of historical, contemporary, and future policies and issues toward preparation for administrative and educational roles in the field. Prerequisite: for (c) 403b.

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.

591-3 to 6 Individual Research. A field project directed by a faculty committee which represents the study of a problem confronted during field experience centering on an applied criminal justice topic and results in a project or program development plan. Graded S/U only. Prerequisite: consent of instructor.

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 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. 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 programs 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 producing goods and services; land markets; public versus private land 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 facts 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 Advanced Farm Planning Techniques. Application of linear programming to

farm planning including enterprise selection, resource allocation, and least cost ration formulation. Farm decision making under uncertainty and analysis of farm expansion alternatives. 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. Function of top management in agribusiness, such as: determining objectives; developing sound and consistent policies for achieving objectives; organizing the administrative personnel to carry out the plans; guiding and maintaining the administrative organization. Prerequisite: 351 and 360 or equivalents.

462-3 Advanced Agricultural Marketing. An examination of contemporary institution and determining the marketing practices of grain, livestock, dairy, and horticulture commodity producers and processors. Emphasis is placed on formulating a successful marketing strategy. Prerequisite: 362.

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: consent of instructor.

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 agriculture, 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 studies program abroad. Prior approval by the department is required both for the nature of the 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 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. 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 a 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 Agricultural Mechanization. Theory and use of educational materials and devices adaptable to the needs and interest of educators involved in agricultural mechanization laboratories. There is a \$15 additional charge 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 Micro Computing for Agricultural Education. Design of word programs and formula programs used in agricultural education applications of the micro computer. Pre-

requisite: junior class standing or consent of instructor.

472-3 Agricultural Tractors and Engines. Tractor performance and selection, principles of operation, maintenance analysis, and tuneup of multi-cylinder farm type internal combustion engines. There is a \$5 additional charge 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 in 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.

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 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. 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 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. 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 the 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 Industries

Field trips are required for certain courses.

409-4 Equine Science. Designed for students 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 in the equine and consider how they relate to selection, use, and management. Lecture and laboratory. Prerequisite: 219, 220 or equivalent, 331 or Phsl 210.

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 and Horsemanship. Laboratory experience in routines of horse care, training, and management. Field trips. Additional cost \$5. Prerequisite: 319.

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 121 or one year of biological science.

430-4 Dairy Cattle Management. Application of the principles of breeding, nutrition, 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 popu-

lation; 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.

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: Chemistry 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: Chemistry 344 and 345.

531-2 Topics in Theriogenology. Current research topics in reproduction of domestic mammals are discussed in relation to improv-

ing 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 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. 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. Language 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, ethnohistory, sociobiology, neo-Darwinism, symbolism, and cross-cultural comparison. Problem areas investigated include kinship, social structure, comparative economics, political organization, 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 culture change with emphasis on social, political, economic, artistic, religious, and linguistic behavior of humans as individuals and in cultural 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 technological society will be considered.

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 of 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 lifeways 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, tale-types, themes, and other elements; comparisons between nonliterate and literate groups. Prerequisite: none. 300D recommended for undergraduates.

410E-3 Anthropology of Law. Anthropol-

logical 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 the "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 cul-

tural development of the area. Prerequisite: 300C or 400C or consent of instructor.

440E-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, 305, 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 15 (3 per topic) Topics in Physical Anthropology. Intensive study of one of the major subfields within physical anthropology. (a) Dental anthropology. (b) Laboratory methods. (c) Primate behavior and evolution. (d) Quantitative methods. (e) Epidemiology. Prerequisite: 300a or consent of instructor.

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.

480-3 Honors Seminar. Topics to be arranged by agreement of participating faculty and students. Not open to graduate students. Prerequisite: consent of department.

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.

495-6 to 8 Summer Ethnographic Field School. An eight-week field research training program in Southern Illinois communities. Students will attend seminars on campus and in the field, but the greater part of the time will be spent engaging in continuous team research under the direction of the faculty members involved in the program. Some form of cooperative living arrangement in the field will be organized. The program is open to advanced undergraduate and graduate students. 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.

499-3 Honors Thesis. Directed reading and field or library research. The student will write a thesis paper based on original research. Not open to graduate students. Prerequisite: consent of department.

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 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. Graded *S/U* or *DEF* only.

Art

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.

400-3 to 30 (6, 6, 3, 3 to 15) Advanced Drawing I. (a) Figure drawing. Not for graduate credit. Prerequisite: 300a, b, c. **(b)** Individual research. Not for graduate credit. Prerequisite: 400a. **(c)** Senior seminar and exhibition. Not for graduate credit. Prerequisite: 400b. **(d)** Independent study in drawing. Prerequisite: for undergraduates 400b; for graduates, consent of major adviser. Incidental expenses may exceed \$50 for each section.

401-3 to 30 (6, 6, 3, 3 to 15) Advanced Painting I. (a) and (b) Individual problem solving with emphasis on technical and conceptual synthesis. Not for graduate credit. Prerequisite: for a, 301a, b, c; for b, 401a. **(c)** Senior seminar and exhibition. Not for graduate credit. Prerequisite: 401b. **(d)** Independent study in painting. Prerequisite: for undergraduates, 401b; for graduates, consent of major adviser. Studio fee for a, b, and d \$3. Incidental expenses may exceed \$50 for each section.

402-3 to 30 (6, 6, 3, 3 to 15) Advanced Printmaking. (a) Advanced techniques in printmaking to include intense work in color printing. Not for graduate credit. Prerequisite: 302, 6 hours. **(b)** Individual research with emphasis on history, processes and ideas which lead to the formation of personal content. Not for graduate credit. Prerequisite: 402a. **(c)** Senior seminar and exhibition. Not for graduate credit. Prerequisite: 402b. **(d)** Independent study in printmaking. Prerequisite: for undergraduates, 402b; for graduates, consent of major adviser. Studio fee: for a, b, and d, \$10 per credit hour enrolled. Incidental expenses may exceed \$50 each section.

403-3 to 30 (6, 6, 3, 3 to 15) Advanced Sculpture I. (a) Foundry techniques and direct metal fabrication. Not for graduate credit. **(b)** Individual research with emphasis on history, materials, processes, and ideas to form personal content. Not for graduate credit. Prerequisite: 403a. **(c)** Senior seminar and exhibition. Not for graduate credit. Prerequisite: 403b. **(d)** Independent study in sculpture. Prerequisite: for undergraduates, 403b; for graduates, consent of major adviser. Incidental expenses may exceed \$75 for each section.

404-3 to 27 (3, 6, 3, 3 to 15) Advanced Ceramics I. (a) Assigned individual problems with emphasis on ceramic form and glazing. Not for graduate credit. Prerequisite: 304, 6 hours. **(b)** Individual research with emphasis on kiln theory and design. Not for graduate credit. Prerequisite: 404a. **(c)** Senior seminar and exhibition. Not for graduate credit. Prerequisite: 404b. **(d)** Independent study in ceramics. Prerequisite: for undergraduates, 404b; for graduates, consent of major adviser. Studio fee: for a, b, and d, \$24 to \$48 per credit hour enrolled. Incidental expenses may exceed \$20 for each section.

405-3 to 27 (3, 6, 3, 3 to 15) Advanced Metalsmithing I. (a) Emphasis will be placed on advanced processes to develop individual ex-

pression. Not for graduate credit. Prerequisite: 305a and b. **(b)** Media exploration to develop individual styles. Not for graduate credit. Prerequisite: 405a. **(c)** Senior seminar and exhibition. Not for graduate credit. Prerequisite: 405b. **(d)** Independent study in metalsmithing. Prerequisite: for undergraduates, 405b; for graduates, consent of major adviser. Studio fee: for a, b, and d, \$8 per credit hour enrolled. Incidental expenses may exceed \$75 for each section.

406-3 to 27 (3, 6, 3, 3 to 15) Advanced Fibers I. (a) Individual design problems. Not for graduate credit. Prerequisite: 306b. **(b)** Individual research with emphasis on the intensive use of fibers as a creative medium. Not for graduate credit. Prerequisite: 406a. **(c)** Senior seminar and exhibition. Not for graduate credit. Prerequisite: 406b. **(d)** Independent study in fibers. Prerequisite: for undergraduates, 406b; for graduates, consent of major adviser. Studio fee for a and b, \$17 per credit hour enrolled; for d, \$15 to \$30 per semester. Incidental expenses may exceed \$75 for each section.

408-2 to 9 (2 to 3, 2 to 3, 2 to 3) Basic Research in Art Education. Each student demonstrates via class presentation, term papers and answers to exam question, a knowledge of basic research techniques and applications; important literature in the field of art education; broad research meanings; a theory of art education and material on behavioral objectives presented in class and via tape-slide self instruction programs.

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 \$12 per credit hour enrolled. Prerequisite: consent of instructor.

415-4 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. Presented in 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 2- and 3-dimension formats of plans for the reclamation of the students' chosen site with accompanying documentation.

419-3 17th and 18th Century Art. A survey of art in Europe from ca. 1550 to 1880. Architecture, sculpture, and painting will be presented as well as representative examples of the minor arts where germane to a particular style or area.

439-6 (3, 3) American Art. (a) U.S. art to 1913, study of American art from native Indi-

an settlements through Colonial period to 20th Century. Attention to such art forms as: painting, sculpture, and architecture, as well as the rich and 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 many facets of modern design. Prerequisite: 207a,b.

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.

449-3 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: 207.

457-3 Women in the Visual Arts. (Cross-listed 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.

477-3 American Art of the Thirties. A socio-political 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-subsidized art programs, and 3)recent governmental and corporate patronage of the arts through such programs as the National Endowment.

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, conography, art theory, social history, connoisseurship.

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, a 3.0 average, and consent of instructor.

500-3 to 21 Advanced Drawing II. A studio course 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 \$40 to \$80 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 \$8 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 \$20 to \$40. 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.

08-2 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 \$12 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 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. Graded *S/U* or *DEF* only.

Behavior Analysis and Therapy

(See Rehabilitation.)

Biological Sciences

(See Chapter 2 for description of the biological sciences program.)

Botany

For all field courses in botany, 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 and 205 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. Offered 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 equivalents.

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: Biology 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.

446-4 Tropical Ecology. Two weeks of marine ecology on the atolls and extensive barrier reef off the coast of Belize, British Honduras, and two weeks of terrestrial ecology at several locations inland. Cost varies yearly. Summer. Prerequisite: advanced undergraduate or graduate standing in one of the biological sciences, and concurrent enrollment in Zoology 446.

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.

449-2 Elements of Taxonomy. Principles of taxonomy including historical sketch, phyletic concepts, classical and experimental methods. One lecture and three laboratory hours per week. 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 Upland Flora. The taxonomy, ecology, and distribution of the natural vegetation in and around upland habitats of the Mississippi Basin. Prerequisite: 304 or GE-A 303 and 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 midwestern 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.

462-4 Science Process and Concepts for Teachers of Grades N-8. (Same as Curriculum, Instruction, and Media 427.) Specifically designed to develop those cognitive processes and concepts needed by elementary 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.

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; systematic 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.

492-2 to 6 Honors in Botany. Individual research problems available to qualified juniors and seniors. Prerequisite: consent of department chairperson.

500-3 Advanced Plant Anatomy. The study of advanced topics in the anatomy of

ed plants. Emphasis is on trends in and laptive nature of evolutionary modifications anatomical features and the application of anatomical data to plant systematics. Two lectures and one laboratory per week. Prerequisite: 400 and 421 or equivalent.

203-10 (5,5) Advanced Angiosperm Taxonomy. Systematic treatment of every family of flowering plants in the world. Must be taken in sequence. Prerequisite: consent of instructor.

24-2 Advanced Plant Genetics. A consideration of incompatibility systems, paramutation, cytoplasmic inheritance, developmental genetics, and other genetic topics as they occur in higher plants. Prerequisite: Biology 305 or equivalent.

25-3 Cytology. (Same as Zoology 525.) An analysis of the subcellular and cytochemical organization of the cell. Structural-functional aspects of organelles, membranes, and other subcellular components, their relationship to the metabolic nucleus, substructural organization of hereditary materials, and subcellular aspects of mitosis and meiosis are emphasized. Two lectures and one laboratory per week.

26-4 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: Biology 305 and 306, or equivalent.

32-3 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.

33-3 Plant Growth and Morphogenesis. A study of the role of the environmental variables (light, temperature, etc.) and phytohormones in the growth and morphogenesis of intact plants and tissue cultures. The theories of plant organogenesis 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.

34-2 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 morphogenesis. Two two-hour laboratories per week. Prerequisite: 320 or consent of instructor.

35-2 Energetics of Aquatic Ecosystems. Energy flows in aquatic habitats; photosynthesis and respiration rate determinations under natural and laboratory conditions; de-

termination of dominant genera in the communities; daily and annual energy budgets; factors influencing utilization of light by biotic systems; influence of daily and annual energy budgets on stratification on current systems, and on seasonal succession in the community. Prerequisite: consent of instructor.

542-2 Biosystematics. An examination of species concepts and factors affecting the formation of species. Evidence from the fields of ecology, cytotoxicology, genetics, and numerical taxonomy are discussed as well as the phenomena of hybridization, polyploidy, and apomixis. Two lecture and two laboratory hours per week. Prerequisite: 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 Forestry 331 or equivalent.

551-3 Upland Flora. The taxonomy, ecology, and distribution of the natural vegetation in and around upland habitats of the Mississippi Basin. Prerequisite: 304 or GE-A 303 or consent of instructor.

552-3 Lowland Flora. The taxonomy, ecology, and distribution of the natural vegetation in and around aquatic and lowland habitats of the Mississippi Basin. Prerequisite: 304 or GE-A 303 or consent of instructor.

570-2 to 3 Graduate Readings in Botany. 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.

584-3 Advanced Palynology. (See Geology 584.)

585-2 to 6 (2 per semester) Advanced Topics in Systematics. A series of systematic topics related to research techniques: (a) botanical nomenclature; (b) botanical Latin; (c) botanical keys and descriptions.

589-1 to 12 (1 per topic per semester) Seminars in Botany. Studies of current and historical research and literature in various topic areas of botany: (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. Every 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 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. Graded S/U or DEF only.

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, and 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.

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. (See 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 MBA program or consent of department.

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 controlling 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 lectures and two laboratory hours per week. Prerequisite: enrollment in MBA program or consent of department.

502-3 Business in our Capitalistic Society. Study of the external environment in which business in America operates; social, political, legal, and ethical dimension, interrelationships, and requirements. Prerequisite: enrollment in MBA program or consent of department.

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 MBA program or consent of department.

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 DBA program or consent of department.

519-3 Seminar in Accounting. Discussion of current accounting theories, principles, standards, and problems. Prerequisite: enrollment in MBA 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 MBA program or consent of department.

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 MBA program or consent of department.

526-3 Managerial Economics. Develop conceptual framework for business decision

making with emphasis on demand, costs, prices, and profits. Prerequisite: enrollment in MBA program or consent of department.

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 MBA program or consent of department.

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 MBA program or consent of department.

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 MBA program or consent of department.

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 MBA program or consent of department.

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 DBA 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 MBA or DBA program or consent of department.

539-3 Seminar in Finance. Current issues and practices in finance. Each student will select a problem for intensive exploration and report the findings to the class in two minor and one major report. Prerequisite: enrollment in MBA 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 MBA program or consent of department.

541-3 Operations Research II. Continuation of the survey of topics and approach taken in 501. 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 pro-

gramming, queuing, simulation and inventory theory. Prerequisite: enrollment in MBA program or consent of department.

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 MBA program or consent of department.

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 MBA program or consent of department.

545-3 Organization of Complex Systems. Analysis of organizations as complex systems. Major emphasis is placed on the latest research developments which integrate micro and macro perspectives of organizations. Additional emphasis is placed on a top management perspective of the organization. Prerequisite: enrollment in the DBA 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 MBA program or consent of department.

549-3 Seminar in Administration. Study of contemporary administrative theory and practice with focus on certain special topics, new or current trends, and research. Individual and group projects are emphasized. Specific topics to be covered will be determined by the instructor in consultation with students. Prerequisite: enrollment in MBA 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 MBA program or consent of department.

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 MBA program or consent of department.

552-3 Advanced Marketing Research and Analysis. The development of advanced procedures, methods and theory of quantitative and qualitative analysis of primary and secondary marketing data. Prerequisite: enrollment in MBA program or consent of department.

555-3 Consumer Behavior. Emphasis on theories and experimental techniques drawn

from the behavioral sciences. Prerequisite: enrollment in MBA program or consent of department.

556-3 Marketing Strategy for Organizations. Analysis of the marketing system within a changing environment. Includes consideration of institutional relationships and policy formulation as affected by business, government, and social organization. Additional emphasis on the potential relationships and possible technique transfers between marketing and other functional areas of business. Prerequisite: enrollment in the DBA program or consent of department.

558-3 Promotional Theory and Strategy. The study of the promotional elements of advertising, personal selling, sales promotion, and publicity and how each of these elements relate to marketing and the business environment. Consideration is given to key concepts, theories, and practices of the components of the promotional mix. Students will be expected to undertake research on selected topics. Prerequisite: enrollment in MBA program or consent of department.

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 MBA program or consent of department.

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.

571-3 Mission and Domain Analysis. A review of the factors influencing how managers formulate or change an organization's mission and domain. Topics include goal formulation, mission and scope definition, defining relevant environments, and strategic evaluation as inputs to the process of defining the long-range roles of private and public organizations in the broader socio-economic system. Prerequisite: enrollment in MBA or DBA program or consent of department.

572-3 Forecasting and Decision-Making Models. An analytic approach to (a) forecasting conditions that will impact on the organization and (b) evaluating the possible outcome of alternative actions. Particular emphasis is given to forecasting models, decision theory, simulation and formal planning models. Prerequisite: enrollment in MBA or DBA program or consent of department.

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 MBA or DBA program or consent of department.

574-3 Advanced Research Methods in Business Administration. A capstone re-

search course in business administration that exposes the student to a full range of research experiences. Emphasis is on integrative learning and creative thinking in the execution of the research process. Prerequisite: enrollment in DBA 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 at specific problems in dealing with foreign environments, are the principal areas of consideration. Prerequisite: enrollment in MBA program or consent of department.

591-3 Independent Study. Directed independent study in selected areas of business administration. Prerequisite: enrollment in MBA program or consent of department.

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 business administration, available business data, and analytical tools will be utilized in solving comprehensive business cases and simulation games. Prerequisite: enrollment in MBA program or consent of department.

599-3 to 6 Thesis. Prerequisite: enrollment in MBA program or consent of department.

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 DBA program.

601-1 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis research hours, usually three to six hours, before being eligible to register for this course. Graded S/U or DEF only.

Accountancy

(See course listing under Department 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.

432-3 Options and Future Markets. Study of modern concepts and issues in financial options and future markets. Emphasis on risk management in financial institutions, and applications in corporate finance and fund management. Not for graduate credit. Prerequisite: 331, and 361 or concurrent.

433-3 Portfolio Theory and Management. Examination of modern concepts relating to management of security portfolios. Topics include security analysis, Markowitz Por-

olio Theory, efficient market hypothesis, portfolio performance measurement, risk, and portfolio construction. Prerequisite: 331, 361, or concurrent enrollment.

49-3 Management of Financial Institutions. Principal policies and problems which confront management. Emphasis on liquidity, loans, investments, deposits, capital funds, financial statements, organization structure, operations, personnel, cost analysis, and public relations. Not for graduate credit. Prerequisite: 330 and 341.

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 in management of cash, marketable securities, accounts receivables, inventory, banking relationships, and short-term sources of funds. Prerequisite: 361 or concurrent enrollment.

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.

464-3 International Financial Management. Financial behavior of multinational firms. Emphasis on the modifications of conventional financial models to incorporate uniquely foreign variables. Prerequisite: 361 or concurrent enrollment.

469-3 Managerial Financial Policy. Development of financial strategies and policies based on an evaluation of alternative approaches. Emphasis upon application of financial concepts and techniques to real-life situations. Not for graduate credit. Prerequisite: 361.

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.

491-1 to 6 Internship in Finance. Designed to provide an opportunity to relate certain types of work experience to the student's academic program and objectives. Approved internship assignments with cooperating companies in the fields of finance are coordinated by a faculty member. Not repeatable for credit. Not for graduate credit. Prerequisite: consent of department chairperson and outstanding record in finance. Mandatory Pass/Fail.

495-1 to 6 Reading in Finance. Readings in classical and current writing on selected topics in various areas in the field of finance not available through regularly scheduled courses. Not for graduate credit. Prerequisite: consent of department chairperson and outstanding record in finance. Mandatory Pass/Fail.

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 Structure. The study of modern theories of complex organizations. Particular emphasis is placed on open-systems perspectives of administrative theory and the adaptation of the organization to a changing environment. Prerequisite: 341 and junior standing or consent of department.

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.

456-3 Building Decision Support Systems. 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.

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. This course is designed particularly for the student who has completed the three small business courses numbered 350 and has discussed specific small business or entrepreneurial objectives with the instructor prior to the course. Prerequisite: consent of department.

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.

481-3 Strategic Management and Policy. Development of organizational strategies and policies within environmental and resource limitations. Emphasis upon the application and integration of basic principles from all areas of business by case problem analysis, simulation exercises, and group participation. Not for graduate credit. Prerequisite: senior standing, 304, 318, Finance 330, Marketing 304, or equivalent.

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.

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 organization's human resources to best advantage. Prerequisite: 341, junior standing or consent of department.

489-6 (3, 3) Seminar. Investigation of selected special or advanced topics in seminar format. Topics may include, but are not limited to: management responsibility in society, wage and salary administration, health services administration, data processing management, current issues in management, etc., (a) management, (b) decision sciences. May be taken singly; a student normally takes only one of the two options. Prerequisite: consent of department.

491-1 to 6 Independent Study. Utilizes special faculty resources to enable individually, the exploration of an advanced area of study through research by means of data analysis and/or literature search. Prerequisite: consent of department.

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 a managerial perspective. Prerequisite: 304 and junior standing or higher.

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.

438-3 Sales Management. Analysis of the management of the sales effort within the marketing system. Philosophies, concepts, and judgement criteria of the sales function in relationship to the total marketing program. Prerequisite: 304 and Management 304 or 301 and junior standing or higher.

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.

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, organiza-

tion, and management of the system. Prerequisite: 304 and junior standing or higher 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.

493-3 Marketing Policies. A comprehensive and integrative view of marketing policy formulation. Marketing decisions analyzed and discussed. Prerequisite: 329, 363, and 401 (not more than one to be taken concurrently) and junior standing or higher.

499-1 to 6 (1 to 3, 1 to 3) Marketing Insights. Provides the student an opportunity to participate in an internship program, independent study, or seminar coinciding with areas of interest. May be repeated for credit only when topics vary. Prerequisite: junior standing or higher, approval of the instructor and the department chairperson in the semester prior to enrollment.

Business Education

(See Vocational Education Studies.)

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: 460 or 462a or concurrent enrollment in either.

416-3 X-Ray Crystallography. (See Geography 416.) Prerequisite: 224 and 225, or 222b, or year of college physics and Mathematics 150.

431-4 Environmental Analytical Chemistry. Practical applications of common instrumental and wet methods to the determinations of chemical substances in common natural and commercial materials. Techniques will include titrimetry; quantitative analysis of liquids and solids; gas, thin-layer and ion exchange chromatography; atomic absorption; flame photometry; ion selective electrode potentiometry; and spectrophotometry. T

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.

434-4 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 credit hours. Enrollment for two credit hours is restricted to graduate students in the Department of Chemistry and Biochemistry advised to take instrumental analysis. Prerequisite: one semester of physical chemistry or concurrent enrollment in 462a or 460.

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 determination. Emphasis will be 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 lectures and six hours of laboratory per week. Prerequisite: 226 and either 346 and 349 or consent of instructor.

450-3 or 4 Survey of Biochemistry. Chemistry, function, and metabolism of amino acids, proteins, enzymes, carbohydrates, lipids, and nucleic acids. For students desiring a terminal, one-semester survey of biochemistry. Three lectures per week for 3 credits. Students desiring laboratory experience register for 4 credit hours in an appropriate laboratory section; one laboratory per week. Prerequisite: 346 and biological science.

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.

460-4 or 5 Principles of Physical Chemistry. A one-semester course in physical chemistry designed especially for non-chemistry majors. Not for those who intend to be professional chemists. Chemistry majors taking 460 instead of 462a,b, must take the laboratory. Non-chemistry majors may take the course for 4 credits and omit the laboratory. Four lectures and one three-hour laboratory per week. Prerequisite: 222a,b, Math 150 or 140; Chem 226b is corequisite for the laboratory option.

462-8 or 10 (4 or 5, 4 or 5) Physical Chemistry. Four lectures and one three-hour laboratory per week. Enrollment for lectures only is restricted to graduate students in the department who are advised by the department in special cases. (a) Classical thermodynamics and its applications, statistical thermodynamics, and chemical kinetics. (b) Quantum mechanics of atoms and molecules, molecular spectroscopy. Laboratory work includes analysis of data, computational techniques, and typical chemical measurements. Prerequisite: (a) 226b, Mathematics 251; (b) 462a, Mathematics 305 recommended. Must be taken in a, b sequence.

471-2 Industrial Chemistry. A survey of modern industrial chemistry and an introduction to chemical research processes. Two lectures per week. Prerequisite: 346 and 347 or 349.

489-1 to 3 Special Topics in Chemistry. Prerequisite: consent of instructor and 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.

496-1 to 8 Undergraduate Research (Honors). Introduction to independent research under the direction of a faculty member culminating in a written report. Not for graduate credit. Prerequisite: a 3.0 grade point average, five semesters of chemistry laboratory including one semester of physical chemistry, and consent of instructor and department chairperson.

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 9 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 Eur-

karyotic molecular biology. (b) -1 Chemical data analysis. (c) -2 Chemistry and biochemistry of biological membranes. (d) -2 Biophysical methods. Prerequisite: 451a, b or equivalent. Microbiology 460 recommended.

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 per week. Prerequisite: 462a, b or consent of the instructor.

565-3 Group Theory. Applications of group theory to quantum mechanics and spectroscopy. Three lectures per week. Prerequisite: 462a, 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 special fields of chemistry with individual instruction by a staff member. (a) Analytical, (b) biochemistry, (c) inorganic, (d) organic, (e) physical 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 advisor committee. Graded S/U only. Prerequisite: consent of chairperson.

599-1 to 6 Thesis. Maximum credit six hours. Prerequisite: consent of chairperson.

600-1 to 30 (1 to 12 per semester) Dissertation ND Doctoral. Requirement for Ph.D. degree, 24 hours. Maximum credit 30 hours, except by permission of the student's graduate advisory committee. Prerequisite: 598, 322 and consent of department.

601-1 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. 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. Lab fee. 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 pho-

tographic materials. \$15 laboratory fee. Prerequisite: 320 and consent of department.

405-3 Applied Photography I. Theory and practice of contemporary commercial/industrial photography. Students provide materials and may purchase texts. Lab fee. Prerequisite:

406-3 Applied Photography II. Practice and ideas of advertising/illustrative and editorial photography. Students purchase materials and may purchase props, texts, and equipment. Lab fee. Prerequisite: 405 and consent of department.

407-3 Publications Photography I. History, theory, and practice of photographic news reporting with emphasis on production and design of picture stories and essays. Students purchase texts and provide photographic materials and chemicals. \$15 cost for additional laboratory materials. Prerequisite: 322 and consent of department.

408-3 Publications Photography II. History, theory and production of picture essays, including research, lay-out, captions and text. Black and white and color. Students purchase texts and provide photographic materials and chemicals. \$15 cost for additional laboratory materials. Prerequisite: 407 and consent of department.

418-3 Documentary Photography. Survey of the history and theory of documentary still photography. Production of documentary photographic essays dealing in depth with an aspect of contemporary life. Students purchase texts and provide photographic materials and chemicals. \$15 cost for additional laboratory materials. Prerequisite: 322 and consent of department.

420-3 Experimental Camera Techniques. Experimental approaches to the creation of photographic images in the camera. Students purchase texts and provide photographic materials and chemicals. \$15 cost for additional laboratory materials. Prerequisite: 322 and consent of department.

421-3 Experimental Darkroom Techniques. Experimental darkroom manipulations of the straight camera image. Students purchase texts and provide photographic materials and chemicals. \$15 cost for additional laboratory materials. Prerequisite: 322 and 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 purchase texts and provide photographic materials and chemicals. \$15 cost for additional laboratory materials. Prerequisite: 322 and consent of department.

425-3 to 9 Studio Workshop. An intensive workshop focusing on current trends in photography as a fine art. Topics offered have included landscape photography, architectural photography, imagemaking, introduction to the studio, among others. Students provide photographic materials and chemicals. \$15 cost for additional laboratory materials. Prerequisite: 322 and consent of department.

426-3 Nonsilver Photography. An advanced course in which the student will learn the basics of working with the hand-applied emulsions of cyanotype, vandyke brownprinting, and gum printing. Students provide materials and chemicals. \$15 laboratory fee. 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. Screening fee. It is strongly recommended that C&P majors complete 349 and 360 prior to taking 449.

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 animated techniques: developmental, filmographic, rear lit, cut out, line, cel, etc. Students purchase texts, art supplies film materials, and processing. Prerequisite: 355 or consent of department.

455-3 Film Production III. Advanced production by individuals or crews of 16 mm 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. 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 problems. Students provide editing and sound materials and are responsible for laboratory costs. 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. 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. Screening fee. Students purchase texts.

465-3 History of the Animated Film. Study of the history, techniques, and aesthetics of the graphic/animated film. Students purchase texts. Screening fee.

466-3 to 6 Film Styles and Genres. Intensive study of a specific body of films grouped by similarities in style, genre, period, or cultural origin. Emphasis on historical, theoretical, and critical issues. Topics vary each semester. Examples: the Western; the French New Wave, Third World cinema; Surrealism in film. Screening fee.

467-3 to 6 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. Examples: the films of Alfred Hitchcock, the films of Jean Renois. Screening fee.

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 film. Screening fee. 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 have 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 other. (d) Advanced studies in interdisciplinary topics. Not more than 6 semester hours may be counted for graduate credit. Screening/lab fee. 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 assignment. Topics vary; may be repeated for a total of 6 credits. Students provide photographic materials and chemicals and may purchase text. 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 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.

491-1 to 9 Individual Study in Cinema or Photography. Research in history, theory, or aesthetics. Not more than 9 semester hours of 491, 495, and 497 combined may count toward the first 38 hours for the B.A. in cinema and photography. Not for graduate credit. Prerequisite: consent of department.

492-1 to 3 Practicum. Practical experience in the presentation of photographic theory and procedures. Does not count toward the first 38 hours for the B.A. in cinema and photography. Not for graduate credit. Prerequisite: consent of department. Mandatory Pass/Fail.

495-1 to 12 Internship in Cinema or Photography. Used to recognize experience with professional film or photographic unit. Not more than 9 semester hours of 491, 495, and 497 combined may count toward the first 38 hours for the B.A. in cinema and photography. Not for graduate credit. Prerequisite: consent of department. Mandatory Pass/Fail.

497-1 to 9 Projects in Cinema or Photography. Individual or crew projects in motion picture production or still photography. Not more than 9 semester hours of 491, 495, and 497 combined may count toward the first 38 hours for the B.A. degree in cinema and photography. Not for graduate credit. Prerequisite: consent of department.

499-4 Senior Thesis. Preparation of a film, critical or research paper under the supervision of a cinema and photography faculty member. Normally taken during the last term in residence, the senior thesis is evaluated by the department faculty. The department will retain one copy of all theses. Students interested in producing a film for 499 should have completed 355, 356, 368, and 452 and 9 hours of cinema history courses. Not for graduate credit. Prerequisite: consent of department. Mandatory Pass/Fail.

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 semology 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 partici-

pants. (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 MFA Projects. Supervised independent creative work, the amount and exact nature of which is to be determined in consultation with the cinema and photography faculty. Prerequisite: admission to the MFA program and consent of department.

598-1 to 6 MFA Final Creative Project. Supervised independent creative work leading to the completion of the MFA creative project requirement. Registration for six hours of 598 is required of each MFA candidate. Prerequisite: admission to the MFA program and consent of the department.

601-1 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. Graded S/U or DEF only.

Communication Disorders and Sciences

408-3 Communication 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. Association problems of personal and social adjustments are also examined. Prerequisite: 105, 214, 318, or consent of instructor.

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, 316, and/or equivalents or consent of instructor.

420-3 Introduction to Audiological Disorders and Evaluation. Bases of professional field of audiology (orientation, acoustics, anatomy, and physiology of the auditory system), major disease processes influencing hearing and their manifestations, measurement of hearing loss. Prerequisite: 3.0 GPA in program retention courses or concurrent enrollment and consent of instructor, or graduate standing.

428-3 Communication Disorders and the Classroom Teacher. Etiology and therapy of common speech defects. May be taken by all inservice teachers, seniors, and graduate students in education.

431-1 to 6 (1 to 3, 1 to 3) Biofeedback Communication. An investigation into the experimental approaches for the study of the phenomena of speech. Evoked potential and signal averaging techniques, psychophysiol-

ogical methodology. Laboratory experience with various biofeedback instrumentation, EMG, EEG, temperature, ECG, etc. Open to non-majors.

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. For non-majors only. 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.

485-1 to 3 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.

489-1 Seminar in Developmental Psycho-Neurolinguistics. Seminar will explore 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 interpreted to mean life-span. Same as Psych 489 and Ling 489. Prerequisite: consent of instructor(s).

491-1 to 4 (1 to 2, 1 to 2) 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.

494-1 to 12 (1-4 per area) Advanced Clinical Practice: Speech/Language. Advanced clinical practicum in (a) articulation and phonology, (b) language disorders, (c) voice disorders, and (d) fluency disorders. Emphasis will be placed on specialized therapy procedures, diagnostic techniques, and the preparation of reports. Prerequisite: (a) 302, 392, and 393 or equivalents and consent of the chairperson; (b) 303, 392, and 393 or equivalents and consent of the chairperson; (c) 318, 392, and 393 or concurrent enrollment or equivalent courses and consent of the chairperson; (d) 319, 392, and 393, or equivalent courses and consent of the chairperson.

496-1 to 2 (1, 1) Advanced Clinical Practice: Hearing Disorders. Advanced clinical practice in hearing disorders. Emphasis will be placed on rehabilitative procedures in audiology. Prerequisite: 316 and 493 or equivalents and consent of chairperson.

497-1 to 2 (1, 1) 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: 316, 420, and 49 or equivalents and consent of chairperson.

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: 20 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 functions 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 pyrami-

dal 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 6 (1 to 3, 1 to 3) Professional Training Seminar. A special seminar of a predetermined area of speech pathology and audiology. Each student is expected to prepare and present papers on various aspects of the topic to the group. Liberal discussion will follow each paper. The seminar will be conducted by a faculty member specialized in the area of the topic selected. All doctoral students are required to enroll for a minimum of one credit during the first four semesters in residence.

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 chairperson.

593-1 to 3 Research Problems in Speech-Language Pathology and Audiology. Individual work upon selected problems for research. Prerequisite: consent of chairperson.

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 chairperson.

599-1 to 6 Thesis.

600-1 to 32 (1 to 16 per semester) Dissertation.

601-1 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, be-

fore being eligible to register for this course. 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 Social Work 495. May not be taken for credit if credit has been earned in 389 or Social Work 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 upper classmen 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 Social Work 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 practice 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 terminal research report or advanced field pro-

ect. 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 chairperson.

601-1 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. Graded *S/U* or *DEF* only.

Computer Science

401-3 Computer Architecture. Review of logical circuit design. Processor design including control unit and arithmetic logic unit. Memory organization. Input/output. High speed and fault-tolerant computing. Prerequisite: 306 and 315 each with a grade of *C* or better.

411-4 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.

414-3 Systems Programming and Operating Systems. The use and implementation of assemblers, macro assemblers, linkers, and other systems programs. Exercises in designing and writing various systems programs. An introduction into process, memory, device, and file management in batch, multiprocessing, and time-shared operating systems. Prerequisite: 306 and 330, each with a grade of *C* or better.

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.

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, modular design, human interfaces, external system specification, program design languages, and improved programming techniques. Prerequisite: 306 and 330, each with a grade of *C* or better.

436-3 Artificial Intelligence I. Heuristic programming. Heuristic methods: state space, problem reduction, game playing, general problem solver, learning machines. Prerequisite: 220 and 302 each with a grade of *C* or better.

440-3 Introduction to Computer Networks. Design and analysis of computer communication networks. Topics to be covered include: data transmission, data link protocols, topological design, routing, flow control, security and privacy, distributed data processing, network performance evaluation. Prerequisites: 306 and 315 each with a grade of *ITALC* or better and Math 380.

447-3 Introduction to Graphy Theory. (Same as Math 447.) Introduction to theory of graphs, digraphs, and network 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 Headwood's Theorem, weak and strong connectivity in digraphs, existence of direct paths and cycles in tournaments, flows in networks and Ford-Fulkerson Theorem. Prerequisite: Math 221 and one of Math 319, CS 315, or Engin 335.

449-3 Introduction to Combinatorics. (Same as Mathematics 449.) An introduction to combinatorial mathematics with computing applications. Topics include permutations and combinations, generating functions, recursion, inclusion and exclusion, coding theory, block designs. Prerequisite: 315 or Math 319 or consent of department.

451-3 Introduction to the Theory of Computing. (Same as Mathematics 451.) The fundamental concepts of the theory of computation including finite state acceptors, formal grammars, turing machines and recursive functions. 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. Introduction to analysis and complexity of algorithms. Searching/sorting algorithms, polynomial 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. Must be taken in a, b sequence. Prerequisite: 202 and Mathematics 221 and 250.

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 model. Development of the simplex method. Application of the model to various problems. Introduction to duality theory. Transportation and network flow problems. 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. Processor-Memory-Switch and Instruction Set Processor notations. Design concepts for multiprogrammable machines. Stack computers. Overlap and pipeline processing. Microprocessors. Microprogrammable machines and bit slices. Parallel processing. Other current topics in computer organization. Prerequisite: 401.

511-3 Formal Specification of Program-

ming 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.

514-3 Advanced Operating Systems. Design and analysis of multiprogramming, multiprocessing, and time-sharing operating systems. An in-depth study of a particular operating system. Exercises in designing and writing various operating systems routines. Parallel processing, protection mechanisms, and other current topics in operating systems. Prerequisite: 414.

516-3 Advanced Compilers. A continuation of 416 including advanced topics in lexical and syntax analysis, error recovery, semantic analysis, code optimization, and compiler compilers. Prerequisite: 416.

530-3 Advanced Data Base System. A detailed treatment of advanced topics in database 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 to 6 Advanced Topics in Computer Systems. A rigorous study of one or more topics relevant to computer organization, system architecture and design. Topics may include but are not limited to (a) parallel processing, (b) VLSI system architecture and design, (c) fault-tolerant computing systems, and (d) advanced microprocessor systems design. Issues related to design, security, communication, operating systems, and application programming may be covered. Prerequisite: 401 and consent of instructor.

553-3 Formal Languages and Automata (Same as Mathematics 528.) 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. (Same as Mathematics 529.) 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. Poly-

omial time approximation algorithms for P-complete problems. Prerequisite: 451.

64-3 to 9 (3, 3, 3) Advanced Numerical Analysis. (Same as Mathematics 572.) Selected topics chosen from such areas of numerical analysis 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.

70-3 to 9 per topic (3, 3, 3) Topics in Operations Research. (Same as Mathematics 70.) (a) Netflows. Builds on network and generalized network models for the transportation, transshipment, assignment, shortest path, maximal flow. Prerequisite: 472 or Mathematics 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 Mathematics 480 or 483. (c) Large scale linear programming. Advanced L.P. techniques for sparse matrices and reinversion routines. Prerequisite: 472 or Mathematics 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 Mathematics 472.

90-1 to 9 Readings. Supervised readings in selected subjects. Graded *S/U* only. Prerequisite: consent of instructor and department.

91-1 to 9 (1 to 3 per topic) Special Topics. Selected advanced topics from the various fields of computer science.

92-1 to 6 (1 to 3 per semester) Special Problems. Individual projects involving independent work. Graded *S/U* only. Prerequisite: consent of department.

93-1 to 4 Seminar. Preparation and presentation of reports. Graded *S/U* only. Prerequisite: consent of instructor.

99-1 to 5 Thesis. Minimum of three hours to be counted toward a master's degree. Prerequisite: consent of department.

01-1 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. Graded *S/U* or *DEF* only.

Curriculum, Instruction, and Media

00-2 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.

405-3 Infant Stimulation and Care. Application of theories in infant development in care and stimulation practicum. Development of competencies and skills needed by infant specialists and professionals. Two hours seminar, 4 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.

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 experiences. 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 preschool 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 is on understanding the problems of the individual whose literacy level does not permit full participation in the economic, social, and civic opportunity 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.

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. Include bibliographies in education, periodical literature, College of Education publications, dissertation and thesis indexing services, and 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 field of interest.

437-3 Educational Media in Training Programs in Business and Industry. For those persons interested in the role that media plays in current training practices in business and industry. Emphasis is directed toward a understanding of the rationale for using media, a review of the various methods utilized in training programs, an examination of current training media, and a description of methods used to evaluate the effectiveness of training media. Includes an examination of the roles of professions who develop media for training.

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. A \$10 laboratory fee is required. Prerequisite: 450 or consent of instructor.

453-3 Production of Educational Media I. Principles, skills, and techniques in the design and production of basic nonphotographic edu-

ational media. Experience includes applying lettering, coloring, and mounting techniques on projected and nonprojected media.

455-3 Organization and Production of Media for Self-Instruction. The study of various programming techniques and the procedures used in producing, designing, and evaluating materials used for self-instructional purposes. Includes organizing a teaching segment and producing the needed materials to create a self-instructional package.

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 extraclass 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 post-secondary school 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 is spent practicing teaching models, designing materials, and developing teaching units. Emphasis also is placed on techniques for individualizing instruction for 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 of Microcomputers. A study of the development and use of microcomputers and microcomputer 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 experience in using authoring systems, languages and utilities for design, production and integration of computer-assisted instruction into educational settings. Tools will include Superpilot, Author, and various commercial and consortium authoring tools. Prerequisite: CIM 480 or permission 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. Acquaints teachers within a single school system or in a closely associated cluster of school systems with underlying assumptions and practical considerations involved with the 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, (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, (q) family studies, (r) computer based education, (s) gifted and talented education, and (t) teaching 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 instruc-

tional 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 Supervision of Professional Education Experiences. The role and responsibility of the cooperating public school teacher in the supervision of teacher education students, involved in various field experiences. Attention is given to the joint responsibilities of the university and the public school in this cooperative venture. For present and prospective teachers who wish to effectively deal with students in the various professional education experiences.

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 elementary 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 princi-

ples 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.

521-8 (4, 4) Diagnosis and Correction of Reading Disabilities. Causes of reading difficulties, observation and interview proce-

ures; standardized tests, instruments, and informal inventories; analysis techniques; experiences in preparing materials for corrective purposes. Each student diagnoses and treats a reading disability case under supervision. Prerequisite: 512 or 561 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 classroom 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 solv-

ing 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.

553-2 Instructional Design. The primary purpose of the course is to give the students experience in designing and producing materials for real instructional settings in cooperation with professional instructional staff members. Advanced graphic production methods and developing evaluation skills are also included. Prerequisite: 450, 453 or consent of the instructor.

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 mi-

crocomputer operation, software utilization, program evaluation, creation and use of microworlds in the classroom, 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 teacher 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; curricular 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. A 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 of Our 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.

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 Developments in Major Subject Areas in Secondary Schools. Trends, issues, problems in the subject areas of the secondary school, 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 to-

ward 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 appli-

cation 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 16 per semester) Dissertation. Minimum of 24 hours for the Doctor of Philosophy degree.

601-1 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. 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, decision making, index numbers, time series analysis, forecasting, and other statistical techniques used in analyzing economic and business data. No graduate credit for economics majors. Prerequisite: 308 or equivalent.

416-3 Money and Banking II. An examination of the principal 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: 311 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, 341, 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.

36-3 Government and Labor. (Same as Political Science 428.) 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: GE-B 211 and 212 or equivalents or consent of instructor.

40-3 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.

41-3 Contemporary Macroeconomic Theory. An examination of 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 incomes policies facing the United States government. Not open to students who have had 341. Prerequisite: 214 or consent of instructor.

43-3 Honors Seminar in Economics. Application of the tools of economic analysis to the study of contemporary social problems. Enrollment limited to economics 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, 341, and Mathematics 117, or 140, or 150, or consent of instructor.

50-3 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 GE-B 211; or consent of instructor.

65-4 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.

67-3 Introduction to Econometrics. Introduction to the use of statistical inference and distribution theory for measuring and testing economic theory. Emphasis placed on the linear model, least squares estimation, hypothesis testing, and the underlying assumptions. Prerequisite: 308 and Mathematics 117, or 140, or 150, or consent of instructor.

71-3 Land Resource Economics. (See Agribusiness Economics 440.)

74-3 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: 374, or 340, or consent of instructor.

79-3 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.

81-3 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 chairperson.

502-1 to 4 Readings in Resource Economics. (See Forestry 590.)

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. 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.

512-3 Seminar in Labor Institutions. Multi-disciplinary 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. 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. Taken in A,B,C sequence with consent of instructor. Prerequisite: 340 or 440 or consent of instructor.

540B-3 Microeconomic Theory II. Taken in A,B,C sequence with consent of instructor. Prerequisite: 540A or consent of instructor.

540C-3 Microeconomic Theory III. Taken in A,B,C sequence with consent of instructor. Prerequisite: 540B 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) Econometrics I and II. (a) Linear regression analysis as applied to single equation economic models. Problems of least squares, maximum likelihood, and Bayesian estimation techniques in stochastic economic models. (b) Elements of asymptotic distribution theory and estimation techniques in multiple equation economic models. Take in a, b sequence except with consent of instructor. Prerequisite: 565, or Mathematics 483, 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.

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 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. Graded *S/U* or *DEF* only.

Education

400-1 to 4 Student Teaching. A requirement in the undergraduate professional education sequence, 400 represents preliminary student teaching experiences necessary for certification by entitlement. For undergraduate students who are majoring in special education and are seeking entitlement to more than one teaching certification in the state of Illinois. Enrollment in this course must be arranged through the Office of Teacher Education. For undergraduate credit only. Prerequisite: admission to the Teacher Education Program, acceptance for student teaching, and concurrent enrollment in Educ 312.

401-1 to 12 Student Teaching. A requirement in the undergraduate professional education sequence, 401 concludes the sequence of field experiences necessary for certification by entitlement. For undergraduate credit only. Prerequisite: admission to the Teacher Education Program, acceptance for student teaching, and concurrent enrollment in Educ 317.

402-5 to 8 Student Teaching for Provisionally Certified Teachers. Offered for purposes of converting a provisional teaching certificate to a standard teaching certificate. The student teaching experience may be provided for in the position of employment under the supervision of a university supervisor. Enrollment in the course must be arranged with the coordinator of professional education experience in the Office of Teacher Education. For undergraduate credit only. Prerequisite: consent of instructor, provisional certificate, and teaching experience.

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.

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.

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 resources of scholarship in other disciplines which might be said to be foundational to education. Prerequisite: admission to the Ph.D. program in education.

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 foundation bases for differential education for the gifted (DEG); i.e., establishment of a historical, philosophical, epistemological, and sociological frame work for the emerging sub-field of education.

421-3 The Law, The Teacher, and The Student. Legislative and case law including civil rights and responsibilities for the teacher and for the student.

430-3 History of Education in the United States. An historical study of the problems of American education.

431-3 Workshop in Adult in Adult and Community Education. (See Educational Leadership 431.)

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 inservice 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 of 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 in-

struction 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 the study of institutional settings. Both quantitative 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.

505-2 Organization and Administration of the Middle and Junior High School. Focuses on the problems and processes of the administration and organization of the middle school or the junior high school.

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, 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 Teacher and College Teaching. A study of the professional roles of academic people: as teachers, scholars, researchers, members of the professions, and faculty members. Emphasis is placed on classroom strategies to extend educational opportunities, the characteristics and values of faculty members, the teaching-learning process, models of effective behavior, and academic freedom.

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.

529-3 Supervision of Personnel: Problems. Supervision of personnel problems and tasks as they relate to educational organization and goals. Emphasis is given to an analysis of supervision of personnel problems arising from changing developments in organization.

530-3 Historical Research in Education. Seminar designed to explore the literature, methods, and possibilities of historical research in education.

531-3 School Boards and Policies. 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 principals. 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-h-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.

536-3 Organization and Administration of Adult and Continuing Education Programs. Review of methods and procedures for working 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-evaluated 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 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 Systems and Accountability. An in-depth study and examination of the methods of determining accountability in education. An examination of educational organizations as complex systems will be made in conjunction with the application of specific administrative techniques applied to practical educational problems. Cost, time, and demand functions will be analyzed from an efficiency and effectiveness standpoint. Open to approved sixth-year and doctoral students. Prerequisite: 551.

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: EAHE 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 struc-

ure, and organizations and their social environment. Prerequisite: 503 or equivalent.

556-3 Seminar in History of European Education. A survey and interpretation of education in Europe from the Greek era to the present. Stresses the relationship of European to American education.

558-3 Advanced Seminar in Comparative/International Education. A cross-examination of specific educational cases based on an analysis of natural, religious, and secular factors that affect education and culture on the whole. This followup seminar of 552 exposes professional educators to comparative methodology and prepares them for specific case studies or policy studies in education. Prerequisite: 552 or consent of instructor.

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 services, 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.

592-1 to 6 Special Problems (Individual). Selection, investigation, and writing of a special research project under the personal supervision of a graduate faculty member. Graded *S/U* only. Not available to students in doctoral programs. 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.

599-1 to 6 Thesis.

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 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. 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 procedures.

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 men-

tal 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.

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. Prerequisite: consent of instructor.

491-1 to 6 Special Research Problems--Individual Study. For majors. Formulating, investigating, and reporting on a problem in the area of guidance. 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 or 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 (3, 3) 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: consent of instructor.

506-4 Inferential Statistics. Covers basic descriptive techniques such as central tendency, measures of variability and graphics presentation of data. In addition, hypothesis testing, analysis of variance, nonparametric 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. 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. Psychology 407 or equivalent is recommended.

512-3 Affective and Cognitive Behavior 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 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 application 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.

21-3 Analysis of Classroom Behavior--Consultative Practices for School Personnel. Trains school pupil personnel to serve as a consultant to classroom teachers regarding prevention and modification of undesirable classroom behaviors.

25-3 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.

30-3 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.

31-3 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: Educational Psychology 506.

32-3 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.

33-4 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: 494d, 532.

37-3 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.

38-3 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.

40-3 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. Prerequisite: 533.

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 re-

garding 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.

595-4 to 8 (4, 4) 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. Prerequisite: 512, 513, 518, 540, and the 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 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 master's degree in educational psychology of 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 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis research hours, usually three to six hours, before being eligible to register for this course. Graded S/U or DEF only.

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, operator on inner product spaces, spectral theorem with applications, Fourier series, two-point boundary value problems, special functions of engineering analysis, calculus of Fourier 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 for management systems.

540-3 Design of Engineering Experi

ments. 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.

45-3 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.

50-3 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 and (i) nonlinear structural analysis. Advanced topics in materials include: (j) fracture mechanics and dislocation theory. Prerequisite: consent of instructor.

51-3 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.

60-1 to 2 Seminar. Study and oral presentation of selected problems in advanced engineering and science. Prerequisite: enrollment in the Ph.D. in engineering science program and consent of instructor.

60-1 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.

60-1 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.

60-1 to 12 per semester, Continuing Research. Hours and credits to be arranged by associate dean for graduate studies. Graded *S/U* 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.

415-3 Wastewater Treatment. A study of the design equations used in physical, chemical, and biological treatment processes and comparison to design by state standards. Basics of bacteria and their metabolic processes in the degradation of organic wastes. Treatment and disposal of sludges produced in wastewater treatment. Advanced waste treatment processes; reuse of wastewater. Concurrent enrollment in 417 is recommended. Prerequisite: 314.

417-1 Water Quality Laboratory. Measurements of water quality parameters performed. Use of modern instrumental techniques demonstrated. Safety glasses are required. 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.

421-3 Foundation Design. Application of soil mechanics to the design of the foundations of structures; bearing capacity and settlement analysis; stability of earth slopes; design of retaining walls, pile foundations, coffer dams. Prerequisite: 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 or consent of instructor.

442-3 Structural Steel Design. An introduction to structural steel design with emphasis on buildings. Composite design. Plate girders. Rigid frames. Prerequisite: 340 or consent of instructor.

444-3 Reinforced Concrete Design. Behavior and strength design of reinforced concrete beams, slabs, compression members, and footings. Prerequisite: 340 or consent of instructor.

445-3 Reinforced Masonry Design. Materials. Loads, wall, columns, and pilasters. Beams. Lateral-load resisting elements. Connections and joints. High-rise structures. Environmental features. Quality control. Prerequisite: 340 or consent of instructor.

446-3 Prestressed Concrete Design. Fundamental concepts of analysis and design. Materials. Flexure. Shear and torsion. Deflections. Prestress losses. Composite beams. Indeterminate structures. Slabs. Bridges. Prerequisite: 444.

451-3 Introduction to Finite Elements in Engineering Applications. (Same as Engineering Mechanics 451.) An 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: EM 351 or equivalent.

462-3 Matrix Methods of Structural Analysis. Flexibility methods and stiffness method applied to framed structures. Introduction to finite elements. Prerequisite: 340 and Engineering 222 or consent of instructor.

480-1 Civil Engineering Seminar. Civil engineering as a profession. Basic concepts of professionalism. Engineers' inherent responsibilities to society, client or employer, and other members of the profession. The role of ethics in engineering. Prerequisite: senior standing.

483-3 Senior Design Project in Civil Engineering. A comprehensive design course emphasizing the preliminary and overall design of civil engineering projects using a team approach. Students will define and design the various components and subsystems of the project, define subsystem interface requirements, integrate the subsystems into the final design, and document the whole design in the form of a final report and an oral presentation. Laboratory. Not for graduate credit. Prerequisite: 413, 415, 442, 444, and senior standing in civil engineering.

492-1 to 4 Special Problems in Engineering. Selected engineering topics or problems in (a) structural engineering, (b) hydraulic engineering, (c) environmental engineering, and (d) applied mechanics. Four hours maximum course credit. Prerequisite: consent of instructor.

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.

515-3 Transient Hydraulic Transport. (Same as Engineering Mechanics 515.) Unsteady motions in single and multiphase, incompressible, and compressible flow in pipe and incompressible flow in open channel systems. Numerical analysis and control of water hammer, 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 waste. Case studies of major industrial waste problems and their solutions. Prerequisite: 415.

518-3 Advanced Biological Treatment Processes. The biochemical and microbiological 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.

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 Inelastic Metal Structures. Rigid-plastic and elastic-plastic behavior, analysis and design of metal structures including slender members and skeletal frames. Design of multi-story buildings and bridges. Prerequisite: 442 or consent of instructor.

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.

580-1 to 4 Seminar. Collective and individual

al study of selected issues and problems relating to various engineering areas. Registration or 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.

992-1 to 5 Special Investigations in Engineering. Advanced engineering topics and/or 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.

999-1 to 6 Thesis.

101-1 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. 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.

21-2 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 nonlinear 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.

26-4 Microcomputer Systems. Application and makeup of microcomputer systems. Microprocessor programming and applications with various interface devices including input/output ports, analog-to-digital and digital-to-analog converters. Lecture, laboratory, and design project. Three hours of lecture and two hours of laboratory per week. Prerequisite: Engineering 222, 225, and 345 or consent of instructor.

27-3 Digital Systems Design I. Advanced concepts in combinational and sequential circuit design including system design procedures and register transfer languages. Prerequisite: Engineering 222, 225, and 345 or consent of instructor.

28-3 Digital Hardware Design-I. Fundamentals of digital hardware design. Systems with a microcomputer as the controller. Microcomputer buses and interfaces. One major design-and-construction project laboratory.

Prerequisite: 427, or 465, or the consent of the instructor.

443-4 Electrical Engineering Design. Projects of an electrical engineering systems design nature. Students select a problem, define and design the various subsystems, define subsystem interface requirements, integrate the subsystems into the final design, and document the design effort. Laboratory. Not for graduate credit. Prerequisite: senior standing.

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: 455 or concurrent enrollment; Engineering 345.

447-3 Applications of 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. Three hours of lecture and two hours of laboratory per week. Prerequisite: Engineering 222, 312, and 345.

448-3 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. Three hours of lecture and two hours of laboratory per week. Prerequisite: Engineering 345.

455-3 Linear Systems. Fundamental techniques in analysis of linear systems. Transient analysis of linear electrical networks and analogous systems by classical, Laplace-transform, and computer techniques. Feedback, frequency response, and state variables. Prerequisite: Engineering 335 and Mathematics 305.

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: 455.

457-3 Systems Theory. In-depth study of system such as interaction, anticipation, feedback, feedforward, stability, and memory. Methods which maintain flexibility and generality in dealing with all types of engineering systems. Prerequisite: Mathematics 305 or consent of instructor.

458-3 Communications Theory. Basic information theory. Fourier series and transform. Sampling theory. Amplitude modulation, frequency modulation, and pulse modulation. Signal-to-noise ratio. Statistical methods. Prerequisite: 455.

459-3 Digital Control. Analysis and design methods for 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 455.

461-4 Bio-electricity and Biomedical Instrumentation. Interdisciplinary course primarily for life-science students. Electromagnetics relative to living systems. Circuit analysis. Functional electronics. Electric safety. Specific clinical and research instrumentation. Lecture and laboratory.

462-3 Biomedical Instrumentation and Measurements. (Same as Physiology 462.) Diagnostic and therapeutic modalities related to engineering. Includes study of electrocardiography, ultrasonography, and chemical instrumentation; radiation therapy, electrosurgery, and prosthetic design. Prerequisite: senior standing in any branch of engineering and at least one course in human physiology or consent of instructor.

465-3 Instrumentation. Theory and practice related to measurement systems for research and industry. Instrument characteristics. Techniques in analog and digital instrumentation. Transducers. Signal conditioners. Output and display systems. Statistics of measurement. Design project. Lecture and laboratory. Laboratory fee of \$10 to help defray cost of consumable items. Prerequisite: Engineering 345.

468-3 Digital Signal Processing. Discrete systems. Z-transforms, discrete Fourier transform. Fast Fourier transform algorithms. Digital filter design. Applications in speech and image processing. Prerequisite: 455.

477-4 Electromagnetic Fields II and Microwaves. Application of Maxwell's equations and the laws of electromagnetics to boundary-value problems, microwave fundamentals; guiding and resonating structures, and surface waves. Poynting's theorem and microwave measurements. Lecture and laboratory. Prerequisite: 375.

478-3 Digital Communication. Principles, analysis, design, and applications of digital communication systems; transmission techniques of digital information; state-of-the-art implementation of modems, terrestrial line-of-sight, digital, microwave networks, and digital satellite communication systems. Prerequisite: 455 or consent of instructor.

486-3 Electric Energy Sources. Principles and utilization of nuclear, solar, and fossil-fuel generators. Direct energy converters including thermionic, thermoelectric, and photovoltaic. Prerequisite: Engineering 385 or consent of instructor.

487-4 Power Systems Analysis I. 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 concept. Prerequisite: Engineering 385.

488-3 Power Systems Engineering. Economic operation of power systems; symmetrical components; short circuit analysis; stability. 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 experimental courses in electrical engineering. Prerequisite: consent of instructor.

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.

536-3 Network Synthesis. Introduction to modern network synthesis. Driving point and transfer functions. Positive real function Foster networks, and Cauer networks. Active network elements. Synthesis using active elements. Prerequisite: 445 or 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. Thermoelectric phenomena. Magnetic materials. Quantum electronics and lasers. Prerequisite: consent of instructor.

548-3 Advanced Electronic Devices. 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 Engineering 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; consent of instructor.

551-3 Probability and Random Processes. Event and probability. Random variables and sequences. Stochastic processes. Frequency domain analysis, Wiener filters. Dynamical systems. Recursive filtering. Kalman filters. Nonlinear and stochastic differential systems. Likelihood ratio. Hypothesis testing and signal detection. Prerequisite: 458 and Mathematics 483 or consent of instructor.

552-3 Statistical Theory of Communication. Elementary detection and estimation theory. Hypothesis testing. Sequential testing. Application to digital communication problems; detection, synchronization. Prerequisite: 551.

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.

56-3 Modern Control Theory. Introduction to topics in modern control theory. State variables. Concepts of controllability and observability. Stability theory. Nonlinear control. Sampled-data control theory. Signal-modulated systems. Optimal control. Prerequisite: 456 or consent of instructor.

57-6 (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.

62-3 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.

77-3 Antenna Theory and Design. The application of Maxwell's equations to radiating structures. Theory and design of antennas. Prerequisite: 477, or consent of instructor.

80-1 to 4 Seminar. Collective and individual study of selected issues and problems relating to various engineering areas.

86-3 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: 87.

92-1 to 3 Special Investigations in Electrical Engineering. Individual advanced projects and problems selected by student or instructor. Prerequisite: graduate standing and consent of instructor.

93-1 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.

99-1 to 6 Thesis.

01-1 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. Graded S/U or DEF only.

ENGINEERING MECHANICS

The following courses are offered by the Dept. of Civil Engineering and Mechanics.

14-3 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 incompressible flows. Isentropic flow of a perfect gas. Normal and oblique shock waves, Prandtl-Meyer flow. Prerequisite: Engineering 313 or equivalent.

441-3 Vibration in the Design of Machines and Structures. Theory: review of second order ordinary linear differential equations. Matrices and determinants. Phasor and trigonometric solutions, Duhamel integrals, Fourier Series. Applications: motor and equipment mounts, deflection of rotating shafts, resonance, dynamic balancing, vibration absorbers, vibrometer and accelerometer design, analysis of accelerometer and vibrometer data, seismic loads on buildings, vehicle suspensions, vibration of geared systems, vibration linkages. Prerequisite: Engineering 222, 260b, 311, and Mathematics 305.

446-3 Materials Engineering. A macroscopic overview of the behavior of engineering materials including metals and composite materials. Topics covered include the elastic behavior of materials; failure theories and plastic behavior; brittle fracture and fatigue, impact loadings, thermal stresses, and creep. Prerequisite: 222, 312.

447-3 Intermediate Mechanics of Materials and Structures. An introduction to the equations of elasticity. Applications of these equations to beam bending, torsion, and plane stress/plane strain problems. Energy methods. Introduction to elastic-plastic material behavior. Prerequisite: Engineering 222, 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; Moiré 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. Principles 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 Civil Engineering 451.) An 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: 351 or equivalent.

458-2 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.

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.

483-3 Engineering Design. Provides the senior engineering student with a design experience involving two or more of the following disciplines: solid mechanics, fluid mechanics, dynamics/vibrations, and materials. The course is directed towards the development of attitudes and approaches to the design process rather than specific design techniques. Students working in small teams will select a problem, define and design the system components into a final design, and document the design effort. Not to be taken for graduate credit. Prerequisite: graduating senior standing.

492-1 to 4 Special Problems in Engineering. Selected engineering topics or problems in (a) stress analysis, (b) flow analysis, (c) structural engineering, (d) computational mechanics, (e) materials engineering and (f) dynamics. Four hours maximum course credit. Prerequisite: consent of instructor.

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: EMM 414 and EMM 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 free-streamline 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 sur-

face 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 equation; 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; use in the solution of two- and three-dimensional stress problems; plate bending and shell problems; introduction to dynamic nonlinear analysis, applications to fluid mechanics. Prerequisite: 462 or consent of instructor.

540-2 Elastic Stability. Bending of beams and columns under simultaneous action of axial and lateral loads; buckling of compression bars, frames, rings, and arches; lateral buckling of beams; torsion of I beams; buckling of thin plates. Prerequisite: Mathematics 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 method; linear and non-linear behavior; theory of bending of anisotropic and non-homogeneous plates. Prerequisite: Mathematics 305 or 407 or consent of instructor.

550-3 Advanced Compressible 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 multi-degree-of-freedom framed structures. Structural idealization. Matrix formulation. Lagrange's equations. Response calculation. Mode-superposition and direct integrative 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 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have

Completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. 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 of turbo-machinery. Prerequisite: Engineering 300.

401-1 Thermal Measurements Laboratory. Study of basic physical measurements used in the thermal sciences. Calibration techniques for temperature sensors. Transient and steady-state error analysis. Thermal and transport property measurements. Prerequisite: Engineering 302.

402-3 Heat Exchange Equipment Design. Two phase flow and heat transfer. Design of heat exchangers: liquid-liquid/gas-liquid/gas-gas, moist air heating and cooling coils, evaporators and condensers, heat pipes. Prerequisite: Engineering 222, 300, 302, and 313.

403-1 Mechanical Engineering Measurements 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, vibrometers, oscilloscopes, strain gages and load out equipment, analog/digital converters, pressure transducers, radioactive particle tracers, and polariscopes and related equipment. Prerequisite: Engineering 311, 413, 335.

404-4 Optimization of Process Systems. The simulation and optimization of industrial process systems based on the principles of thermodynamics, heat transfer, mass transfer, and fluid mechanics. The analysis and correlation of experimental engineering data, and the use of the correlated data in process simulations. The mathematical modeling of the performance of energy transfer and environmental treatment equipment (pumps, turbines, mass and heat exchangers, etc.) from analytical predictions and experimental results. The application of the principal optimization methods encountered in engineering

practice. Computer applications. 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: 301.

406-3 Thermal Systems Design. Application of the principles of engineering analysis to the design of thermal systems. Consideration of such systems as refrigerators, building air conditioning systems, spacecraft control systems, solar heating systems, and gas liquefying systems. Prerequisite: Engineering 300, 302.

408-3 Energy Conversion Systems. Principles of advanced energy conversion systems; nuclear, fossil fuel, and combined cycle power plants and magnetohydrodynamics, cogeneration of electricity and process steam, heat pump. Constraints on design and use of energy conversion systems; energy resources, environmental effects, and economics. Prerequisite: Engr 300.

416-3 Air Pollution Control. Engineering control theory, procedures, equipment, and economics related to particulate and gaseous emissions control. The environmental impact of controlling emissions. Sampling and analysis procedures. Laboratory work includes design, construction, and use of a source sampling system. Safety glasses are required. Concurrent enrollment in 418 is recommended for students in thermal and environmental engineering option. Prerequisite: 314.

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.

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 Mass Transfer Processes. Mass transfer principles and processes. The rate mechanisms of molecular, convective, and interphase mass diffusion. Simultaneous heat and mass transfer. The process design of industrial mass transport operations such as absorption, humidification, water-cooling, drying, distillation, and adsorption. Prerequisite: Engr 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 Solar Heating Design—Residential Systems. 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 and senior standing in engineering.

443-4 Engineering Design. Projects of an engineering systems design nature. For a specific project, define and design the various subsystems, define subsystem interface requirements, integrate the subsystems into the final design, and document and design effort. Laboratory. Not for graduate credit. Prerequisite: senior standing in engineering.

444-3 Solar Energy Design—Commercial and Industrial Systems. Energy auditing and energy conservation techniques for commercial and industrial buildings. Active solar heating and cooling systems. Computer simulation models. Economic evaluation. Industrial process heating systems. Prerequisite: Engineering 300, 302, 313.

464-2 Physical Metallurgy and Ceramics. Structure/composition determination for bulk and surfaces. Thermodynamics of solutions. Phase transformations. Structure and properties of aggregate and composition materials. Corrosion. Dislocation theory. Plastic flow. Fracture. Failure analysis. Prerequisite: Engineering 222, 312.

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: homogenization, crystallization, precipitation. Powder preparation, sintering, and densification. Deformation processing: rolling, forging, extrusion, drawing, preferred orientation. Prerequisite: 464.

470-3 Simulation and Control of Machines. Dynamic simulation and control of machines. Balancing. Response of machine components and combinations to periodic and non-periodic loading. Suspension systems, Laplace transform, transfer functions, open and closed control loops. Response of basic control systems. Prerequisite: Engr 260b and Math 305.

472-3 Materials Selection for Design. Interaction of design parameters and materials selection parameters; comparison of alternative materials, thermomechanical processing, selection of materials, and processing and fabrication to meet the requirements of a design in the student's area of specialization. Prerequisite: 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, Engr 222, 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.

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: Engineering 300.

501-3 Transport Phenomena. Mechanisms 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 balance simultaneous mass, and heat transfer. Prerequisite: Engineering 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: Engineering 302.

503-3 Convective Heat Transfer. Laminar and turbulent convective heat transfer over surfaces and inside tubes. Heat transfer in developing flows. Heat transfer at high velocities. Influence of temperature-dependent properties. Prerequisite: Engineering 302.

504-3 X-Ray Diffraction and the Solid State. (Same as Physics 571.) X-ray diffraction by atoms, molecules and crystals, Fourier transforms, convolution, electron density, and Patterson functions. Single crystal method. Temperature diffuse scattering; determination of elastic constants, dispersion effects and vibration spectra. X-ray scattering by noncrystalline forms of matter. X-ray powder methods; determination of precise lattice constants, thermal expansion, strain, quantitative analysis of mixtures. X-ray studies of order-disorder. Diffraction by imperfect crystals. Applications to atomic diffusion measurements. Prerequisite: 464 or consent of instructor.

505-3 Physical Properties of Crystalline Materials. Thermal expansion, compressibility, and magnetic and electrical properties in relation to crystal structure. Influence of temperature. Piezoelectricity and pyromagnetism. Ferroelectricity and ferroelectrics. Antiferroelectrics. Ferromagnetic crystals, antiferromagnetics. Domain structures. Phase transitions, ionic polarizabilities. Influence of temperature. Influence of structure in crystal optics. Molecular refractivity. Structural theory

of optical activity. Elasticity and crystal structure. Piezoelectricity. Plastic deformation. Slip. Creep. Cleavage. Prerequisite: 464.

06-3 Solidification Processing. Heat flow during 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.

07-3 Combustion Phenomena. Basic combustion phenomena-chemical rate processes-flame temperature, burning velocity, ignition energy, quenching distance, and flammability limits-laminar and turbulent flame propagation-aerodynamics of flame-gaseous detonations-two phase combustion phenomena-fluidized bed combustion. Prerequisite: Engineering 300.

09-3 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 and non diffuse, non gray surfaces. Radiation in the presence of other energy transfer modes. Approximate and computer solution techniques. Prerequisite: Engr 302.

10-3 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.

20-3 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.

25-3 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.

31-4 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.

32-3 Separation Processes and Equilibrium Operations. Phase equilibrium, mul-

tistage 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.

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 chairperson.

599-1 to 6 Thesis. Six hours maximum course credit.

601-1 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. Graded S/U or DEF only.

Engineering Technology

There is no graduate program offered through engineering technology. 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.

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, opto-electronic devices, thyristors, unijunction transistors, and amorphous semiconductors. 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.

404-3 Machine Design Technology. Strength and safety considerations in design of machine parts. Fatigue and stress concentrations, bearings, brakes, clutches, and springs. Applications of the principles of mechanics to problems of design and development, mechanisms. Not for graduate credit. Prerequisite: 260a, 311.

408-3 Computer Assisted Drawing and Design. Theory and practice of computer graphics as applied to computer assisted design. Use of programming and commercial programs to assist in mechanical engineering technology design projects. Not for graduate credit. Prerequisite: 103, 404, Engr 222, and senior standing.

415-4 Elementary Structural Design. Introduction to structural properties of steel and reinforced concrete. Design of basic steel elements: tension members, beams, columns, and connections. Basic design of reinforced concrete elements: beams, columns, and footings. Use of AISC and ACI codes. Prerequisite: 311 (or concurrent enrollment), 315, 202.

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, Engr 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 power plant. Prerequisite: 318, 424a.

426-4(2,2) Photogrammetry. (a) Cameras and photography; flight planning; mathematical

principles of vertical and tilted aerial photography; 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 System 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 digital 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 transforms. 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 or concurrent enrollment.

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.

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.

12-3 English Non-Dramatic Literature: the Renaissance.

13-3 English Non-Dramatic Literature: the Restoration and Earlier Eighteenth century.

14-3 English Non-Dramatic Literature: the Later Eighteenth Century.

21-3 English Romantic Literature.

22-3 Victorian Poetry. Victorian poets: Tennyson, Browning, Arnold, and other poets in England.

23-3 Modern British Poetry.

25-3 Modern Continental Poetry. Representative poems by major 20th century poets of France, Italy, Germany, Spain, Russia, and Greece.

26-3 American Poetry to 1900. Trends in American poetry to 1900 with a critical analysis of the achievement of the more important poets.

27-3 American Poetry from 1900 to the Present. The more important poets since 1900.

36-3 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.

38-3 Intellectual Backgrounds of American Literature. The relationship of basic ideas in America to American literature.

45-3 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.

51-3 Eighteenth Century English Fiction. Defoe through Jane Austen.

52-3 Nineteenth Century English Fiction. Victorian novel: 1830-1880.

53-3 Modern British Fiction.

55-3 Modern Continental Fiction. Selected major works of European authors such as Mann, Silone, Camus, Kafka, Malraux, Lesse.

58-3 American Fiction to the Twentieth Century. The novel in America from its beginnings to the early 20th Century.

59-3 American Fiction of the 20th Century. Trends and techniques in the American novel and short story since 1914.

60-3 Elizabethan and Jacobean Drama. Elizabethan drama excluding Shakespeare: such Elizabethan playwrights as Green, Peele, Kyd, Marlowe, Heywood, Dekker; and Jacobean drama: such Jacobean and Caroline playwrights as Jonson, Webster, Marston, Middleton, Beaumont and Fletcher, Massinger, Ford, Shirley.

62-3 English Restoration and 18th Century Drama. After 1660, representative types of plays from Dryden to Sheridan.

64-3 Modern British Drama.

65-3 Modern Continental Drama. The continental drama of Europe since 1870; representative plays of Scandinavia, Russia, Germany, France, Italy, Spain, and Portugal.

68-3 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.

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: GE-D 101 and 117, 118 or 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: GE-D 117, 118, or 119, or equivalent.

492-3 to 9 Creative Writing: Senior Writing Project. 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 senior project requirement. An alternative may be an internship in a publishing firm if appropriate arrangements can be made by the department. Prerequisite: consent of instructor.

493-3 to 9 (3 per topic) Special Topics in Literature and Language. Topics vary and are announced in advanced; 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 \$10.00 screening fee is required.

495-3 Literary Criticism. Includes both history of criticism and modern criticism. Open only to seniors and graduate students.

496-3 to 6 (3,3) Topics in Women's Literature. (Same as Women's Studies 452.) 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.

497-3 to 9 (3 per topic) Senior Honors Seminar. Topics vary yearly. May be repeated as the topic varies. Prerequisite: departmental approval and undergraduate status.

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; English 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.

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.

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.

600-1 to 36 (1 to 16 per semester) Dissertation.

601-1 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. Graded *S/U* or *DEF* only.

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.

475A-12 to 34 Full Year Abroad in Austria. Two semesters at the Pädagogische Akademie at Baden and at various institutions of higher learning in Vienna. All courses are taught in German. Students may obtain 30 to 34 semester hours of credit in German language, literature, and civilization and with prior approval in elective areas of study including music, art, architecture, history, anthropology, political science, physical education, and sociology. Not for graduate credit. Prerequisite: 5 semesters of college German or equivalent with 3.0 grade point average.

495-3 to 6 Internship. Provides structure within which previous studies can be given practical application normally in a foreign setting. Placement is arranged through the department, while supervision is provided at the internship site. Prerequisite: junior standing and prior approval by the department.

Each approval requires attainment of an accepted level of language competency.

06-1 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 on-thesis programs.

07-1 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 on-thesis programs.

08-1 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 on-thesis programs.

09-1 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 on-thesis programs.

35-2 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.

36-2 Bibliography and Research Techniques—French. 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.

37-2 Bibliography and Research Techniques—German. 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.

38-2 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.

39-3 Bibliography and Research Techniques—Spanish. 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.

40-3 The Linguistic Structure of Chi-

nese. (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.

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 in 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 requirement for foreign languages as research tool. Prerequisite: 388 or one year of Latin or equivalent.

496-2 to 8 (2 to 4, 2 to 4) Independent Study in Classics Program. (Same as Anthropology 376, History 396, Philosophy 496, Religious Studies 496.) Normally taken in course of junior and senior years to a total of at least four hours under a professor participating in classics program (anthropology, classics, history, philosophy, or religious studies). At end of advanced level work, student will submit a research paper. Not for graduate credit. No knowledge of Greek or Latin is required. Prerequisite: consent of instructor and classics section head.

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 French 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 Individualized Language Study. Treatment of problems concerning grammar, idioms, vocabulary, and other language skills in units tailored to the particular needs of the individual advanced level students enrolled in the course. Exercises in writing, understanding, and speaking will be offered with emphasis placed on the active use of the language which the student may need in present or future activities or careers.

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: 320 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: 320 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* and 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 La Fayette, 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: 320 or equivalent, may be taken independently of 335.

438-3 Business French II. A continuation of 435 but may be taken independently. Translations of business documents, oral and written presentations of news items on business in France, and commercial correspondence. Detailed study of transportation of goods, conditions, and documents of sales, payments, imports and exports, banking, French companies, insurance, and taxes. Prerequisite: 320 or equivalent.

440-3 Literature of the Enlightenment. Study and discussion of the novel, theater, and philosophic writings 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.

470-3 Backgrounds of French Civilization

0-1 to 3 Literature of the 17th Century. Collaborative research in selected works of neo-classical French authors. Lectures, reports, discussions, paper.

0-1 to 3 Literature of the 18th Century. Selected topics, movements, or authors in the literature of the 18th Century.

0-1 to 3 Literature of the 19th Century. Selected topics, movements, or authors in the literature of the 19th Century.

0-1 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 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. Graded *S/U* or *DEF* only.

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 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. Graded *S/U* or *DEF* only.

German

Courses numbered 388 and 488 are 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. Students will not receive graduate credit for courses numbered below 400.

388-3 German as a Research Tool. Intensive study of German 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 the course instructor.

401-3 Early German Literature. Survey of medieval culture and literature. Reading of selections and discussion of major works of the Middle Ages in their esthetic and historical contexts. Conducted in German. Offered in alternate years only. Prerequisite: 330 or 380.

412-3 Linguistic Structure of Modern German. 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.

413-3 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. Conducted in English.

416-3 Individualized Language Study. Designed to improve language skills beyond the level of 320. Treatment of problems concerning grammar, idioms, vocabulary, and other language skills tailored to the particular needs of advanced students. Emphasis is placed on the active use of the language which the student may need in present or future activities or careers. Prerequisite: 320b or equivalent.

435-3 Business German. An overview of West German business, presented through lectures, readings, and discussions. Coursework with textbooks 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.

445-3 Age of Goethe. Intensive and extensive study of the authors, works, and movements of the period spanned by Goethe's life (1749-1832). Lectures, reports. Conducted in German. Prerequisite: 330 or consent of instructor.

460-3 East and West of the Wall. Literature of the two Germanies. Course will trace the beginnings and the establishment of the two German literatures after World War II. Conducted in German. Prerequisite: 330 or 380.

465-3 German Theater Today. Plays performed in German-speaking countries at the present. The role of the theater in German culture. Conducted in German. Prerequisite: 330 or equivalent.

485-2 German Lyric Poetry. Development of German lyric poetry from Klopstock and Burger to the present. Conducted in German. Prerequisite: 330 or equivalent.

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 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 German, or equivalent.

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.

501-2 to 4 (2, 2) Seminar in Literature, Culture, or Folklore. Intensive study of a selected topic in German literature, culture, or folklore. Revolving subject matter; may be repeated once, for a total of four semester hours.

502-2 to 4 (2, 2) Seminar in Germanic Linguistics. Intensive study of a selected topic in historical or descriptive Germanic linguistics. Revolving subject matter; may be re-

peated once, for a total of four semester hours. Prerequisite: 413 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.

512-2 Historical Germanic Dialects. Gothic or Old High German; grammar, etymology, introduction to methods of historical linguistics, and careful reading of representative texts. Prerequisite: 413 or consent of instructor.

536-1 Teaching German at the College Level.

560-3 German Literature at the Turn of the 20th Century. The convergence and revival of different literary movements and traditions during the heyday of German Imperialism. Taught in German.

561-3 Modern German Novel. German novel in the 19th and 20th centuries. Conducted in German.

586-3 Das Komische. *Das Komische* in different periods of German literature and culture. Conducted in German.

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 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. 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.

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 style 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 Socialist 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 foreign languages as a research tool. Prerequisite: 388 or one year of Russian or equivalent.

490-1 to 3 Independent Study. Directed independent study in a selected area. Prerequisite: consent of the Russian section head.

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 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. 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 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.

412-3 Advanced Grammar and Composition. 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.

415-3 The Linguistic Structure of Spanish. Theory and practice in Spanish pronunciation and study of Spanish grammatical structure, in contrast to English, with application to teaching.

417-3 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 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.

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 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis research hours, usually three to six hours, before being eligible to register for this course. 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. 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 or education, or consent of instructor.

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 regime, evapotranspiration, surface and subsurface runoff, and the quantity and timing of water yield. Spring semester odd years. Prerequisite: Mathematics 140.

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-economics principles to forest timber and non-timber production; capital theory; benefit-cost analysis; and economics of conservation. Prerequisite: 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 per 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 problems, marketing or-

ganization, 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 or 422T.

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. 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.

429-4 Wildland Watershed Analyses. A lecture/laboratory course designed to provide a practical knowledge of the equipment, procedures, and tests used in determining the quality and quantity of waters flowing within and out of wildlands. Prerequisite: Chemistry 140a.

430-3 Wildland Watershed Management. Emphasis is placed upon 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 silviculture 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. Prerequisite: 351 or consent of instructor.

452-2 Forest Soils. Characterization and fundamental concepts of forest soils and their relationship 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. Spring semester even years. Prerequisite: Plant and Soil Science 240 and concurrent enrollment in Forestry 452L.

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. Spring semester even years. Prerequisite: Plant and Soil Science 240 and concurrent registration in Forestry 452.

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 of environmental quality are presented. Case studies culminating in the preparation of environmental impact statements are emphasized. Field trip 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 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 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.

490A-2 Resources Management Consortium. Intensive field course in resources management decision-making. Student serves as team member in solving resource problems in forestry, wildlife management, recreation, and interpretation at Land Between the Lakes. Enrollment is limited to six. Student must have consent of the instructor. Course taught at Land Between the Lakes. Cost of room and board not to exceed \$100.00. Not for graduate credit.

492-1 to 4 Special Studies for Honor Students. Research and individual problems in forestry. Not for graduate credit. Prerequisite: consent of chairperson and 3.0 minimum grade point average.

494-1 to 6 Practicum. Supervised practicum experience 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 conclusion 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 year. Prerequisite: 411 or equivalent or consent of instructor.

512-2 Tree Selection and Breeding. Qualitative methods of describing variation patterns of trees, testing genetic and environmental effects and interactions, and evaluations of tree improvement program. Prerequisite: 411 or consent of instructor.

516-2 Advanced Forest Management. Case studies in forest land 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 year. Prerequisite: 421 or consent of instructor.

521-2 Recreation Behavior in Wildland Environments. Review of sociological and psychological theories relevant to outdoor recreation planning; management alternatives. Review of current behavior research in outdoor recreation. Application of behavior concepts to recreation planning and administration. Offered alternate years.

530-2 Forest Site Evaluation. A discussion of the factors affecting site quality and the 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, Biology 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

ty are emphasized during laboratory period. Cost: approximately \$15. Offered alternate years. Prerequisite: 331 or equivalent.

388-1 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.

390-1 to 4 Readings in Forest Resources. Intensive consideration is given to current practices and problems in forestry. Prerequisite: consent of instructor.

393-1 to 4 Individual Research. Directed research in selected fields of forestry.

399-1 to 6 Thesis. Minimum of five hours to be counted toward a master's degree.

401-1 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. 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 facilities 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, cluster 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 Management of Spatial Data Bases. This course will teach students to use specialized computer programs for the collection, storage, analysis, and mapping of spatial data. A simplified methodology makes the techniques available to students with no previous computer experience. Prerequisite: 310, 304, 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, 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 multidisciplinary 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 170,000 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. (Cross-listed with 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 per-

ception 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 system analysis and modelling environment 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 variability. 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. Charges 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 microclimate especially evapotranspiration, are compared and evaluated. Consequences of alternative land uses on climate and hydrology are considered regionally. Charges 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.

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: GE-A 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: 330 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.

470-6 to 9 (3, 1 or 2, 2 to 4) Urban Planning. (a) Planning concepts and methods (Same as Political Science 447a.) Charges not to exceed \$8 for field trips. (b) Field problem (Same as Political Science 447b.) (c) Planning and public administration internship (for undergraduate credit only). Prerequisite: 326 or 421 or consent of department.

471-3 Regional Planning. A study of the viewpoints, methodology, and experiences of various types of regional planning in the United States; some attention given to state and national scale planning. Prerequisite: 300 or consent.

487-6 (1, 2, 3) Honors in Geography. (a) Honors tutorial; (b) honors reading; (c) honors supervised research. Must be spread over the last two years of the undergraduate's career. May be taken in either a, b, c or b, a, c sequence. Prerequisite: 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.

20-2 to 4 Seminar in Physical Systems valuation. Prerequisite: graduate standing.

21-2 to 4 Seminar in Resource Planning. Prerequisite: graduate standing.

22-4 Seminar in Economics in Geography and Planning II. (Same as Economics 25.) 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.

24-2 to 4 Seminar in Social Geography. Prerequisite: graduate standing.

27-2 to 4 Seminar in Urban and Regional Planning. Prerequisite: graduate standing.

70-2 to 4 Planning Internship. Planning internship with city or regional planning agency or private planning firm. Prerequisite: 70a or consent of department.

91-2 to 4 Independent Studies in Geography. Prerequisite: graduate standing.

93A-2 to 24 (2 to 6 per semester) Research in Physical Geography. Prerequisite: 520.

93B-2 to 24 (2 to 6 per semester) Research in Economic Geography. Prerequisite: 521.

93C-2 to 24 (2 to 6 per semester) Research in Urban and Regional Planning. Prerequisite: graduate standing.

93D-2 to 24 (2 to 6 per semester) Research in Social Geography. Prerequisite: 524.

96-2 to 4 Field Course. Prerequisite: graduate standing.

99-2 to 6 Thesis. Prerequisite: graduate standing.

00-1 to 32 (1 to 16 per semester) Dissertation. Prerequisite: graduate standing.

01-1 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. 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 in Geology. An introduction to quantitative methods in a geological and earth sciences context. Topics introduced include sampling plans for geological studies, non-parametric tests 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 Botany 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, 204b, 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 occurrence 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.

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 Paleocology and Environments of Deposition. Characteristics, distribution, and classification of recent and ancient environments. Criteria for recognizing ancient

environments. Sedimentological and paleogeological 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 America 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 geological 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. 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 costs approximately \$120, 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 me-

chanics. One term paper and a field trip required. Prerequisite: 220 or consent.

460-3 Geological Data Processing. Computer applications to geological problems including the processing and programming data and the interpretation and evaluation 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 introductions to dislocations, deformation history, and microfabric analysis. Hypotheses of orogenesis are discussed and evaluated. Lecture and assigned problem 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 erosion 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. Lab exercises deal with techniques for assessing environmental hazards (i.e., slope hazards, soil descriptions, flood frequency, and surface water hydrology). Prerequisite: 220 and 474 or consent of instructor.

480-3 Geology of Coal. Geology as related to exploration, development, and mining of coal; stratigraphy sedimentation and structure of coal deposits; types 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.

482-3 Coal Petrology. Structural features and microscopy of coal seams. Origin and al-

eration of coal constituents. Includes field trips, study of coal specimens, and techniques. Prerequisite: 220 and 221 or consent of instructor.

84-3 Palynology. (Same as Botany 484.) Taxonomy, morphology, stratigraphic distribution, and ecology of fossil pollen, spores, and associated microfossils. Prerequisite: 220, 221, or consent of instructor.

00-1 to 2 Teaching for Geology Graduate Students. To help teaching assistants develop skills in conducting laboratory work and leading discussions. One hour required or all teaching assistants in geology. Graded *W/U* only.

10-2 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 374.

13-2 Advanced Geologic Data Analysis. Probabilistic and statistical methods utilized in the analysis of geologic data. Examples taken from all areas of geology. Emphasis, however, on sedimentary and stratigraphic data analysis. Prerequisite: 460 or consent of instructor.

15-3 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.

16-3 Industrial Rocks and Minerals. Geologic settings, origin and uses of rocks and minerals used by industry for purposes other than sources of metals. Lecture, laboratory, and field trips. Prerequisite: 315.

17-2 to 9 (2 to 3 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.

18-3 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.

20-2 to 9 (2 to 3 per semester) Advanced Topics in Igneous and Metamorphic Petrology. Petrologic principles and their relationships and other selected topics to be announced by the department. Prerequisite: consent of instructor.

22-3 Sedimentary Petrology—Siliciclastics. The petrography and petrology of siliciclastic rocks, emphasizing sandstones. Microscopic studies of composition and compo-

nents of detrital clastic rocks, their origin, provenance, characteristics, diagenesis, cementation, and lithification. Prerequisite: 325 or 415 or consent; 520 or 521 recommended.

23-3 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.

24-2 to 9 (2 to 3 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.

25-2 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.

26-3 Advanced Topics in Applied Paleocology. Lectures, field, and laboratory studies, including techniques and quantitative methods. Preparation for research in paleocology. Emphasis on using fossil marine invertebrates and trace fossils to interpret ancient sedimentary environments. Prerequisite: 428 or consent.

27-3 Micropaleontology. Structure, classification, paleocology, 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.

33-1 to 9 (1 to 3 per semester) Advanced Topics in Geophysics. Specialized topics in geophysics. Examples include but are not limited to seismic stratigraphy, mid-continent seismicity, isostasy, 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.

36-3 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, Mathematics 150, or consent of instructor.

37-3 Applied Seismology. Study of the seismic reflection techniques, including theory and methods of collection and analysis of se-

ismic reflection data, the seismic method, waveform analysis, and digital filtering with computer applications and seismic instrument characteristics. Prerequisite: Mathematics 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, Mathematics 150, or consent of instructor.

542-2 (1, 1) Seminar in Geology. Seminars in advanced topics in geology. Prerequisite: graduate standing.

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 3 per semester) Advanced Topics in Surficial 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 materi-

als, coalification, constitution, and classification of peats, lignites, bituminous coal, and thurcite; 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 Dissertation. Research for and writing of the doctoral dissertation. Prerequisite: consent of instructor.

601-1 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. 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.

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 materials.

410-3 Human Sexuality. Provides detailed in-depth information of 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.

411-3 Emergency Medical Technician in the Wilderness. Placement of trained emergency medical technicians into a wilderness situation and have them adopt previously learned skills and newly developed skills. Required to help purchase supplies as indicated in class. Prerequisite: 310 or 434.

430-3 Health and Injury Control in a Work Setting. (Same as IT 430.) Assesses the health and injury control programs present in a work setting. Emphasis is 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 and emergency care procedures are needed. American National Red Cross and American Heart Association Certification can be obtained. Students may be required to purchase materials not to exceed \$15. Prerequisite: consent of instructor.

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 consumers in the current health marketplace. Major categories of topics include health products, health services, and sources of health information of particular interest to 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 programs. Prerequisite: 442S or consent of instructor.

445-2 to 6 (2 to 3, 2 to 3) Contemporary Specialized Laboratory Techniques. Provides teachers and other highway safety personnel with instructional experience in (a) motorcycle safety, (b) emergency, evasive, and pursuit driving. Prerequisite: 302 or consent of instructor. Maximum of 6 semester hours may be obtained either graduate or undergraduate.

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 Designs. Analysis of existing health education curricula with emphasis on student development of instructional designs and modules. Students will prepare, utilize, and critique materials. Prerequisite for student teaching in health education. Prerequisite: 305.

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 methods 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 vari-

ous 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, dietitians, 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 tak-

en 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.

72-3 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 education programs at all levels from preschool through junior colleges. Cooperative relationships among teaching, administrative, and supervisory personnel with community groups will be stressed.

90-8 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.

92-8 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.

97-2 (1, 1) Seminar in Health Education. Advanced graduate students discuss individual health projects and present research problems. Each will present a dissertation prospectus.

98-3 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.

99-1 to 6 Thesis.

00-1 to 32 (1 to 16 per semester) Dissertation.

01-1 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. Graded *S/U* or *DEF* only.

History

13-3 European Rural Society, 400 to 1000 A.D. Monks, priests, peasants, barons, and kings: an historical sociology of the ecclesiastical and feudal regimes which replaced classical civilization after the fall of the Roman Empire in the West.

14-3 European Urban Society, 1000 to 1500 A.D. Merchants, bankers, craftsmen, lawyers, and bureaucrats: a sociological and economic analysis of the origins and development of early modern European urban institutions.

417-4 Cultural History of the Middle Ages. Selected problems in the development of mediaeval culture, the mediaeval universities, and the transmission of ancient ideas to the modern world.

418-3 Renaissance. The focus is 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 of 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) World War I to World War II; (b) World War II and after. Problems in the political, social, and military history of Europe in the 20th Century.

430-3 The British Empire-Commonwealth. The rise of the British Empire and its subsequent development into a commonwealth of self-governing nations.

432-4 History of France. Social, economic, political, and intellectual evolution from mediaeval 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.

435-3 History of Modern Italy. Italy in the 19th and 20th centuries. Emphasis is on continuing problems: the tensions between agricultural south and industrial north, Italy's role as a Great Power, and the persistence of centrifugal forces in Italian politics.

436-6 (3, 3) History of Spain. (a) To 1700; (b) Since 1700. Institutional, intellectual, so-

cio-economic, and political history 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.

450-4 American Colonial History. The discovery, settlement, and development of the colonies before the American Revolution.

451-3 Jeffersonian and Jacksonian America, 1789-1850. Origin and development of democratic institutions and the emergence of sectional conflict in the pre-Civil War era.

452-6 (3, 3) United States History 1850-1896. (a) Civil War era; (b) the origins of modern America; reconstruction and nationalization: 1885-1896. The study of the background to the Civil War, the Civil War, Reconstruction, and the Gilded Age.

453-6 (3,3) Twentieth Century American History. (a) 1896-1921; (b) 1921-1945. The history of the United States since the 1890s with emphasis upon politics, political ideas, and diplomacy.

460-6 (3, 3) Social and Intellectual History of the United States. (a) To 1860; (b) since 1860. The development of American society and a study of the various types of economic, social, and political thought that have influenced it.

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 1914; (b) since 1914. General consideration of American foreign policy and the emergence of the United States as a 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.

470-3 Colonial Latin America: Policies and Practices. Theory and operation of the Spanish and Portuguese colonial systems in the New World.

471-6 (3,3) History of Mexico. (a) 19th Cen-

tury; (b) Revolutionary Mexico. Significant political, economic, diplomatic, social, and cultural aspects of Mexican life from independence to the present time with emphasis upon the Mexican revolutions.

472-3 The Caribbean Area. A history of the Caribbean from Columbus to Castro.

473-3 Argentina and Chile. A narrative and comparative history of these two leading Latin American nations with emphasis on the period since independence.

474-3 Andean South America. The political, economic, social, and cultural development of the Andean nations from Precolumbian times to the present.

476-3 Dictatorships in Latin America. A political, economic, social, and military study of the domestic and international aspects of dictatorship.

480-6 (3, 3) History of Chinese Civilization. (a) Traditional China. (b) Modern China. The first semester provides a full coverage of traditional China with 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.

485-3 History of the Middle East. A study of the Middle East from the 7th through the 16th centuries concentrating on the following major themes: the development of Islamic civilization, the mediaeval Muslim world, the disintegration of the Arab caliphate, the rise of the Ottoman Turks, and the development of the Ottoman Empire.

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 Toynbee.

492-4 Historical Research and Writing. Methods of historical investigation, criticism, and composition. Open not only to history majors but with permission of instructor to those in other disciplines interested in history as a research tool.

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.

495-4 History Honors. Principles of historical method, research, and writing for senior honor students only. Not for graduate credit. Prerequisite: consent of department.

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.

97-3 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.

98-3 Problems of the History Museum. Examines the general background and function of the museum in its contemporary 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.

15-3 to 6 (3, 3) Studies in Mediaeval and Renaissance History. A study of the major historical literature on the Middle Ages and Renaissance.

16-4 to 8 (4, 4) Seminar in Mediaeval and Renaissance History. A research course concerning selected topics in Middle Ages and the Renaissance.

20-3 to 6 (3, 3) Studies in Early Modern European History. A study of the major historical literature in early modern European history.

21-4 to 8 (4, 4) Seminar in Early Modern European History. A research course concerning selected topics in early modern European history.

22-3 to 6 (3, 3) Studies in Modern European History. A study of the major historical literature in modern European history.

23-4 to 8 (4, 4) Seminar in Modern European History. A research course concerning selected topics in modern European history.

30-4 Seminar in English History. A research course concerning selected topics in English history.

50-4 Seminar in American Colonial History. A content and research course concerning specific areas of American Colonial history.

51-4 The Age of Jefferson. A content and research course on the rise and development of Jeffersonian Democracy, 1790-1824, with emphasis upon social, economic, and political programs of Republicans and Federalists; the clash of mercantile and agrarian interests.

52-4 Reform Movements in the Pre-Civil War Period. A content and research course concerning major political, economic, and social issues, 1825-1850, which divided the United States and prepared the way for civil war.

53-4 Seminar in Twentieth Century United States History. A content and research course on American political history and behavior since 1896.

54-4 New Viewpoints in American History. New interpretations and recent developments in American history.

555-4 to 8 (4, 4) Seminar in American History. A content and research course in American history. Topics will vary with the instructor.

561-4 Seminar in American Constitutional History. A content and research course concerning specific areas of American Constitutional history.

566-4 Seminar in American Frontier History. A content and research course concerning selected topics in American frontier history. Prerequisite: 466a, b, or permission of instructor.

567-4 Seminar in Illinois History. A content and research course concerning selected topics in Illinois history.

570-4 to 8 (4, 4) Seminar in Latin American History. A content and research course concerning selected studies in Latin American history.

580-4 Seminar in Modern China. A content and research course concerning selected topics in modern Chinese history.

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 Seminar in Contemporary History. A research course concerning selected topics in contemporary history.

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 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. Graded *S/U* or *DEF* only.

Industrial Technology

There is no graduate degree program offered through industrial technology. 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: 309, 310.

430-3 Health and Injury Control in a Work Setting. (Same as Health Education 430.) Assesses the health and injury control in a work setting. Emphasis is 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 for solution which simulate existing conditions in industry. Students present their solutions to the class and to the instructor in a formal manner. Prerequisite: 358, 365, 375, 382, or consent of instructor.

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.

450-3 Industrial Systems Analysis. Teaches the systems required for successful industrial operations. The role of the computer in system design and application is emphasized.

455-3 Industrial Robotics. 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: 340.

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.

465-4 Industrial Safety. Principles of industrial accident prevention; accident statistics and costs; appraising safety performance; recognizing industrial hazards and recommending safeguards. Includes a study of the Occupational Safety and Health Act and the Coal Mine Health and Safety Act. Prerequisite: senior standing.

466-3 Occupational Safety and Health Standards. Covers the standards, inspection procedures, and compliance requirements covered in the latest revisions of the Occupa-

tional Safety and Health Act of 1970. Emphasis is placed on developing the student's ability to detect violations of the standards and recommend corrective safety actions.

492-1 to 6 Special Problems in Industry. Special opportunity for students to obtain assistance and guidance in the investigation and solution of selected industrial problems. Not for graduate credit. Prerequisite: consent of instructor.

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.

405-3 Introduction to Mass Communication Research. Overview of communication research methods including practical training in interpretation and presentation of social science data. Introduction to survey research methods, experimental design, and use of computers for analysis of data. Presentation of data in journalistic forms and social science reports. Not for graduate credit. Prerequisite: 309, or 310, or consent of instructor.

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.

413-3 Picture Editing. Introduction to the need for and function of picture editors for newspapers and magazines. Practical experience in picture selection, cropping, sizing, caption writing, and layout design. Legal and ethical considerations. Assignment procedures for photographers and other illustrators. Library systems for negatives, prints, and other illustrations. Prerequisite: senior standing.

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.

450-3 Mass Media Management. Basic economic and management theory and application of theory to the management process in the mass media. Individual projects involving analysis of management of a selected medium. Prerequisite: consent of instructor.

451-3 Current Media Problems. Readings and weekly seminar discussions on the role of the journalist in seeking solutions to the prob-

blems facing the mass media in the last third of the Twentieth Century. Involves questions of economics, structure, ethics, effects.

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 for the media and for 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. 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 Educational Psychology 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 developments 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 inter-

relationship 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 Dissertation.

601-1 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. Graded *S/U* or *DEF* only.

Linguistics

The Department of Linguistics offers courses toward the Master of Arts degree in 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. May be taken singly.

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, and 430 or consent of department.

410-10 (5, 5) Intermediate Uncommon Languages. Review of the structure of modern spoken language. Introduction to written language. Emphasis on conversational style. The first semester carries undergraduate credit only. (g-h) Vietnamese. Prerequisite: 210 or equivalent.

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.)

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.

420-8 (4, 4) Advanced Uncommon Languages. Advanced conversation and reading of third-year level materials in preparation for classes conducted in the language. (g-h) Vietnamese. Prerequisite: 410 or equivalent.

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 process 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.) Topics include 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.

453-4 Methods in Teaching English as a Second Language. Introduces the basic methods of teaching English as a second language, specifically as part of bilingual programs, and presents the theoretical premises and background from the fields of general linguistics, contrastive linguistics, psycholinguistics, education, and sociolinguistics. Prerequisite: undergraduate status.

454-2 Observation and Practice in TESL. Lessons in teaching English as a second language are modeled and demonstrated live and via video-tape. In addition to microteaching and other peer-teaching, students observe ESL/EFL classes and laboratories and do tutoring and practice teaching under supervision as schedulable. Enrollment limited to undergraduates. Prerequisite: 453 or concurrent enrollment or consent of department. Mandatory Pass/Fail.

455-2 Materials in TESL. Examination and criticism of currently used textbooks in ESL and bilingual education programs, as well as other printed materials and visual and mechanical aids in teaching English as a second language. Prerequisite: 453 or consent of department.

456-3 Contrastive and Error Analysis. Examination of the interference of other languages into the English of ESL learners on the levels of phonetics, phonology, morphology, syntax, lexicon, semantics, and orthography. Study of written and spoken errors, diagnosis of errors and development of techniques for correction. Prerequisite: 453 or consent of department.

489-1 Seminar in Developmental Psycho-Neurolinguistics. (Same as CDS 489 and Psyc 489.) Seminar will explore 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 interpreted to mean life-span. Prerequisite: consent of instructor.

497-1 to 8 Readings in Linguistics. Directed readings in selected topics. Prerequisite: consent of department and undergraduate status.

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 Language. (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.

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.

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 Educational Psychology 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 dif-

ferent 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.

581-2 Practicum in EFL/ESL: Oral English. Class observation and supervised practice teaching in English as a foreign language; meets concurrently with Linguistics 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 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 Linguistics 101, 102, and 103 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 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. Graded S/U or DEF only.

Mathematics

400-3 History of Mathematics. An introduction to the development of major mathematical 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 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 Methods in Applied Mathematics. The discrete and continuous model for the vibrating string; separation of variables and eigenfunction analysis; elementary structure of inner product spaces; the spectral theorem for finite dimensional Hermitian operators and applications; the Courant-Fisher max-min characterization and applications; the spectral theorem for compact Hermitian operators and applications to Fredholm integral equations and Sturm-Liouville differential operators. 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 and 305.

409-3 Fourier Transforms and Applications. Techniques for finding FT's; convolution; linear time invariant systems; Dirac functionals; Lighthill's theory of generalized functions; FT's of periodic, discrete, and finite functions; duality; filtering; the sampling theorem; the central limit theorem; FT solution of the heat and wave equations; Poisson's formula; de Boor's algorithm for computing the FFT. Prerequisite: 305 and 221 or 306.

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.

419-4 Algebraic Structures I. Groups, subgroups, normal subgroups and homomorphism theorems, permutation groups, finite direct products, finite abelian groups, p -groups and Sylow's theorem, normal and subnormal series, Jordan-Holder theorem. Rings and subrings, divisibility theory in integral domain, polynomial rings. Prerequisite: 319 or consent of department.

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.

426-3 Introduction to Mathematical Logic. General introduction to the method of mathematical logic, forming of denials, the statement calculus including the deduction and completeness (with respect to truth tables) theorems, and the predicate calculus including the deduction theorem, deduction techniques; (in the predicate calculus) normal forms and equality, first order theories, first order number theory, consistency, truth (in the model-theoretic sense), completeness theorem with respect to the model-theoretic definition of validity), independence, categoricity, decidability, and a brief introduction to Godel's theorem. Prerequisite: 301, 319, 352, or Philosophy 320.

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 \mathbb{R}^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.

437-3 Elementary Algebraic Topology. Homotopic maps. Homotopic paths. Fundamental group. Covering spaces. Homotopy lifting property. Manifolds. Classification of surfaces. Polyhedra. Prerequisite: 319 and 433.

447-3 Introduction to Graph Theory. 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, weak and strong connectivity in digraphs, existence of directed paths and cycles in tournaments, flows in networks, and Ford-Fulkerson Theorem. Prerequisite: 221 and one of 319 (or Computer Science 315) or Engineering 335.

449-3 Introduction to Combinatorics. (Same as CS 449.) An introduction to combinatorial mathematics with computing applications. Topics include permutations and combinations, generating functions, recursion, inclusion and exclusion, coding theory, block design. Prerequisite: 319, or CS 315, or consent of department.

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.

451-3 Introduction to the Theory of Computing. (See Computer Science 451.)

452-3 Introduction to Analysis. A rigorous development of one-variable calculus concepts including the real numbers, sets, limits of sequence, continuity of functions, differentiation, Riemann-Stieltjes integration, series of functions. 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, and residue theorem, conformal mapping, asymptotic expansions. 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 instructor.

458-3 Statistical Methods in Business. Descriptive statistics, probability distributions, statistical estimation and hypothesis testing with business applications, chi-square tests, linear regression, analysis of variance, index numbers, interpretation of computer output. Prerequisite: 457 or Business Administration 451 or equivalent and graduate standing in the College of Business and Administration.

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 model. Development of the simplex method. Application of the model to various problems. Introduction to duality theory. Transportation and network flow 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 for classes of failure distributions. Prerequisite: 480 or 483.

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. Must be taken in a, b sequence. Prerequisite: 221, 250, Computer Science 202.

480-4 Introduction to Probability. A comprehensive introduction to probability theory at a level suited to most upper-division undergraduates and first-year graduate students. Topics include sample space, events, probability measure, combinatorics, conditional probability, independence, random variables, probability distributions, expectations, moments, moments generating functions, functions of random variables, multivariate distributions, law of large numbers, central limit theorem. Prerequisite: 251.

481-3 Elements of Stochastic Processes. An introduction, including normal, Poisson, and Markov processes. Prerequisite: 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 non-central 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: 221, 483, or consent of instructor.

487-3 Nonparametric Methods in Statis-

tics. A discussion of confidence intervals and tests of hypotheses where no functional form is postulated for the population. Prerequisite: 483 or 480.

489-3 Sample Survey Methods. Introduction to methods for sampling human populations, wildlife populations, and spatial distributions, and associated methods of data analysis. Emphasis will be given to criteria for choosing the appropriate sampling design and to the avoidance of nonsampling error. Prerequisite: 483 or consent of instructor.

495-1 to 6 Special Topics in Mathematics. Individual study or small group discussions of 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; real numbers; Lebesgue measure; measurable functions; integration; convergence theorems; functions of bounded variation; absolute continuous functions; L_p spaces; general measure spaces; radon-Nikodym theorem; product measures and Fubini's theorem. Prerequisite: 452.

502-3 Modern Analysis. Banach space; 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 9 Advanced Topics in Ordinary Differential Equations. Topics chosen from: stability; oscillations; functional differential equations; perturbations; limit points and limit circle; boundary value problems in other areas in ordinary differential equations as the instructor desires. Prerequisite: 505 or 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 Neuman functions. Classification of linear and quasilinear PDE's. Theory of characteristics. The Cauchy-Kowalowski theorem. The maximum 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.

510-3 Mathematical Logic. Review of elementary logic; incompleteness and undecid-

completeness results of Gödel, Church, and Tarski; consistency of arithmetic. Prerequisite: 426.

11-3 Modern Approaches to Teaching Secondary School Mathematics. (Same as Curriculum, Instruction, and Media 529.) Topics include problem-solving application of mathematics and the teaching of proofs in secondary school mathematics. Practical classroom use of materials will be emphasized. Credit is not applicable to a graduate program in mathematics. Prerequisite: consent of instructor.

16-8 (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.

20-3 Algebraic Structures. 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: 419.

22-3 to 9 per topic (3, 3, 3) Advanced Topics in Algebra. (a) Ring theory: primitive polynomials, radicals, completely reducible rings, Artinian and Noetherian rings, projective and injective modules, complete ring of quotients, classical ring of quotients, Faith-Utumi theorem. (b) Commutative algebra: ideal theory of Noetherian rings, valuations, localizations, complete local rings, Dedekind domain. (c) Group theory: selected topics from one or more of the following: p -groups, solvable groups, simple groups. (d) Group representations: semisimplicity of the group algebra, characters, one-dimensional representations, orthogonality relations induced characters, induced representations, Brauer's theorem. (e) Homological algebra: projective and injective modules, homological dimension, derived functors, spectral sequences of a composite functor, applications. (f) Lie algebras: theory of Nilpotent and solvable Lie algebras including Lie's and Engel's theorems; E. Cartan's classification of complex simple Lie algebras. Prerequisite: 520.

25-3 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: consent of instructor.

26-3 to 9 per topic (3, 3, 3) Advanced Topics in Number Theory. (a) Analytic number theory. (b) Algebraic number theory. (c) Additive number theory. (d) Diophantine approximations. (e) Dirichlet series and au-

tomorphic forms. Prerequisite: consent of instructor.

528-3 Formal Languages and Automata. (See Computer Science 553.) Prerequisite: 451.

529-3 Theory of Computability. (See Computer Science 555.) Prerequisite: 451.

530-3 General Topology. Topological spaces, continuous functions, product topology, convergence, separation and countability, compactness, connectedness, local properties, metrizable, compact-open topology. Prerequisite: 433 or 437, 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.

532-3 to 9 per topic (3, 3, 3) Advanced Topics in Topology. (a) General topology: topics chosen from topological groups, categorical topology, topological dynamics, uniform spaces, and others. (b) Algebraic topology: topics chosen from homotopy theory, homology, and cohomology, fiber bundles, sheaf theory, and others. Prerequisite: consent of instructor.

536-3 Differential Geometry. Basic manifold theory, linear connections, Riemannian geometry, DeRham cohomology, applications. Prerequisite: 421, 433 or 435 or 530.

537-3 to 9 per topic (3, 3, 3) Advanced Topics in the Topology and Geometry of Manifolds. (a) Differential topology: topics chosen from Sard's Theorem, mod 2 and Brouwer degree. Index theory, Cobordism theory, Morse theory, Exotic Spheres, Poincaré duality and others. (b) Differential geometry: topics chosen from Hodge theory, complex manifolds, Riemannian geometry, connections on fiber bundles, Lie groups and others. (c) Topological manifolds; orientation of manifolds; cup and cap products; Poincaré duality; Alexander duality; Lefschetz duality.

550-1 to 6 per topic (1 to 3 per semester) Seminar. Supervised study and preparation of reports on assigned topics. Reports presented for class discussion. (a) Algebra. (b) Geometry. (c) Analysis. (d) Probability and statistics. (e) Mathematics education. (g) Topology. (h) Applied mathematics. (i) Differential equations. (j) Number theory. (k) Master of Science seminar. Prerequisite: consent of instructor.

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.

552-3 to 9 per topic (3, 3, 3) Special Topics in Analysis. (a) Harmonic analysis. (b) Approximation theory. (c) Advanced complex variables. Prerequisite: consent of instructor.

553-3 to 9 (3, 3, 3) Special Topics in Functional Analysis. (a) Topological vector spaces. (b) Operator theory. (c) Banach algebras. (d) Integration theory. (e) Distribution theory. (f) Abstract harmonic analysis. 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; Rouché's theorem. Prerequisite: 452.

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.

567-6 (3, 3) Econometrics I and II. (Same as Economics 567.) (a) Linear regression analysis as applied to single equation economic models. Problems of least squares, maximum likelihood, and Bayesian estimation techniques in stochastic economic models. (b) Elements of asymptotic distribution theory and estimation techniques in multiple equation economic models. Take in a, b, sequence except with consent of instructor. Prerequisite: 417 or 421 and 483 or 514.

569-1 to 9 Advanced Topics in Applied Mathematics. Selected topics chosen from such areas as continuum mechanics, electromagnetic theory, control theory, mathematical physics. Prerequisite: consent of instructor.

570-3 to 9 per topic (3, 3, 3) Topics in Operations Research. (Same as Computer Science 570.) (a) Netflows. Builds on network and generalized network models for the transportation, transshipment, assignment, shortest path, maximal flow. Prerequisite: 472 or Computer Science 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: 480 or 483 and Computer Science 470. (c) Large scale linear programming. Advanced L.P. techniques for sparse matrices and inversion routines. Prerequisite: 472 or Computer Science 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 Computer Science 472.

572-3 to 9 per topic (3, 3, 3) Advanced

Numerical Analysis. (Same as Computer Science 564.) Selected topics chosen from such areas of numerical analysis 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.

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 squares 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 or 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 both 483 and 452.

581-3 Probability. General probability spaces, review of measure and integration product spaces, product measures, Fubini 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).

582-3 to 6 per topic (3, 3) Advanced Topics in Probability and Statistics. (a) Probability. Additional topics in probability theory which can include one or more of the following: the Law of the Iterated Logarithm; arcsine law; the ergodic theorem; problems in random walk and discrete Markov chains; Martingales; Brownian motion. In some cases a considerable proportion of time can be devoted to the General Central Limit Problem-Infinite Divisible Distributions. (b) Statistics. Topics presented will depend upon the needs of advanced students in statistics and the interests of the instructor. Generally, there will be presentation of background material in statistics, decision theory. Topics can include: multiple decision procedures; sequential analysis; advanced multivariate theory; nonparametric theory; order statistics. Prerequisite: 581 f (a) and 580 for (b).

584-3 Advanced Linear Models and Experimental Design. A thorough discussion of the practice of experimental design and the theory of linear models. Basic design principles and advanced design concepts. General linear model, estimable functions, generalized inverses, robust estimation, analysis of residuals. Prerequisite: 484 and 580 or consent of instructor.

85-1 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 489 and consent of instructor.

88-3 Multivariate Statistical Analysis. Rigorous introduction to the theory and methods of multivariate statistics. The course will cover such topics as sampling from a multivariate normal distribution, multivariate analysis of variance, discriminant analysis, canonical correlations, and principal components. Prerequisite: 580.

92-2 to 6 (2, 2, 2 per topic or 3, 3 per topic) 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.

95-1 to 12 per topic Special Project. An individual project, including a written report. (a) In algebra; (b) in geometry; (c) in analysis; (d) in probability and statistics; (e) in mathematics education; (f) in logic and foundations; (g) in topology; (h) in applied mathematics; (i) in differential equations; (j) in number theory. Graded S/U only. Prerequisite: consent of instructor.

99-1 to 6 Thesis. Minimum of three hours to be counted toward the Master of Arts degree.

00-1 to 30 Dissertation. Minimum of 24 hours to be earned for the Doctor of Philosophy degree.

01-1 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. Graded S/U or DEF only.

Medical Education Preparation

A graduate degree program is offered through medical education preparation. Four hundred-level courses may be taken for graduate credit only with written permission of the relevant department and the graduate dean.

00-1 to 6 (1 per semester) Medprep Seminar. Seminar on social, professional, and scientific issues of interest to students planning a career in medicine or dentistry. Topics: (a) orientation; (b) medical/dental seminar. Required of medprep participants. May be taken for graduate credit only with written permission of the relevant department and the graduate dean. Prerequisite: restricted to medprep students. Must be taken in a, b sequence. Mandatory Pass/Fail.

01-1 to 20 (1 to 2 per area) Medprep Ba-

sic Skills. Focus on skills critical for academic success in preprofessional and professional training. Areas: (a) learning skills; (b) science process skills; (c) quantitative skills; (d) perceptual motor skills; (e) interpersonal skills; (f) reading skills; (g) written communication skills; (h) vocabulary skills; (i) speed reading; (j) other. All areas required or proficiency demonstrated with the first year in program. Not for graduate credit. Prerequisite: restricted to medprep students. Areas c, d, e, f, g, and i are Mandatory Pass/Fail.

402-1 to 12 (1 to 2 per topic) Medprep Special Problems. Seminars, workshops, lectures, and field experiences related to preparing the student for medical/dental school and careers in medicine or dentistry. Topics: (a) MCAT/DAT orientation; (b) research seminar; (c) clinical experience; (d) independent research; (e) independent readings; (f) other. Topic (b) required of all medprep participants. May be taken for graduate credit only with written permission of the relevant department and graduate dean. Prerequisite: restricted to medprep students. Topic (c) Mandatory Pass/Fail.

403-1 to 15 (1 to 2, 1 to 2, 1 to 2, 1 to 2, 1 to 2, 1 to 3) Medprep Biology Tutorial. Depending on individual need content will be remedial, supplementary to concurrent biological science courses, or additional permitting acceleration. Sections will be (a) genetics; (b) anatomy, (c) physiology, (d) embryology, (e) microbiology, (f) zoology, (g) special. May be taken for graduate credit only with written permission of the relevant department and the graduate dean. Prerequisite: restricted to medprep students or consent of instructor.

404-1 to 14 (1 to 2, 1 to 2, 1 to 2, 1 to 2, 1 to 3, 1 to 3,) Medprep Chemistry Tutorial. Depending on individual need content will be remedial; supplementary to concurrent preprofessional chemistry courses (Chemistry 222a, b; 334 and 346; and 450) or additional permitting acceleration. Sections will be (a, b) inorganic; (c, d) organic; (e) biochemistry; (f) other. May be taken for graduate credit only with written permission of the relevant department and the graduate dean. Prerequisite: restricted to medprep students.

405-1 to 4 (1 to 2, 1 to 2) Medprep Physics Tutorial. Depending on individual need content will be remedial, supplementary to concurrent preprofessional physics courses or additional permitting acceleration. Sections will correspond to two semester physics sequence. May be taken for graduate credit only with written permission of the relevant department and the graduate dean. Prerequisite: restricted to medprep students.

Microbiology

403-3 Medical Bacteriology Lecture. A survey of the mechanisms of infection, epidemiology, and immunity and the specific application of these principles to the symptomatology, diagnosis, treatment, and control of

the more common bacterial infections of humans. Three hours lecture. Fall semester. Prerequisite: 301.

404-2 Medical Bacteriology Laboratory. Procedures for the collection and handling of medical specimens for microbial examination and for cultivation and identification of the pathogenic organisms by their morphological, biochemical, and serological characteristics and the fundamental role of the bacteriologist in the diagnosis of infectious diseases. Four hours laboratory. Fall semester. Prerequisite: 403 or concurrent enrollment.

421-3 Foods and Industrial Microbiology Lecture. The relationships of microorganisms to the preparation and preservation of foods; their application to the industrial production of beverages, foods, antibiotics, and other commercial products. Consideration of sanitation, pollution, and recycling of waste products into useful materials. Pure food and drug regulations. Three hours lecture. Prerequisite: 301.

422-2 Foods and Industrial Microbiology Laboratory. Methods for preparation, preservation, sanitary inspection, and analyses of foods and industrial products. Four hours laboratory. Prerequisite: 421 or concurrent enrollment.

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.

453-3 Clinical Microbiology and Immunology Lecture. Lectures dealing with the fundamentals and clinical applications of microbiology and immunology and the properties, pathogenesis and control of bacterial, vi-

ral, and mycotic infections in people. Three hours lecture. No limit on enrollment. Prerequisite: 403, 441, and 451.

454-2 Clinical Microbiology and Immunology Laboratory. Methods and procedures in the clinical diagnosis of microbiological and immunologic diseases in people. Four hours laboratory. Enrollment limited to 12. Prerequisite: 404, 442, and 452, consent of instructor, and 453 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 Prokaryotic Diversity. A consideration of the major groups of prokaryotes with special emphasis on their comparative physiology and biochemistry. Prerequisite: 301 or equivalent and one year of organic chemistry.

471-2 Prokaryotic 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, one week. Prerequisite: 470 or concurrent enrollment.

490-1 to 3 Undergraduate Research Participation. Investigation of a problem either individually or as part of a research group under the direction of a member of the faculty. Not for graduate credit. Prerequisite: 3.0 grade point average in microbiology and consent of instructor.

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 a 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 7 Research. Prerequisite: consent of instructor.

520-2 Advanced Microbial Physiology

and Control Mechanisms. The physiology, biochemistry, and genetics of microbial regulatory mechanisms. Topics include transport phenomena, catabolite and nitrogen repression, the stringent response, and autoregulatory phenomena. Two lectures per week. Prerequisite: 425a and b, or Chemistry 451a and b, or permission.

528-1 to 3 Readings in Microbiology. Supervised readings for qualified graduate students. Prerequisite: consent of instructor.

540-3 Advanced Virology. Interactions between bacterial and animal viruses and their host cells; sequential synthesis of macromolecular components of viruses; synthesis of interferon; experimental carcinogenesis; genetic recombination among viruses. Three hours lecture. Offered in alternate years with 542. Prerequisite: 441.

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. Offered in alternate years with 540. 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.

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 12 Dissertation. Prerequisite: consent of instructor.

601-1 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and

who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. 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.

413-2 Mine Power Systems. Study of electrical, hydraulic, and pneumatic mine power systems. Selection and design of power systems and their components. Related economics and decision making criteria. Prerequisite: 410, and Engineering 385, or equivalent, or consent of instructor.

415-3 Surface Mining and Land Reclamation. Surface mining systems for coal and non-coal minerals. Development of mining operations, equipment selection, mine planning and design, land reclamation, erosion and sedimentation control. Prerequisite: 320, 400, and Geol 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. Two lectures and one laboratory per week. Prerequisite: 400 and Geol 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. Two lectures and one laboratory per week. Prerequisite: 410 and Engineering 313.

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, subsi-

dence, 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, Engineering 222, 361.

440-3 Design of Material Handling Systems. Study of material handling and waste disposal methods. Material handling systems selection. Systems design and development. Material handling economics. Prerequisite: 410 and concurrent enrollment in 415 or Engr 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.

460-3 Underground Mine Design Projects. Projects in planning and design of underground mining systems. Evaluate a potential mine site; select appropriate mining method; define and design mine 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: 450 or concurrent enrollment.

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 method; 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, 420, 431, 440.

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. Two lectures and one laboratory per week. 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 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 cycles 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 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. 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.

00-1 to 36 (1 to 16 per semester) Dissertation. Hours and credit to be arranged by the advisor. Prerequisite: admission to advanced study in molecular science.

01-1 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. Graded *S/U* or *DEF* only.

Music

Courses in this department may require the purchase of music literature and other incidental supplies.

00-1 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.

07-2 Modal Counterpoint. Study of Renaissance contrapuntal techniques. Extensive writing practice, and analysis of stylistic models. Prerequisite: 207.

04-1 to 8 (1 to 2 per semester) Collegium Musicum. For experienced singers and instrumentalists. Emphasis upon practical study of historical music literature of the Renaissance, and Baroque eras. Counts as a "major ensemble" for juniors and seniors.

00-1 to 2 (1, 1) Instrument Repair. A shop-laboratory course dealing with the selection, tuning, adjustment, maintenance, and repair of musical instruments.

1-2 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.

00-1 Jazz Arranging. Methods of scoring for popular groups. Practice in scoring arrangements and/or original compositions for jazz ensembles. Prerequisite: 324 or prior consent of instructor.

00-1, 2, or 4 Applied Music. Applied music for graduate credit is offered at the 400 and 500 levels in the areas listed below. May be repeated for credit as long as passing grade is maintained. Student must attend both the weekly studio class in addition to performance as scheduled on Fridays at 10 & am Student must concurrently enrolled in one of the performance groups. Prerequisite: for 440, 540: two semesters of *B* or better at previous level, or consent of applied jury. Music majors and minors enroll for two credits on their principal instrument, taking one half-hour private lesson and studio class, Mondays at 10:00. Those without prior approval by their applied jury for specialization in performance enroll for

four credits taking two half-hour private lessons and the studio class each week. Non-music majors or minors, and those music majors taking a second instrument, enroll for one credit, taking one private or class lesson per week. Six hours of individual practice per week required for each lesson. For shorter terms, credit is reduced or lesson time is increased proportionately.

- | | | |
|--------------|----------------|----------------|
| a. Flute | i. Baritone | q. Piano |
| b. Oboe | j. Tuba | r. Organ |
| c. Clarinet | k. Percussion | s. Harpsichord |
| d. Bassoon | l. Violin | t. Guitar |
| e. Saxophone | m. Viola | u. Recorder |
| f. Horn | n. Cello | v. Coaching |
| g. Trumpet | o. String Bass | |
| h. Trombone | p. Voice | |

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 GE-A 361 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. Designed 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. Designed for experienced teachers and advanced students.

456-4 (2, 2) Music for Exceptional Children. (Same as Special Education 456.) (a) Theories and techniques for therapeutic and recreational use of music with physically and mentally handicapped children. Includes keyboard, 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 musical 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: For undergraduate enrollment: 357 a or b. For non-music majors: prior consent of instructor.

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: For undergraduate enrollment: 357 a or b. For non-music majors: prior consent of instructor.

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: For undergraduate enrollment: 357 a or b. For non-music majors: prior consent of instructor.

479-2 to 4 (2 per topic) Solo Performance Literature. Topics presented will depend upon the needs of students and upon instructors scheduled. Areas: (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: 280-2 to 4 or consent of instructor..

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 hour's 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 of 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).

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). 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 offering. The student will select a member of the graduate faculty to guide and evaluate the work. 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. Approaches to historical and critical research and scholarly writing on music. 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 theories and techniques for evaluating and testing musical aptitude and achievement; investigation of acoustical perception; survey of current scientific research in music. A research project 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.

535-2 Contemporary Idioms. An analysis of major compositional techniques since 1945.

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.

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 major 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 Sallukis. (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.

68-1 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.

70-3 History of Opera. The development of the music, libretti, and staging of opera from the late Renaissance to the present, with detailed study of selected works. Prerequisite: for non-music majors: prior consent of instructor.

73-3 Medieval Music. Music of the medieval world; Gregorian chant; the Tropes; secular songs of the troubadours and trouvères; the use 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.

74-3 Renaissance Music. Burgundian and Netherlands music from 1450 and its spread; Isaac and Josquin; 16th Century polyphony in France, Germany, Spain, and England; the use of music for instruments and for solo voice. Prerequisite: for non-music majors: prior consent of instructor.

78-3 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.

80-2 to 4 (2, 2) Graduate Composition. Composition in the larger forms for solo and ensemble performance. Required of all master's candidates specializing in composition. Individual instruction. Prerequisite: 480-4 or prior consent of instructor.

85-2 Music Document. A written report representing the history and style of works performed in graduate recital, Music 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 Music 598 may be substituted, accompanied by a written analysis.

88-4 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 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.

89-2 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 ex-

planatory document. Prerequisite: 501 and prior approval of topic or proposal by thesis director and graduate committee in music.

601-1 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. Graded *S/U* or *DEF* only.

Occupational Education

(See vocational education studies)

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 topics in logical theory and/or formal logic not treated in 320. Prerequisite: 320.

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 relations of economics and social studies to political theory. Prerequisite: 340 or GE-C 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.) Survey of five different views of the relation of the concept of women to the philosophical concept of human nature.

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.

477-3 Latin American Philosophy. A survey of philosophic thought in Latin America from colonial times through 19th century positivism and the reactions against it, up to recent trends. Reading of original texts in Spanish and English translation. Discussions and reports.

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.

491-1 to 3 Undergraduate Directed Readings. Supervised readings for qualified students. Open to undergraduates only. Prerequisite: consent of instructor.

496-2 to 4 Independent Studies in Classics. (See Classics 496.)

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.

503-3 Philosophical Ideas in Literature. Metaphysical and ethical world views embodied in representative classics of poetry and prose from ancient to contemporary times.

515-3 Theory of Nature. Presuppositions of the Western view of nature, the need for revision of causal determinism, and the reintroduction of freedom into the spatiotemporal world.

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 Blaisdell 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.

591-1 to 16 Readings in Philosophy. Supervised readings for qualified students. Prerequisite: consent of instructor.

595-2 Teaching Philosophy. Study of the methods appropriate to teaching introductory courses at the college level in the various areas of philosophy.

599-2 to 6 Thesis. Minimum of four hours to be counted towards a master's degree.

600-3 to 32 (3 to 16 per semester) Dissertation.

601-1 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. 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.

402-2 Organization and Administration of Intramural and Extramural Activities. Planning intramural programs of sports. Planning and coordinating extramural activities commonly associated with physical education.

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.

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 identification, 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.

416-3 Current Theories and Practices in the Teaching of Dance. Designed to aid a critical evaluation and analysis of dance as an educational tool, from creative dance for children through dance in the University curriculum. Specific techniques, creative ideas, class organization, and general evaluation will be included. Notebook required. Prerequisite: four semesters of dance technique.

417-2 to 16 (2 semester hours per part) Concert Production Ensemble. Practical experience in concert production. (a) Performance, (b) choreography, (c) concert publicity, (d) costume design and construction, (e) set design and construction, (f) lighting design and technical execution, (g) sound production, (h) stage management and assistant directorship. Not for graduate credit. Prerequisite: 340a,b, 350a,b, or 379a,b, or equivalent and consent of instructor.

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.

444-2 to 6 Contemporary Dance Workshop. Dance technique and theory, composition, improvisation, and production. Advanced study of the problems of choreography and production in their presentation as theater. Public performance is required. Prerequisite: one year of technique and theory or equivalent.

450-1 to 4 (1, 1, 1, 1) Advanced Dance Technique—Classical Ballet. Continued study of advanced techniques in the classical ballet. Methodology, theory, and performance is stressed. Attendance at no more than two on-campus dance concerts per semester is required as made available. Not for graduate credit. Prerequisite: 350a, b or equivalent, senior standing, and consent of instructor.

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.

495-4 Senior Project in Dance. Work can be taken in one of three areas: (a) pedagogy, (b) performance, (c) choreography. Not for graduate credit. Prerequisite: senior standing and consent of instructor.

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.

501-3 Curriculum in Physical Education. Principles and procedures for curriculum construction and revision; criteria for selecting activities and judging outcomes and the place of the physical education course of study within the total curriculum.

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. In-depth 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 cinematograph 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 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.

519-3 Physical Education for the Educationally Handicapped Child. Application of research data and physical education principles and practices to the solving of learning difficulties of the mentally retarded, learning disabled, and emotionally impaired student. Emphasis placed on handicapped student needing specially designed instruction. Prerequisite: 403 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 problem 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.

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.

590-1 to 4 Readings in Physical Education. Supervised readings in selected subjects. Prerequisite: consent of adviser and department chairperson.

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 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. Graded *S/U* or *DEF* only.

Physics

410-3 Mechanics II. Lagrange's equations, mechanics of continuous media, inertia and stress tensors, rotation of rigid bodies, small vibrations, and advanced principles. 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. Advanced course in modern optics covering such topics as interference and interferometers, diffraction, coherence, holography, optics of solids, laser and non-linear optics; recent developments in optical instrumentation for research. Prerequisite: 328 and 420.

430-3 Quantum Mechanics I. An introduction to quantum mechanics including its experimental basis and application in atomic physics. Prerequisite: 310 and 320.

431-3 Atomic and Molecular Physics I. Atomic spectra and structure; molecular spectra and structure; application to lasers. Prerequisite: 205c, 430.

432-3 Nuclear Physics I. Basic nuclear properties and structure; radioactivity, nuclear excitation, reactions, nuclear forces; fission and nuclear reactors; controlled nuclear fusion. Prerequisite: 430.

445-3 Statistical Mechanics I. An introductory course in the principles and applications of classical and quantum statistical mechanics. Elementary kinetic theory of matter. Prerequisite: 340 and 430 or concurrent enrollment.

450-1 Modern Physics Laboratory. Introduces the student to experimental research and encourages the student to develop and carry out experiments. Prerequisite: 205c, either of 350 or 351, 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 technique with modern computer analysis. Prerequisite: 301 or Mathematics 305 or concurrent enrollment.

470-1 to 3 Special Projects. Each student chooses or is assigned to definite investigative project or topic. Prerequisite: 310, 320.

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: Mathematics 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: Mathematics 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 equilibrium 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 the Solid State. (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 to 12 per semester Continuing Re-

search. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis research hours, usually three to six hours, before being eligible to register for this course. 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 histological correlations. Three lectures per week. Should be taken in a sequence. Prerequisite: senior standing or consent of instructor.

401-6 (3, 3) Advanced Human Anatomy Laboratory. Laboratory dissection of the human body. Primarily for students with major in physiology or other biological sciences. Six hours of laboratory per week. Prerequisite: 400 to be taken concurrently.

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. Primary course for all students majoring in physiology or related sciences. Three lectures and two two-hour laboratory sessions 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.

420-4 Principles of Pharmacology. Absorption, distribution, and metabolism of drugs (pharmacokinetics). Action of drugs on the living organism. Covers pharmacologic action of drugs affecting autonomic nervous system, drugs used in neurological and psychiatric disorders, and drugs affecting the cardiovascular system. Three lectures and one three-hour laboratory per week. Prerequisite: 310 or concurrent enrollment in 410; organic chemistry. Some knowledge of biochemistry is desirable.

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 lecture hours 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 of prerequisites; 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.

461-3 Biomedical Electronics. Practical experience with modern electronic circuits and devices used for biomedical purposes, with circuit construction and troubleshooting practice. Two lectures and one two-hour laboratory per week. Prerequisite: consent of instructor.

462-3 Biomedical Instrumentation and Measurements. (Same as Electrical Engineering 462.) Diagnostic and therapeutic modalities related to engineering. Includes study of electrocardiography, ultrasonography, and chemical instrumentation; radiation therapy, electrosurgery, and prosthetic design. Prerequisite: senior standing in any branch of engineering and at least one course in human physiology or consent of instructor.

491-3 to 8 Independent Research for Honors. Supervised readings and laboratory research in physiology directed by a member of the physiology faculty. Undergraduate honors students only. By special arrangement with the instructor in the physiology department with whom the student wishes to work.

492-1 to 3 Special Problems in Physiology. Supervised readings and laboratory research in physiology directed by a member of the physiology faculty. Open to undergraduate students only. By special arrangement with the instructor with whom the student wishes to work.

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.

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: 430, Chemistry and Biochemistry 450 or their equivalents.

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 procedures 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. Prerequisites: physiology 440 or its equivalent.

551-4 Methods in Pharmacology. Basic and advanced laboratory methodology; in vivo and in vitro experimentation; interdisciplinary approaches (biochemical, electrophysiological, immunological, morphological, and toxicological techniques) in pharmacological research. Two hours of lecture and four hours of laboratory per week. Prerequisite: 550a, b, or concurrent enrollment, or consent of instructor.

555-3 Cardiovascular Pharmacology. A study of structure, biochemistry, electrophysiology, neurogenic and humoral regulation of the cardiovascular system in normal and diseased states. Three hours of lecture per week. Prerequisite 550a, b or equivalent or consent of course coordinator.

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; Mathematics 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.

572-2 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. 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 Biochemistry 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.

599-1 to 6 Thesis Research. Research for thesis for master's degree.

600-1 to 32 Dissertation Research. Research for dissertation for Ph.D. degree.

601-1 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. Graded *S/U* or *DEF* only.

Plant and Soil Science

Field trips are required for certain courses. The School of Agriculture offers courses in plant and soil science as part of a residence-center program at Western Illinois University.

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 lat-

est developments in their area of specialt. 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: Botany 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. Prerequisite: Botany 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 cost 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 costs 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 costs 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 trips cost 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 costs 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.

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 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 cost 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, Bot 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, Botany 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: Botany 320 or consent of instructor.

524-2 Advanced Plant Genetics. (See Botany 524.) Prerequisite: Biology 305 or equivalent.

526-4 Cytogenetics. (See Botany 526) Prerequisite: Biology 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. 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 chairperson. 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 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. 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: GE-B 212 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 relationship among national, state, and local government in the American federal system, with emphasis on recent literature and contemporary issues. Special attention given to fiscal relation and specific intergovernmental programs in areas such as housing and environmental quality are examined. Prerequisite: GE-B 212.

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 service in the cities of the U.S. Prerequisite: 213.

416-3 Senior Seminar in Politics. Seminars for advanced undergraduate students to examine in depth a wide variety of topics; to be taught by different instructors. Available for use as the honors seminar. Graduate students not admitted. Prerequisite: 200 recommended.

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.)

429-3 Women and the American Political Process. 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, will be concerned with the basic structure and power relationships in the American constitutional system and, in addition, will cover the 19th and early 20th century bulwarks of constitutional *laissez faire*, the contract clause and "substantive" due process. In brief, the course will cover judicial review, judicial restraint, separation of powers, the federal system, national powers, state powers, constitutional amendments, and restraints on economic powers, the contract clause and "substantive" due process. Prerequisite: GE-B 212. Political Science 330 is recommended. (b) This is the second course in the constitutional law sequence. The course will be wholly concerned with those provisions of the Constitution which protect individual rights and liberties against governmental encroachment. In brief, the course will cover constitutional provisions and case precedents relating to citizenship, freedom of speech, assembly, and association, freedom of religion, rights to persons accused of crime, protection against racial, ethnic, and other forms of discrimination, legislative apportionment and the electoral process. Prerequisite: GE-B 212.

33-3 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.

36-3 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: an ability to read court cases; 340 also preferred.

37-3 Jurisprudence (Theories of Law). Major schools in legal thinking. Positive law and natural law. Idea of justice and concept of natural rights.

41-3 Administration of Bureaucratic Organizations. A study of the elements of bureaucratic 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.

44-3 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: none; 213 recommended.

44-3 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.

44-5 Administration of Environmental Quality and Natural Resources. (Same as Geography 426.) 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 decisionmaking 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, and the Water Pollution Control Act and the Surface Mining Reclamation Act.

44-7 to 5 (3, 1 or 2) Urban Planning. (See Geography 470a, b.)

45-1-3 Ascriptive Politics: Gender, Race, Ethnicity. (Crosslisted as Black American Studies 445 and Women's Studies 447.) Comparative analysis of ascriptive factors in participation, organization, leadership recruitment and selection, stratification and mobility, policy formulation and implementation,

judicial decision-making, and political change.

45-2-3 The Politics of Developing Areas. A comparative study of the principal features of traditional, transitional, and modern political systems, patterns of social socialization and culture as well as leadership recruitment, and client-patron relationships in traditional and transitional political systems, the nature of political participating in predominately agrarian societies, and the strategies utilized to rule and to legitimize the rule of predominately post-colonial societies. Prerequisite: GE-B 250 recommended.

45-3 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.

45-7-3 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. GE-B 250 recommended.

45-8-3 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.

45-9-3 Government and Politics of the Soviet Union. Dynamics of Soviet government and economy. Prerequisite: none. GE-B 250 recommended.

46-1-3 Governments and Politics of Southeast Asia. Politics and governments of Burma, Thailand, Malaysia, Vietnam, Cambodia, Laos, Singapore, Indonesia, and the Philippines. Prerequisite: none. GE-B 250 recommended.

46-2-3 Government 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: none. GE-B 250 recommended.

46-3-3 Government and Politics of China. Internal political, economic, and social development of China. Prerequisite: none. GE-B 250 recommended.

46-4-3 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. GE-B 250 recommended.

46-5-3 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 Afri-

can states, continental and international organizations, and non-African states. Prerequisite: none. GE-B 250 recommended.

466-4 Governments 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 non-western states. Prerequisite: none. GE-B 250 recommended.

475-6 (3, 3) International Law. (a) Rules and practices governing the nations in their relations in peace and war. Prerequisite: none. GE-B 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. GE-B 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. GE-B 270 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. GE-B 270 recommended.

494-1 to 6 Honors Research. Directed research for senior government honors students. Not for graduate students. Prerequisite: consent of instructor and chairperson. Students must have at least a B average in political science.

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: Mathematics 516a or b or the equivalent. (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: Mathematics 516a or the equivalent. (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: Mathematics 516a or the equivalent. (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: Mathematics 516a and b or the equivalent. (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: Mathematics 516a and b or the equivalent.

502-3 to 6 Topical Seminar in Research Methods. Advanced seminar in empirical research methods. Topics will vary with instructor. Prerequisite: consent of instructor.

503-3 Data Preparation and Management. Covers the creation, dictating, cleaning, and management of data files using SPSS, SAS, OSIRIS, and the IMB OS/VS utility programs. Also treats the use of the IBM Job Control Language (JCL), the Conversational Monitor System (CMS), cataloged procedures, instream procs, and CMS EXEC's. A research tool course not to be counted toward graduate degree requirements. Prerequisite: Computer Science 202 or consent of instructor.

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 for 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 non-traditional approaches to the subject and will acquaint students with readings and analyses covering the scope of this sub-field. 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 atten-

tion 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 other hand. Issues in ethics and the public's expectations of professional administrators are also examined. Prerequisite: 340 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. 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. candidates.

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.

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.

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.

594-1 to 6 Research Report in Public Affairs. The student must conduct research and prepare a written report on some issue or problem in public administration. The project is to be completed under the supervision of the student's faculty committee. Prerequisite: consent of department. 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. 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.

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 16 per semester) Dissertation. Minimum of 24 hours to be earned for the Doctor of Philosophy degree.

601-1 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. Graded *S/U* or *DEF* only.

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.

14-3 Biology of Behavior Disorders. An examination of theory and research pertaining to the physiological basis of and therapies for a variety of psychological problems such as affective disorders, schizophrenia, alcohol and drug abuse, organic brain dysfunction, and aging. Prerequisite: 302.

15-4 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, GE-B 202.

16-3 Recovery of Function Following Brain Damage. A survey of the 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.

19-3 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 14, Biology 305, or equivalent is recommended.

21-3 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.

31-3 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.

32-3 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: 301, and 211 or Educational Psychology 422.

40-3 Theories of Personality. A review and evaluation of major personality theories and their supporting evidence. Prerequisite: 305 or consent of instructor.

41-3 Helping Skills in Clinical and Counseling Psychology. Provides systematic training in helping skills for students considering clinical or counseling psychology as a career. Students will 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.

461-3 Advanced Social Psychology. Critical examination of contemporary theories and research in social psychology. Practice in application of scientific findings to real life problems of individuals and groups. Issues treated in depth are chosen for relevance to students' personal needs and career interests. Not for psychology graduate students. Prerequisite: 307.

463-3 Attitudes and Persuasion. An examination of theory and research regarding the formation of attitudes, the modification of attitudes, and the techniques of measuring attitudes. Prerequisite: 307.

465-3 Need Assessment Techniques for Mental Health Planning. 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 the method of presenting results of need assessments to lay boards. Prerequisite: senior 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.

499-6 (3, 3) Senior Honors in Psychology. Intensive study of selective areas for students qualified for honors work in psychology. A research paper or equivalent will be required. Not for graduate credit. 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 Behav-

ior. 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: GE-A 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.

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, self-control, and "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, 537 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 Appraisal in Counseling. Emphasis is on the choice of assessment instruments and how they may be used in counseling. Attention is given to tests of ability, interests, values and personality and the syntheses of test and non-test information in the general practice of counseling. 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.

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. Review 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.

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; (j) child 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 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. 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.

430-2 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.

453-2 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: *C* in 300M and 300P, 308, and senior standing.

465-3 Advanced Television Production. Instruction and practical experience in the development of programming for television, resulting in completed segments for broadcast in individual and series production. Students will utilize the facilities of the Broadcasting Service and produce programming for WSIU-TV. For undergraduate students only. Prerequisite: 365 and consent of instructor.

467-3 Radio-Television in International and Agricultural Development. 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. Communication in development is explored. Research on effects on rural audiences. Open to non-majors with consent of instructor. Prerequisite: *C* in 300M and 300P and senior standing.

470-3 Television News Field Production. Advanced field reporting for television. Students will work under the supervision of the instructor to develop, investigate, and report news stories for television. This process will also study the development and production of the mini-documentary. Class will utilize 3/4-inch video recorders, cameras, and editing

systems. For undergraduate students only. Prerequisite: 370 or consent of instructor.

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: 325, 365, or consent of instructor and senior standing.

483-3 Advanced Radio-Television Writing. Exercises in writing broadcast manuscripts including documentary, drama, and children's programming. Prerequisite: 340, 383, or consent of instructor and senior standing.

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. Areas to 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 discussed, 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 non-commercial 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.

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 to 12 per semester Continuing Research. For those graduate students who have not finished their degree program and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this courses. 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 Sites. An examination of master plans for outdoor areas used in school and recreation programs. Principles of masterplanning and practical experience with the master plan will be correlated. Prerequisite: senior or graduate standing.

440-15 (3, 3, 3, 3, 3) Recreation Activities for Special 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 set-

tings: (a) Recreation for the mentally ill and emotionally disturbed. (b) Recreation for the mentally retarded. (c) Recreation for the aged. (d) Recreation for the socially deviate. (e) 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 environmental 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, systems 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. Study of concepts of leisure counseling as applied to special populations; leisure education models: facilitative techniques including gestalt awareness, transactional analysis, reality therapy, behavior modification, non-verbal communication, values classification, assertive training, rational emotive therapy, and relaxation therapy. Prerequisite: 303, one section of 440.

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.

475-1 to 24 (1 to 4 per topic) Recreation Workshop. Critical examination and analysis of innovative programs and practices in one of the following areas: (a) commercial, (b) group dynamics, (c) outdoor education, (d) outdoor recreation, (e) mentally retarded, (f) emotionally disturbed, (g) campus recreation services, (h) tourism, (i) aging, (j) prisons and detention centers, (k) physically handicapped, (l) budget and finance, (m) liability, (n) maintenance of areas and facilities, (o) personnel. Critical examination and analysis of innovative programs and practices in the maintenance of grounds and facilities. Maximum of six hours to count toward master's degree.

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.

490-1 to 12 Internship in Recreation. Supervised practicum experience in a professional recreation setting. Emphasis on administrative, supervisory, teaching, and program leadership in the student's area of specialization. For undergraduate credit only. Must be taken during student's senior year. Prerequisite: 16 hours of recreation and consent of instructor.

500-3 Principles of Recreation. Principles and interpretation of recreation and the basic concepts underlying the organization of leisure activities. Emphasis on cultural significance of recreation and the relationship of recreation to the totality of life. Required of all majors.

520-3 Park and Recreation Management. Basis for planning recreation programs and facilities. Administrative problems dealing with legislation, finance, and budget, public relations, office management and personnel are discussed in terms of effective professional management. Prerequisite: 500 or concurrent enrollment or consent of instructor.

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.

530-3 Programs in Recreation. Program planning, organization, and implementation of leisure programs in a variety of recreation settings and for a variety of population groups. Prerequisite: 500 or concurrent enrollment or consent of instructor.

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.

560-6 (2, 2, 2) Seminar in Recreation. Major issues, trends, and cultural, economic and social significance in (a) park and community, (b) special populations, 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.

570-3 Seminar in Recreation Management. An integrated seminar dealing with the problems involving park and community,

commercial, institutional, outdoor, church, school, and other recreation settings and populations. Current economic and social changes will be examined to determine their influence on the recreation profession. Required of all majors. Prerequisite: 520 and 530.

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 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. 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.

402-1 to 3 Human Development and Behavior. Examines theories and systems of human development, personal behavior patterns, and learning principles related conceptually to rehabilitation processes and practices. Prerequisite: consent of instructor.

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.

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 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. Two semester credits will ordinarily be granted for each unit. (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. Prerequisite: consent of instructor.

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 address 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. Prerequisite: consent of instructor.

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, 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 is on vari-

ous 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) Reading in Rehabilitation. Supervised readings in selected areas. Prerequisite: consent of instructor.

494-1 to 12 Work Experiences in Rehabilitation. Rehabilitation 494 and 594 both cannot be counted for graduate degree, only one of 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. Includes pertinent terminology and basic methodology of operant and respondent behavior, as well as laboratory experience in shaping new behaviors and in modifying established behaviors through a variety of operant procedures. Prerequisite: consent of department.

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

erebral 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.

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, the 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 systems 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 including 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, fis-

cal 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.

588-4 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: 596 or 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.

92-1 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.

93-1 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.

94-1 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.

95-1 to 12 Internship in Rehabilitation. Extended practice in rehabilitation settings cooperatively guided and supervised by agency staff and university faculty. Prerequisite: 94 and consent of department. Graded *S/U* only.

96-4 Research Design and Methodology in Rehabilitation. Manipulative and non-manipulative research methods, group and single subject designs, data analysis, and research evaluation pertinent to rehabilitation will be considered. Prerequisite: Educational Psychology 506 or consent of instructor.

99-1 to 6 Thesis. Prerequisite: consent of instructor.

00-1 to 30 Dissertation. Minimum of 24 hours to be earned for the Doctor of Rehabilitation degree. Prerequisite: doctoral candidate in rehabilitation.

01-1 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. Graded *S/U* or *DEF* only.

Religious Studies

There is no graduate program offered through religious studies.

Hundred-level courses in this unit may be taken for graduate credit unless otherwise indicated in the course description.

10F-3 Comparative Religion. (See Anthropology 410F.)

96-1 to 6 Honors Readings in Religion. Topics selected by student and instructor

which ordinarily are not covered in depth in regular course offerings. Not available for graduate credit. Prerequisite: consent of department.

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 Research Transmission Electron Microscopy. Lecture and laboratory to provide student with necessary theory and hands-on experience in transmission electron microscopy instrumentation (microscope and special preparation) to effectively carry out independent transmission electron microscopy research after this course utilizing the Center for Electron Microscopy equipment. Cost of supplies will exceed \$90 and a text is required. Two hours lecture, one hour audio visuals; six hours average laboratory per week, individually arranged. Prerequisite: specific approved research project requiring transmission electron microscopy and consent of instructor. Fall semester.

502-4 Research Scanning Electron Microscopy. Lecture and laboratory to provide student with necessary theory and hands-on experience in scanning electron microscopy instrumentation (microscope and specimen preparation) to effectively carry out independent scanning electron microscopy research project after course utilizing the Center for Electron Microscopy equipment. Cost of supplies will exceed \$90 and a text is required. Two hours lecture, one hour audio visuals; five hours average laboratory per week, individually arranged. Prerequisite: specific approved research project requiring scanning electron microscopy and consent of instructor. Spring semester.

503A-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-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.

504-3 Science for Primary School Teachers. In depth studies of selected basic concepts in general science for teachers of the primary elementary grades. Topics include diversity of life as revealed by animal and plant communities, state of matter, atomic theory, sun and

earth, and the atmosphere. Prerequisite: currently teaching in an elementary school.

Social Work

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.

430-3 Black Political Socialization. Definitive approach to how people learn about politics focusing on Blacks because of their unique experience; i.e., prolonged minority group status. Research oriented, in that, it takes an explanative and predictive approach to produce models of political learning. Not for graduate credit. Prerequisite: 230, junior or senior standing, or consent of instructor.

445-3 Ascriptive Politics: Gender, Race, Ethnicity. (See Political Science 451.) Not for graduate credit.

455-2 to 12 Rehabilitation Services with Special Populations.

465-3 Governments and Politics of Sub-Saharan Africa. (See Political Science 465.)

475-3 Sociological Effects on Black Education. A teacher-oriented course dealing with up-to-date research in Black and minority education. The instructor utilizes the findings of current periodicals to present models for understanding and communicating with Black children. Not for graduate credit. Prerequisite: Education 303 or consent of department.

480-4 to 8 (4, 4) Seminar in Black Studies. Analyses of the black experience directed toward practical contributions in the area studied. Topics vary with instructor. May be repeated once for a total of 8 credits provided registrations cover different topics. Topics announced in advance. Prerequisite: GE-B 109 or consent of department.

490-1 to 3 Cross-Cultural Rehabilitation. (See Rehabilitation 419.) Not for graduate credit.

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.

Social Work

Four-hundred-level courses may be taken for graduate credit unless otherwise indicated in the course description.

400A-3 Human Behavior and the Social Environment. A social systems approach to the study of typical human development and behavior. Examination of environmental forces impinging on the individual and implications for social work practice. Not for graduate credit for social work majors.

400B-3 Human Behavior and the Social Environment. A continuation of 400A. A social systems approach to the study of diverse dysfunctional human development and behavior. Not for graduate credit for social work majors. Prerequisite: 400A.

401-4 Social Work Practice: Individual and Families. An examination of problem solving interventions and environmental modifications skills for use with individual and families. Prerequisite: 375, 383, 400A, and 400B or concurrent enrollment.

402-3 Social Work Practice: Small Groups. Examines social work group process with clinical and non-clinical groups. Leadership, roles, goal setting, and interventive strategies are addressed. Not for graduate credit. Prerequisite: 375, 383, 400A, 401, and 400B or concurrent enrollment.

403-3 Social Work Practices: 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. Prerequisite: 375, 383, 400A, 400B, 401, 402.

411-3 Methods of Social Research. Examines the principles, concepts, and methods of scientific investigation in terms of its application to social work research and practice. Not for graduate credit. Prerequisite: concurrent enrollment in either 401, 402, or 403; GE-D 11 or equivalent.

421-3 Social Welfare Policy. This course provides an indepth examination of social welfare structure, functions, policy, and programs, as well as strategies for shaping a changing policy. Prerequisite: 375.

441-6 Social Work in Selected Agencies. At least 20 hours per week of supervised experience in an approved social work agency with concurrent weekly seminar. Not for graduate credit. Field work practicums begin only in fall and spring semester. Prerequisite: senior standing, 375, 383, 391, 400A, 400B, 401, 402, 411; and a 2.5 grade point average in departmental prerequisites. Must be taken concurrently with 443. Mandatory Pass/Fail.

442-6 Advanced Field Practicum. Supervised field work experience in an approved social service agency with concurrently weekly seminar. At least 20 hours per week. Not for graduate credit. Field work practicums begin only in fall and spring semester. Prerequisite: senior standing, 375, 383, 391, 400A, 400B, 401, 402, 403, 411, 421, and 441, 443 if not taken concurrently in a block placement; and a 2.5 graduate point average in departmental prerequisites. Must be taken concurrently with 444. Mandatory Pass/Fail.

443-1.5 Field Practicum Seminar. The seminar assists the student who is in the field work to systematically conceptualize and integrate the field experience with the general social work practice model and micro and macro social welfare theory. The seminar builds on and reemphasizes content provided in previous social work courses. Seminar discussion focuses on shared field work experiences; practice issues related to social work

principles, ethics, and professionalism; and intervention strategies. Not for graduate credit. Must be taken concurrently with 441.

44-1.5 Advanced Field Practicum Seminar. The seminar assists the student who is in the field work to systematically conceptualize and integrate the field experience with the generic social work practice model and micro and macro social welfare theory. The seminar builds on and reemphasizes content provided in previous social work courses. Seminar discussion focuses on shared field work experiences: practice issues related to social work principles, ethics, and professionalism; and intervention strategies. Not for graduate credit. Must be taken concurrently with 442.

50-1 to 6 (1 per topic) Seminar in Special Issues for Social Work. (a) Practice. (b) Policy and planning. (c) Public welfare services. Topic 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.

61-3 Child and Family Services. Problems of child-parent relationships and difficulties in social functioning of children and adolescents. Adoptions, foster home and institutional placements, protective services. Not for graduate credit. Prerequisite: consent of instructor.

63-2 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.

66-3 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.

89-3 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.

95-1 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.

96-1 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.

00-3 Human Behavior and the Social Environment I. Examination of the theoretical basis of the development and interrelational aspects of individuals. Normal devel-

opmental 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. Deviant behaviors of individuals as affected by social disorganization and value conflicts are discussed. By comparing normal expectations of development, a leverage point of social work intervention is identified. Prerequisite: 500.

502-3 Social Work Processes: Group, Community, and Organizational Analysis. Examination of social change that contributes to the dynamics of community life. Social group, community, and organizational structure and properties are examined with particular emphasis on ethnic, minorities of color, gender, nonurban, and social class perspectives. Prerequisite: advanced standing.

503-3 Foundations of Social Work Fields of Concentration. Advanced practice knowledge and skills including field experiences and lecture series relevant to the student's field of concentration. Prerequisite: advanced standing.

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.

505-3 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.

506-2 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. An overview of fields of social work practice and skills. A systems/holistic approach to problem solving which is generic to problem solving processes at micro and macro levels. Prerequisite: admission to program.

511-3 Social Work Research. An introduction to the importance of scientific inquiry within social work practice. Typical process of knowledge building is examined in terms of how it reinforces social work practice. Prerequisite: admission to program.

512-3 Research Design/Theory Building. Introduction to inductive and deductive methods in social work knowledge building. Included are scientific tools relevant to evaluating social service programs. Prerequisite: advanced standing.

520-3 Social Work Practice II. Continuation of 510 and focuses on developmental skills with groups, communities, and organizations as well as with individuals and families. Prerequisite: 510.

522-3 Professional Issues: Diversity, Ethics, and Values. In-depth analysis of social work as a profession committed to social justice and human rights. Exploration and identification of personal biases and prejudices which limit effectiveness in social service providers. Prerequisite: admission to advanced standing.

530-2 Social Work Practice III. Integrated and eclectic approaches to direct social work practice with individuals, families, and small groups. Appropriate clinical theories particularly relevant to working with populations-at-risk (including teenage parents, single parents, the economically deprived, minority populations of color, etc.) are examined. Prerequisite: 520 or completion of foundation courses in Plan B.

531-2 Selected Topics in Advanced Social Work Practice I. Examination of advanced and in-depth knowledge of clinical social work modalities. Specific interventive modalities will be identified by the student. Prerequisite: 530.

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: 511 or 512.

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 courses in Plan A or B.

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 courses in Plan A or B.

540-2 Social Work Practice IV. Introduction to macro approaches to problem solving and to the assessment of social systems particularly large groups, communities, and organizations. Group facilitation, social engineering, development and utilization of resources, social planning, and administration are emphasized. Prerequisite: 530.

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. Prerequisite: admission to program.

542-4 Social Work Practicum II. Second educationally directed on-site field practice with concurrent seminar. Continuation of 541. Prerequisite: 541.

543-7 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. Prerequisite: 54 or completion of foundation courses in Plan B.

544-7 Social Work Practicum IV. A continuation of the concentration specific practicum of three days in the field for 15 weeks with a concurrent seminar. Prerequisite: 543.

546-1 to 6 Selected Topics in Advanced Social Work Practice II. Exploration and examination of in-depth knowledge and skill particularly useful for leadership positions in the social work profession. Specific topics will be determined by the department identifying students' academic needs. Prerequisite: concurrent enrollment in 540.

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 courses in Plan A or B.

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: 550.

556-1 to 6 Selected Topics in Health, Mental Health Policy and Program Issues. Examination of selected knowledge and skills useful for social work practice in the field of health and mental health. In-depth study of the selected topic will be conducted. Prerequisite: concurrent enrollment in 555.

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 courses in Plan A or B.

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 courses in Plan A or B.

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 courses in Plan A or B.

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 courses in Plan A or B.

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: 560.

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.

566-1 to 6 Selected Topics in Child Welfare Policy and Program Issues. Examination of selected knowledge and skills useful for social work practice in the fields of child welfare and family services. In-depth study on selected topics will be conducted. Prerequisite: concurrent enrollment with 565A, or 565B.

567-2 Seminar in School Social Work. Exploration of policies, programs, practice, and legislative trends affecting public service in school social work. Prerequisite: 533.

70-2 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 courses in Plan A or B.

75-2 Policy and Program Issues of Aging. Examination of public policies that impact on the quality of life of the elderly. Major factors and their effectively exerted advocacy strategies are identified and evaluated. Future policy issues are discussed. Prerequisite: 570.

76-1 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: 70.

77-1 to 4 Selected Topics in Research Methodology. Exploration and actual use of computer programs for social work data analysis. Prerequisite: 532.

78-2 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 courses in Plan A or B.

99-3 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 courses in Plan A or B and departmental approval. Graded *S/U* only.

01-1 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually 3 to 6 hours, before be-

ing eligible to register for this course. 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 human 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.) This course 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 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. A 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.

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.

451-4 Sociology of Language and Signs. (Same as Speech Communication 446.)

Introduction to sociological semiotics with reference to such figures as Eco, Foucault,

Derrida, Baudrillard, Saussure, Habermas, the ethnomethodologists. Emphasis on the place of language and signs in sociological explanation.

454-4 Sociology of Science. Emphasis on the origins and growth of science in historical perspective, reciprocal relations between science and society in the 20th Century, science as a social system, differentiation within and relations between disciplines, and implications of the social organization of scientific research and funding.

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.

465-3 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: none; 6 hours 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.

497-4 Senior Seminar. Contemporary issues in sociology and the analysis of these issues. Not for graduate credit. Prerequisite: senior standing with 20 hours in sociology (including 301), or consent of instructor.

498-1 to 4 Independent Research. With a faculty member the student arranges a research topic resulting in a paper or report. Prerequisite: senior standing with 20 hours of sociology (including 301), and consent of instructor.

501-4 Classical Sociological Theory. A systematic survey of sociological theory with the focus 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.

512-5 Sociological Research. Application of the scientific method of sociological problems. The role of theory. Principles of good research design, measurement, sampling, and research. Under guidance of instructor, students perform a complete research project from devising a research project to writing a scientific report of the project. Prerequisite: at least one course in statistics and five in sociology.

513-4 Methods of Historical Sociology. Investigation of methodological similarities and differences between historical sociology, social history, and social anthropology in the study of historic social changes. Various methodological techniques will be used by the students in seminar papers which analyze specific sets of historic social changes.

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.

529-4 Sampling and Inference in Social Research. Probability. Sampling distributions. Sampling designs. Point and interval estimation. Analysis of variance. Hypothesis testing: parametric and nonparametric approaches. Power and efficiency of statistical tests. Prerequisite: consent of instructor.

530-2 to 12 (2 to 4 per topic) Topical Sem

501-4 Seminar in Sociology. Content varies with interests of instructor and students. Prerequisite: consent of instructor.

532-4 Urban Social Structure. Theories of urban social structure and change, with emphasis on the comparative analysis of ecological and normative processes of integration and disintegration in modern urban communities.

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. Prerequisite: 26A or consent of instructor.

534-4 Seminar in Social Change. Overview of theories and topics including social and economic change in capitalism, underdevelopment, gender, class relations and labor markets, and social and revolutionary movements.

537-4 Sociology of Law. An analysis of the role of law in society. Special emphasis will be given to the relationships between law and social organization, social control, value systems, and social change; consideration will be given to research in the field. Prerequisite: 15 hours of sociology and consent of instructor.

539-4 Seminar in Complex Organization. Emergence and structure of bureaucratic organization. Bases of authority, systems of formal and informal relations, unanticipated consequences. Occupations and professions in complex organizations, line-staff relations, technological changes, and work roles.

542-4 Seminar on the Family. The family as a field of sociological study. Assessment of significant historical and contemporary writing. Prerequisite: 15 hours of sociology including 340 or consent of instructor.

543-4 Seminar in Family Variability and Change. An analysis of the structure, organization, and function of the family in several contemporary and primitive societies. Prerequisite: 15 hours of sociology including 340 or consent of instructor.

551-4 Sociology of Religion. Theoretical and empirical study of the origin, location, and function of religious ideas and institutions in society.

562-4 Deviance and Disorganization. Critical study of sociological theories of social deviance and disorganization and their role in understanding pathologies like alcoholism, homicide, and suicide which exhibit marked variation in group rates. Prerequisite: 15 hours of sociology or consent of instructor.

564-4 Social Factors in Health and Illness. Examination of the significance of social organizational and social psychological factors in the occurrence and treatment of disease and illness. Consideration given to current health care issues, as well as to pertinent theoretical and empirical contributions in the area. Prerequisite: consent of instructor.

572-4 Seminar in Criminology. (Same as administration of Justice 572.) Critical study of important research and theoretical analyses. Prerequisite: consent of instructor.

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 chairperson.

600-1 to 32 (1 to 16 per semester) Dissertation. Prerequisite: consent of chairperson.

601-1 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. Graded *S/U* or *DEF* only.

Special Education

400-3 Introduction to Special Education. Physical, mental, emotional, and social traits of all types of exceptional children and youth. Effects of handicaps in learning situations. Methods of differentiation and techniques for rehabilitation. Case studies, observations, and field trips may be required.

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 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 the 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, 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. Designed to develop competency in students in the administration, scoring, and interpretation of educational tests including the integration of findings from a number of tests. A laboratory fee is required to cover the cost of materials. No textbook is required. Prerequisite: 400 and one of 401, or 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 Planning for Youth in Special Education. Testings, 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 child. Includes field trips, meetings with parents, and visits by resource persons from schools and agencies. Prerequisite: 400, 401.

418-3 Methods and Materials for Teaching Educable Mentally Handicapped Children and Youth. Psychoeducation: 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 with learning disabilities. Prerequisite: 400 and 404.

421-3 Methods and Materials for Teaching Moderately and Severely Handicapped Children. Emphasizes a behavior approach (i.e., systematic instruction) in teaching young students with severe handicap (e.g., moderate MR, severe MR, profound MR, multiply 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. Deals with methods, materials, and instructional management practices common to the instruction of the handicapped. Prerequisite: 400 and one of 401, 402, 403, or 404; or consent of department chairperson.

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 Work-Study Programs for Handicapped Adolescents to Age 21. Deals with modifications of and additions to school programs to insure 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. 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.

490-1 to 5 Readings in Special Education. Study of a highly specific problem area in the education of exceptional children. Open only to selected seniors. Prerequisite: 400 and consent of department chairperson.

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 meth

ods, 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 chairperson.

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. Specialists used as consultants. Open to graduate students majoring in education, guidance, or special education with consent of instructor and department chairperson. Graded S/U only. Prerequisite: 400 and consent of instructor and department chairperson.

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 microcomputer applications with an emphasis on classroom usage. Prerequisite: Curriculum, Instruction, and Media 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 Rehabilitation 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: Curriculum, Instruction, and Media 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 chairperson.

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 chairperson.

590-1 to 5 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.

591-2 to 5 Independent Investigation. A field study required of each student working for the sixth-year degree. Conducted in a school system where full cooperation is extended. The study will involve selection of a problem, surveying pertinent literature, 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 chairperson.

595-1 to 12 (1 to 6) Internship. The doctor 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 regular scheduled on-campus or on-site seminars with University and field internship supervisor.

599-2 to 6 Thesis. Independent hours to be taken under the supervision of the student master's degree chairperson for the purpose of conducting and writing the master's thesis. Prerequisite: 500 and consent of instructor.

600-1 to 32 (1 to 16 per semester) Dissertation. Prerequisite: consent of chairperson.

601-1 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis research hours, usually three to six hours, before being eligible to register for this course. 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 movement dominant in national and international affairs. A lecture, reading, and discussion course. Students may repeat enrollment for 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 to basic reading writing, and spelling. Psychological and social

ological variables affecting language as it relates to school learning. Speech experiences supportive of the child's linguistic, intellectual, and social development.

31-3 Speech in Secondary Schools. Philosophy of speech education, and effective packaging of speech through curricular and extra-curricular work. Prerequisite: twelve hours of speech.

32-3 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, GE-C 200.

33-3 Children's Literature in Performance. Study of children's fiction and poetry through analysis, creative drama, and performance, including solo and group work.

35-3 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.

40-3 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.

41-3 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: 41 or consent of instructor.

42-3 Psychology of Human Communication. Nature, development, and functions of verbal and nonverbal behavior; application of psychological theories and research to the communication process in individuals and groups. Emphasis on the systemic nature of communicative behavior.

43-3 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.

44-3 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 or conducting research involving children.

46-4 Sociology of Language and Signs. See Sociology 451.)

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 Communication 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 value 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, GE-C 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, readings, and assignments focus on performance as a means and an end to creative writing. Prerequisite: None.

480-3 Dynamics of Organizational Communication. Introduction to interrelationships of communicative behaviors 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.

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 climates. 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.

491-1 to 3 Independent Study in Communication. Readings, creative projects, or writing projects focusing on a theoretical study of communication. The independent study should normally be completed in one semester under the tutorial supervision of a faculty sponsor. Not for graduate credit. Prerequisite: twelve hours of speech, consent of instructor, and departmental adviser.

492-2 to 8 Workshop in Oral Interpretation. Summer offering concentrating in specialized areas of oral interpretation.

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.

494-1 to 6 Internship in Public Relations. A supervised experience using public relations skills in a professional or career setting. Maximum of six hours to be counted toward degree requirements. Not for graduate credit. Prerequisite: consent of instructor. Mandatory Pass/Fail.

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

Educational Psychology 506 or its equivalent.

503-3 Seminar: Phenomenological Communication Research. Review and analysis of the types of phenomenological research and methods of data collection relevant to the study of human communication. Prerequisite: 501 and 461 or 562 or equivalent.

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 application 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, communicative behaviors in the speech community, and social exchange. Emphasis on the semantic 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 Communication. 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 contemporaries

French theorists as Barthes, Bourdieu, Foucault, Merleau-Ponty, Perelman, and Ricoeur. Prerequisite: 401 and 461 or consent of instructor.

52-3 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 562, or Philosophy 482 or 425 (same as Speech 35), 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.

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 16 per semester) Dissertation. Minimum of 24 hours to be earned for the Doctor of Philosophy degree.

601-1 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. Graded *S/U* or *DEF* only.

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; an 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. Direction of a full one-act play. Prerequisite: consent of instructor.

403-4 (2, 2) Advanced Theater Speech Studies. (a) Standard stage speech. Advanced training in vocal variety and flexibility. Expanded work with phonetics and application to play readings, poetry, etc. Prerequisite: 203b for undergraduates, no prerequisite for Master of Fine Arts acting students. (b) Vocal characterization. Applications of standard speech to characterization, verse plays, etc. Includes an approach to common American dialects. Prerequisite: 403a.

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.

407-6 (3, 3) Scene Design. (a) Scene design I. Technical and artistic aspects of scene design. Theory and practice. Supplies at least \$25 per semester. Prerequisite: 207, 218a,b, 311a, 354a,b; Art 110; or graduate standing. (b) Scene design II. Sceneography as a dynamic force in theater and related media. Supplies at least \$25 per semester. Prerequisite: 407a, graduate standing or consent of instructor.

408-3 Model Making. The craft of scenic model making for the stage and other dramatic media. Prerequisite: 407 or consent of instructor.

410-3 Children's Theater. Study of methods and their practical application of introducing children to theatre 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 undergraduates 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.

413-4 (2, 2) Advanced Stage Movement. (a) Special movement problems encountered by the actor: falls, combat, mime, working with costumes, props, music. Continued work in characterization and movement skills mastery. Prerequisite: 213a, b for undergraduates; no prerequisite for Master of Fine Arts students. (b) Period styles of movement: bows, curtsies, postures, and dances. Research and practical application. Prerequisite: 413a.

414-6(3,3) Costume Design. (a) History of western costume from Greek to Renaissance and its adaptation to stage use. Theory and practical application of design and color. Prerequisite: 218c and 311a and 354a,b, or graduate standing. Supplies at least \$25 per semester. (b) History of costume from Renaissance through early 20th century. Practical application of methods and procedures in designing costumes. Prerequisite: 414a or graduate standing, or consent of instructor.

417-6 (3, 3) Advanced Acting. (a) Advanced scene study. Scenes from the Poetic Realist. Emphasis is on the ability to build and sustain a character. Audition technique is explored. Prerequisite: 317B or consent of instructor. (b) Elizabethan style. Scenes and soliloquys from the plays of Shakespeare, Marlowe, Jonson. Fencing and stage combat applied to scene work. Prerequisite: 417a or consent of instructor.

418-3 Advanced Stage Lighting. Investigation of stage lighting design, theory, and professional practice. Special attention will be focused on color theory and its application to stage lighting. Four hours lecture and laboratory. Prerequisite: 218b, graduate standing, or consent of instructor.

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, 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 provide 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 reading 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.

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.

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 depart-

mental graduate committee required. Graded *S/U* only.

561-1 to 12 Theatre Internship. After completion of the MFA 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 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. 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.

403-3 Microform Systems An introduction to the use of microforms in the management of information flow. Emphasis is placed on analysis of application, effectiveness, and cost of available microform systems, techniques, and equipment. Not for graduate credit.

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.

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. Prerequisite: 403.

410-2 Principles and Problems of Business Education. A study of the fundamentals of business education; its relation to busi-

ness, to general education, and to vocational and career education; its history, current status, and trends; special emphasis on objectives and curriculum problems.

411-3 Curriculum and Methods in Business Education Instruction. An introduction to curriculum materials and instructional methods used in the many content areas of business education. This course is the first of a sequence of specific business education instructional methods courses. Prerequisite: 310, business education major or minor.

412-2 Teaching Accounting and Data Processing. Specific methods and techniques to teach in the business education areas of accounting and data processing. Prerequisite: 306, 411, Accounting 220 or School of Technical Careers 120.

413-2 Teaching Keyboarding, Communication, and Office Systems. Specific methods and techniques to teach in the business education areas of keyboarding, communications, and office systems and procedures. Prerequisite: 404, 411, Secretarial and Office Specialties 101d or equivalent.

414-2 Teaching Shorthand. Specific methods and techniques to teach shorthand in a business education curriculum. Prerequisite: 304, 411, Secretarial and Office Specialties 102d or equivalent.

418-2 Teaching Basic Business, Consumer, and Marketing Education. Specific methods and techniques to teach basic business, consumer, and marketing education in a business education curriculum. Prerequisite: 411, GE-B 205 or Marketing 304.

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.

433-3 Women and the Politics of Education. Ways of organizing to implement legislation for social needs. How to have input into decisions which affect the educational community—reimbursement, grants, funding. The need, impact, and opportunity for careers in public service as these relate to individual, family, and societal needs. Field trips.

439-3 Historic Clothing: Western Cultures. Development of clothing in western civilization to the present time. Consideration of social, economic, and esthetic factors, and technical innovations influencing clothing. Prerequisite: 347 or equivalent.

440-3 Experimental Costume Apparel Designing. Development of apparel to meet esthetic, structural, and functional needs;

problemsolving for exceptional proportions, rehabilitation, activity, performing arts, new technology, materials, and environment. Some patterns originated in 440 may be tailored following a semester in 446. Prerequisite: 340, 342, and 348 or equivalent.

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: GE-B 211 or Economics 214.

444-4 Mass Market Apparel Designing. Design of a line to specifications; drafting; toiles; mass-production costs; work flow; use of industrial equipment. Field trips. Prerequisite: 340 and 342 or equivalent.

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.

446-3 Professional Practices in Fashion Design. Business principles of apparel design including systems, forms, and logistics of money and materials. Functions and responsibilities of the fashion designer. Career opportunities in the fashion industry. Not for graduate credit. Prerequisite: 340, 342, 344.

448-3 Custom Tailoring. Individualizing, fitting, and contouring of male and female garment for customer from commercial pattern or from original pattern design. Organization of work and time. Not for graduate credit. Prerequisite: 348 or equivalent.

449-3 Historic Clothing: Nonwestern Cultures. Traditional dress in nonwestern cultures. Aesthetics, symbolism, and uses of costume in the culture; effect of clothing on economy. Cultures studied may vary with each offering. 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. (b) Business education, (d) industrial education, (e) health occupations 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. (d) Industrial education, (e) health occupations 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 for 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 the 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 and Management of IA Programs. Study of contemporary approaches to the teaching of industrial arts including objective philosophies, advantages, and disadvantages; shop or laboratory design and organization; and the management of programs in shops or laboratories. Not for graduate credit. Prerequisite: junior standing.

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.

486-3 (1, 1, 1) Post-Secondary Vocational-Technical Teaching. Contemporary approaches to teaching vocational-technical education in post-secondary institutions and agencies. (a) Orientation to and preparation for teaching occupations; (b) situations and issues which arise in professional education sessions; (c) interpersonal relations in teaching and other educational assignments. Not for graduate credit.

488-3 Initiating Vocational Student Placement and Follow-up. Planning, implement, and evaluating a school-based placement system for secondary and post-secondary vocation, technical, and adult education students.

489-3 Developing Vocational Student Placement and Follow-Up. Developing and using internal and external resources in a functioning placement and follow-up program. Prerequisite: 488.

490-1 to 4 Readings. Supervised reading for qualified students. May include independent study. (a) Agricultural education, (b) business education, (c) home economics education, (d) industrial education, (e) health occupations education, (f) clothing and textiles. 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, (f) clothing and textiles. 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 on each workshop will be identified in each workshop announcement. (a) Agricultural education, (b) business education, (c) home economics education, (d) industrial education, (e) health occupations education, (f) clothing and textiles.

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: ten hours of 395 and three hours of teaching methods.

496-2 to 12 Professional Internship. Research or curriculum development or program management at approved education or training sites. The intern will follow the program of the supervising professional in regular and related activities. Not for graduate credit. Prerequisite: 18 months full-time equivalent of documented or 9 months full-time equivalent of supervised work experience or a combination.

497-1 to 6 Practicum. Applications of vocational, occupational, or career education skills and knowledges. Cooperative arrangements with corporations and professional agencies to study under specialists. (a) Agricultural education, (b) business education, (c) home economics education, (d) industrial education, (e) health occupations education, (f) clothing and textiles. 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) home economics education, (d) industrial education, (e) health occupations education, (f) clothing and textiles. 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 instructor; 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.

592-1 to 6 Recent Research. Review of selected action-oriented research and its applications by practitioners.

593-1 to 3 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 Dissertation.

601-1 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. Graded *S/U* or *DEF* only.

Women's Studies

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. (Same as Pols 429.) 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.

447-3 Ascriptive Politics: Gender, Race, Ethnicity. (See Political Science 451.)

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.)

488-3 Women in the Home and Labor Market. (See Consumer Economics and Family Management 480.)

490-1 to 6 Readings. Supervised readings in selected content areas of women's studies. Prerequisite: consent of instructor and coordinator of women's studies.

491-1 to 6 Special Topics. Concentration on a topic of interest not offered through the regular course listings. Prerequisite: consent of the faculty member instructing the course and the women's studies coordinator.

492-3 to 6 Seminar in Women's Studies. A synthesizing experience for seniors minoring in women's studies and graduate students from various departments. Activity may include, but is not limited to, a research project. Prerequisite: completion of a women's studies general course and either senior or graduate standing; also 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 report which is filed with the coordinator of women's studies. Prerequisite: senior standing, consent of supervising faculty member and coordinator of women's studies.

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 supervising faculty member and the coordinator of women's studies.

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.

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. Cost of \$10 to \$20 may be incurred by student. 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. Cost of \$5 may be incurred by student. Offered fall semester. Prerequisite: 220a.

407-4 Parasitology. Principles, collection, identification, morphology, life histories, and control measures. Two lectures and two 2-hour laboratories per week. Cost of \$5 may be incurred by student. Offered spring semester. 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. Cost of \$5 may be incurred by student. Offered fall semester. 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. Cost of \$5 may be incurred by student. Offered spring semester. Prerequisite: 10 to 12 semester hours of biological science.

410-6 (3, 3) Vertebrate Paleontology. History of vertebrate animals in terms of their morphological change, geological succession, and ecological relationships. (a) Fossil fishes, amphibians, reptiles, and birds. (b) Fossil mammals. Two lectures and one 2-hour labo-

ratory per week. Cost of \$5 may be incurred by student. Offered (a) fall; (b) spring semesters. Prerequisite: 220b.

413-6 (3, 3) The Invertebrates. (a) Structure, phylogeny, and habitats of the lower invertebrates through lophophorates and deuterostomes except echinoderms. (b) Structure, phylogeny, and habitats of the higher invertebrates including echinoderms, molluscs, annelids, and arthropods. Three 2-hour laboratories per week. Cost of \$5 may be incurred by the student. Offered spring semester, (a) alternate even years; (b) alternate odd years. Cost of \$5 may be incurred by student. 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 spring semester. Cost of \$15 to \$20 may be incurred by student for field trips. Prerequisite: 220a.

415-3 Limnology. Lakes and inland waters; the organisms living in them, and the factors affecting those organisms. Two lectures per week and one 4-hour laboratory alternate weeks. Cost of \$15 to \$20 may be incurred by student. Offered fall semester. 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. Cost of \$15 may be incurred by student. Offered fall semester. 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. Includes ablation and histology of glands and chemical and bio-assays with vertebrates and invertebrates. Two lectures and one 2-hour laboratory per week. Cost of \$5 to \$10 may be incurred by student. Offered spring semester. Prerequisite: 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 three or four Saturday field trips. Cost of field trips up to \$25 per student. Prerequisite: 220b or consent of instructor.

461-3 Mammalogy. Taxonomic groups, identification, and natural history of mammals. One hour lecture and two 2-hour laboratories per week. Cost of \$10 may be incurred by student. Offered fall 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. Cost of field trips up to \$25 per student. Prerequisite: 220b or consent of instructor.

463-3 Game Mammals. Natural history and management. Two lectures and one 2-hour laboratory per week. Cost of \$5 may be incurred by student. Prerequisite: 220b or consent of instructor.

464-3 Wildlife Administration and Policy. Responsibilities of private, state, and fed-

eral natural resources management agencies. Legal and political processes in areas of wild-life and natural resources. Three lectures per week. Offered spring semester. Prerequisite: consent of instructor.

465-3 Ichthyology. Taxonomic groups, identification, and natural history of fishes. Two lectures and one 2-hour laboratory per week. Cost of \$10 may be incurred by student. Offered spring semester. 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. Cost of field trips up to \$25 per student. Offered fall semester. 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. Cost of field trips may be up to \$20 per student. Offered spring semester. 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. Cost of field trips up to \$25 per student may be incurred. Offered fall semester. Prerequisite: 10 semester hours of biological science; concurrent enrollment in 468a and 468b desirable.

471-3 Entomology. Structure, classification, and life histories of insects. One lecture and two 2-hour laboratories per week. Offered fall semester. Cost up to \$20 may be incurred by student for field trips. Prerequisite: 220a.

473-3 Aquatic Entomology. Structure, classification, and biology of aquatic insects. One lecture and two 2-hour laboratories per week. Cost up to \$20 may be incurred by student. Offered spring semester. Prerequisite: 220a.

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 sessions. 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.

493-1 to 6 Honors Research. Individual research for honors students in zoology. Prerequisite: approval by department chair and a faculty supervisor. For undergraduate credit only.

496-2 to 4 Zoology Field Studies. A trip of four to eight weeks to acquaint students with animals in various environments and/or with methods of field study, collection, and preservation. Cost of \$25 may be incurred by the student. Offered fall, spring, summer semesters. Prerequisite: consent of department.

508-2 Helminthology. Identification, structure, physiology, and life history of parasitic worms. Two lectures per week. 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. Cost of \$5 may be incurred by student. 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. Cost of \$10 may be incurred by student. Two lectures per week and one 4-hour laboratory alternate weeks. Prerequisite: 415 and consent of instructor.

525-3 Cytology. (Same as Botany 525.) 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.

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.

542-3 Osteology. Modification of the vertebrate skeleton as a result of growth, functional adaptation, and phylogenetic relationship. Two lectures and two 1-hour laboratories per 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 monitoring of biofilters, harvesting and grading, diagnosis and treatment of parasites and diseases, and transporting of fish. One credit for completion of two 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. Cost of \$5 may be incurred by student. Prerequisite: consent of instructor.

568-2 Fish Stock Assessment. Methods of characterizing fish populations including mortality rates, age and 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. Cost of \$10 may be incurred by student. Prerequisite: Biology 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.

580-3 Advanced Taxonomy. The theory and practice of taxonomy, classification, and nomenclature. Three meetings per week, two hours each. Prerequisite: consent of instructor.

581-2 Zoological Literature. Diversity and functions of zoological literature, scientific writing, and the publication process. Two lec-

tures per week. Prerequisite: graduate status in a biological science.

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.

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, Biology 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.

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 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 to 12 per semester Continuing Research. For those graduate students who have not finished their degree programs and who are in the process of working on their dissertation or thesis. The student must have completed a minimum of 24 hours of dissertation research, 600, or a minimum of thesis or research hours, usually three to six hours, before being eligible to register for this course. Graded S/U or DEF only.

4 Faculty

Graduate instruction at Southern Illinois University at Carbondale is the responsibility of the graduate faculty. Although the graduate faculty is not organized into departments, its members are normally affiliated with specific disciplines. 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.

Preceding the graduate faculty is a list of faculty members and students elected to the Graduate Council for the year.

Members of the Graduate Council for 1986-1987

Brooks Burr, Associate Professor, Zoology
Patricia L. Carrell, Associate Dean, Graduate School
Arthur Casebeer, Professor, Higher Education
Hussein Elsaid, Professor, Finance
Richard E. Falvo, Associate Dean, Graduate School
Susan Ford, Associate Professor, Anthropology
Thomas Gutteridge, (Ex-Officio), Dean's Council Representative, College of Business and Administration
John Guyon, (Ex-Officio), Vice President for Academic Affairs and Research
Darrell Johnson, Student, Philosophy
David Kammler, Professor, Mathematics
Eric Landrum, Student, Psychology
Richard Lanigan, Professor, Speech Communication
Richard Lawson, Associate Professor, English
Dennis Leitner, Associate Professor, Educational Psychology
James Leming, Associate Professor, Curriculum, Instruction, and Media

Colin Low, Student, Management
Ken Medve, Student, Zoology
Hurley Myers, Associate Professor, Physiology
Aristotel Pappelis, Professor, Botany
Nancy Parsons, Student, Health Education
Robert Paulson, Professor, Art
Kenneth Peterson, (Ex-Officio), Dean, Library Affairs
Rudolph Nick Peterson, Professor, Physiology
Robert C. Radtke, Associate Professor, Psychology
Cyril D. Robinson, Associate Professor, Administration of Justice
Sadat Sami, Professor, Civil Engineering and Mechanics
Steve Scheiner, Professor, Chemistry
Herbert Snyder, Professor, Mathematics
Albert Somit, (Ex-Officio), President
Donald Stucky, Professor, Plant and Soil Science
Eugene Timpe, Professor, Foreign Languages and Literatures
John Verduin, Professor, Educational Administration and Higher Education
John Yopp, (Ex-Officio), Dean, Graduate School
Stanley Zucker, Professor, History

Accountancy

COLLEGE OF BUSINESS AND ADMINISTRATION

Barron, Mary Noel, Associate Professor, *Emerita*, C.P.A., M.B.A., University of Michigan, 1946; 1948. Financial accounting, tax.

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. Auditing, and financial accounting.

Hahn, Randall, Assistant Professor, C.P.A., Ph.D., University of Kentucky, 1984; 1984. Taxation and auditing.

Joy, David, Assistant Professor, C.P.A., Ph.D., University of Nebraska, 1984; 1983. Taxation and financial accounting.

Karnes, Allan, Assistant Professor, C.P.A., M.A., J.D., Southern Illinois University at Carbondale, 1986; 1977. Taxation and auditing.

Kennett, Danny, Assistant Professor, Ph.D., Mississippi State University, 1983; 1983. Auditing.

Masoner, Michael M., Associate Professor, C.P.A., Ph.D., University of Minnesota, 1975; 1978. Auditing theory, cost accounting.

Rigsby, John T., Assistant Professor, C.P.A., Ph.D., Memphis State University, 1986; 1984. Financial accounting and auditing.

Rivers, Richard, Associate Professor, C.P.A., D.B.A., Kent State University, 1976; 1978. Quantitative decision models, and information systems.

Sterner, Julie, Assistant 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.

Wright, Roland M., Professor, *Emeritus*, C.P.A., Ph.D., University of Iowa, 1962; 1966. Financial accounting and accounting theory.

Wu, Fred, Professor and *Chair*, C.M.A., D.B.A., Texas Tech University, 1975; 1984. Information systems and managerial accounting.

Agribusiness Economics

SCHOOL OF AGRICULTURE

Beaulieu, Jeffrey R., Assistant Professor, Ph.D., Iowa State University, 1984; 1983.

Beck, Robert J., Assistant Professor, Ph.D., Pennsylvania State University, 1977; 1984.

Eberle, Phillip R., Assistant Professor, Ph.D., Iowa State University, 1983; 1983.

Harris, Kim S., Assistant Professor, Ph.D., University of Illinois, 1985; 1984.

Herr, William McD., Professor and *Chair*, Ph.D., Cornell University, 1954; 1957.

Keeper, Wendell E., Professor, *Emeritus*, Ph.D., Cornell University, 1938; 1950.

Kraft, Steven E., Assistant Professor, Ph.D., Cornell University, 1976; 1980.

Solverson, Lyle, Associate Professor, Ph.D., University of Wisconsin, 1967; 1966.

Wills, Walter J., Professor, *Emeritus*, Ph.D., University of Illinois, 1952; 1956.

Agricultural Education and Mechanization

SCHOOL 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, Associate Professor and *Chair*, Ph.D., Cornell University, 1976; 1977.

Patterson, Richard J., Assistant Professor, Ph.D., Michigan State University, 1981; 1980.

Reneau, Fred, Associate Professor, Ed.D., Virginia Tech, 1979; 1979.

Stitt, Thomas R., Professor, Ph.D., Ohio State University, 1967; 1967.

Wolff, Robert L., Professor, Ph.D., Louisiana State University, 1971; 1972.

Wood, Eugene S., Professor, *Emeritus*, Ed.D., University of Missouri, 1958; 1949.

Animal Industries

SCHOOL OF AGRICULTURE

Arthur, Robert, Associate Professor, 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. Food and nutrition.

Endres, Jeannette M., Professor, Ph.D., St. Louis University, 1972; 1975. Community nutrition, dietetics, life cycle nutrition.

Goodman, Bill L., Professor, Ph.D., Ohio State University, 1959; 1958. Animal breeding and genetics, poultry production.

Harper, Jenny M., Professor, *Emerita*, Ph.D., Cornell University, 1941; 1958. Food and nutrition.

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. Horse management.

King, Sheryl S., Assistant Professor, Ph.D., University of California-Davis, 1982; 1982. Reproduction physiology, equine science.

Konishi, Frank, Professor, *Emeritus*, Ph.D., Cornell University, 1958. Food and nutrition.

Kroening, Gilbert H., Professor, Ph.D., Cornell University, 1965; 1969. Swine production, monogastric nutrition.

Olson, Howard H., Professor, Ph.D., University of Minnesota, 1952; 1954. Reproductive physiology; dairy cattle production; international animal agriculture.

Payne, Irene R. Professor, *Emerita*, Ph.D., Cornell University, 1960; 1965. Food and nutrition.

Reed, Alex, Professor, *Emeritus*, Ph.D., University of Illinois, 1953; 1946.

Strack, Louis E., Associate Professor, D.V.M., University of Illinois, 1961; 1968. Veterinary medicine.

Welch, Patricia K., Assistant 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 and *Chair*, Ph.D., University of Kentucky, 1969; 1980. Ruminant nutrition, forages.

Anthropology

COLLEGE OF LIBERAL ARTS

Bender, M. Lionel, Professor, Ph.D., University of Texas at Austin, 1968; 1971. Linguistic anthropology, Sahelian languages; Ethiopia, Africa.

Braun, David P., Associate Professor, Ph.D., University of Michigan, 1977; 1977. Archaeology, method and theory, prehistoric cultural ecology quantitative methods, Eastern USA.

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.

Corruccini, Robert S., Professor, Ph.D., University of California, Berkeley, 1975; 1978. Physical anthropology, paleontology, osteology, multivariate methods, dental anthropology. D.O.G.S.

Dark, Philip J. C., Professor, *Emeritus*, Ph.D., Yale University, 1954; 1960.

Ford, Susan M., Associate Professor, Ph.D., University of Pittsburgh, 1980; 1979. Physical anthropology, primate paleontology, evolutionary theory, anatomy, South America.

Gumerman, George J., Professor and *Acting Chair*, Ph.D., University of Arizona, 1968; 1973. Archaeology, archaeological cooperatives, culture change, remote sensing, 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; Caribbean, Africa.

Hill, Jonathan D., Assistant Professor, 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, comparative religions, customary law and ethics; Southeast Asia, US Southwest.

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, Ph.D., Harvard University, 1967; 1966. Archaeology, art analysis and culture theory; Eastern USA, Africa.

Powell, Shirley, Adjunct Assistant Professor, Ph.D., Arizona State University, 1980; 1977. Archaeology, method and theory, cultural resource management, ethnoarchaeology, United States—Southwest.

Rands, Robert L., Professor, Ph.D., Columbia University, 1952; 1966. Archaeology, ceramic technology, comparative art; Mesoamerica.

Riley, Carroll L., Distinguished Professor, Ph.D., University of New Mexico, 1952; 1955. Ethnology, ethnohistory, origins of civilizations; Northern Mexico, US Southwest.

Taylor, Walter W., Professor, *Emeritus*, Ph.D., Harvard University, 1943; 1958.

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. Low-cost solar energy, biomass conversion, alcohol fuels.

Bernstein, Lawrence A., Associate Professor, M.F.A., Cranbrook Academy of Art, 1953; 1962. Drawing and painting.

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, Assistant Professor, M.S., Southern Illinois University at Carbondale, 1970; 1970. Energy conservation and low-cost solar design.

Chapman, Gretel, Associate Professor, Ph.D., University of Chicago, 1964; 1984. Art history.

Covington, Patricia, Assistant Professor, Ph.D., Southern Illinois University at Carbondale, 1981; 1974. Art history.

Deller, Harris, Associate Professor, M.F.A., Cranbrook Academy of Art, 1973; 1975. Ceramics.

Donnelly, Brian, Assistant Professor, M.F.A., Rhode Island School of Design, 1980; 1985. Product design.

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.

Johnson, Evert A., Lecturer, M.A., University of Iowa, 1954; 1966. Curator of art, University Museum and Art Galleries.

Kington, L. Brent, Professor and Director, M.F.A., Cranbrook Academy of Art, 1961; 1961. Metals, blacksmithing.

Lintault, M. Joan, Associate 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., Associate 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.

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, M.A., Columbia University, 1951; 1952. Sculpture.

Vivian, Ann, Assistant Professor, M.F.A., Syracuse University, 1984; 1986. Visual communications.

Walsh, Thomas J., Professor, M.F.A., University of Michigan, 1962; 1967. Sculpture and foundry.

Whitlock, John J., Adjunct Associate Professor, Ed.D., Indiana University, 1971; 1978. Museum and art galleries.

Wood, Dan D., Associate Professor, M.A., University of Iowa, 1968; 1968. General studies and drawing.

Youngblood, Michael, Associate Professor, Ph.D., University of Oregon, 1975; 1979. Art education.

Botany

COLLEGE OF SCIENCE

Ashby, William C., Professor, Ph.D., University of Chicago, 1950; 1960. Stripmine reclamation; forest ecology; tree growth.

Bissing, Donald R., Assistant Professor, Ph.D., Claremont Graduate School, 1976; 1976. Ecological and systematic plant anatomy.

Bozzola, John J., Associate Professor, Ph.D., Southern Illinois University at Carbondale, 1975; 1983. Transmission and scanning electron microscopy.

Crandall-Stotler, Barbara, Professor, Ph.D., University of Cincinnati, 1968; 1970.

Developmental morphology; bryology; experimental studies; ultrastructure; phylogenesis.

Matten, Lawrence C., Professor, Ph.D., Cornell University, 1965; 1965. Paleobotany plant anatomy; Devonian-Mississippian plants; evolution of ferns, progymnosperms and gymnosperms; early seeds.

Mohlenbrock, Robert H., Distinguished Professor, Ph.D., Washington University 1957; 1957. Taxonomy; Illinois flora; leguminosae; endangered species.

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 cytofluorescence.

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.

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., Associate Professor, Ph.D., University of Cincinnati, 1968; 1969. Bryology; biosystematics; regional flora; community structure.

Sundberg, Walter J., Associate Professor, Ph.D., University of California, 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. Phycology; algal development under natural conditions; ecology of aquatic vascular plants; toxic 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.

Voigt, John W., Professor and Acting Chair Ph.D., University of Nebraska, 1950; 1950. Ecology; grasslands.

Yopp, John H., Professor, Ph.D., University of Louisville, 1969; 1970. Plant physiology; developmental plant physiology; environmental regulation of metabolic pathways.

Center for the Study of Crime, Delinquency, and Corrections

COLLEGE OF HUMAN RESOURCES

Anderson, Dennis B., Associate Professor, Ed.D., University of Nebraska, 1970; 1970. Educational psychology; police and forensic 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. Criminal and juvenile justice management/correctional casework.

Ferdinand, Theodore N., Professor and Director, Ph.D., University of Michigan, 1961; 1985. Social psychology; juvenile delinquency; juvenile justice; history of crime and criminal justice.

Johnson, Elmer H., Professor, Ph.D., University of Wisconsin, 1950; 1966. Sociology, criminology; international criminal justice.

LeBeau, James L., Assistant 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, M.A., University of Kansas City, 1951; 1962. Guidance and counseling, psychology, higher education.

Riedel, Marc P., Associate Professor, Ph.D., University of Pennsylvania, 1972; 1978. Sociology; research methods; violence.

Robinson, Cyril D., Professor, LL.B., Northwestern University, 1952; 1979. Criminal law; history and function of police; police and courts.

Timm, Howard W., Associate Professor, Ph.D., Michigan State University, 1979; 1980. Forensic hypnosis research; security.

Wilson, Nanci K., Associate Professor, Ph.D., University of Tennessee, 1972; 1972. Sociology; theoretical criminology; gender and crime.

Chemistry and Biochemistry

COLLEGE OF SCIENCE

Arnold, Richard T., Professor, *Emeritus*, Ph.D., University of Illinois, 1937; 1969.

Beyler, Roger E., Professor, Ph.D., University of Illinois, 1949; 1959. Organic, steroids.

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, Ph.D., Iowa State University, 1961; 1964. Analytical, reactions and analytical applications of o-nitrosophenols, trace constituents in biological samples, design of chelating agents, spectrophotometric determinations, coordination compounds of cobalt, trace substances and environmental health.

Dunaway, George, Associate Professor, Ph.D., University of Oklahoma, 1970; 1975. Regulation of energy/metabolism during diabetes; development and aging; induction of experimental ulcers in rats.

Dunkerton, Lois V., Assistant Professor, Ph.D., Cornell University, 1975; 1982. Organ-

ic, synthetic and structural studies on biologically active natural products, biochemical intermediates, carbohydrate chemistry, antibiotics, organometallic chemistry, synthetic methods.

Gupta, Ramesh, Assistant 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, Ph.D., University of Wisconsin, 1952; 1966. Biochemistry, oxidative phosphorylation, chemical carcinogenesis, organellar genes.

Hadley, Elbert H., Professor, *Emeritus*, Ph.D., Duke University, 1940; 1947.

Hall, J. Herbert, Professor, Ph.D., University of Michigan, 1959; 1962. Organic, reactions of organic azides, chemistry of nitrene intermediates, reactions of singlet and triplet states, synthesis and reactions of small ring heterocyclic compounds, 1-3-dipolar additions, 2 + 2 cycloadditions, EPR studies of organic nitrogen compounds.

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., Assistant 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.

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.

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.

Schmubach, C. David, Professor, Ph.D., University of Illinois, 1958; 1965. Inorganic stabilization of uncommon oxidation states, activation of small molecules by complexation and homogeneous catalysis, applications of high pressure spectroscopy.

Shriver, John W., Assistant 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 and *Chair*, 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, Ph.D., Ohio State University, 1948; 1967. Organic, acetylenes, allenes, the propargylic rearrangement, polyacetylenes, domestic and foreign institutional research, history of chemistry.

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., Assistant 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 *Acting Chair* M.F.A., Ohio University, 1969; 1969. Fine arts photography.

Horrell, C. William, Professor, *Emeritus*, Ed.D., Indiana University, 1955; 1949. Professional photography.

Kolb, Gary P., Assistant Professor, M.F.A.,

Ohio University, 1977. Professional photography.

Mercer, John, Professor, *Emeritus*, Ph.D., University of Nebraska, 1952; 1958. Cinema studies.

Paine, Frank, Associate Professor, *Emeritus*, B.S., Iowa State University, 1950; 1960. Cinema production.

Powell, W. Duane, Assistant Professor, M.F.A., University of Illinois, 1977; 1978. Professional photography.

Swedlund, Charles A., Professor, M.S., Illinois Institute of Technology, 1961; 1971. Fine arts 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.

Cradock, James N., Associate Professor, Ph.D., University of Illinois, 1979; 1980. Solid mechanics, stress analysis; computational mechanics, composite materials.

Davis, Philip K., Professor and *Chair*, Ph.D., University of Michigan, 1963; 1964. Fluid mechanics, hydraulics, solid-liquid separation and vibrations.

DeVantier, Bruce A., Assistant 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.

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.

Ponce-Campos, C. David, Associate Professor, Ph.D., University of Michigan, 1978; 1985. Fluid transients, multiphase flow, numerical methods, coastal engineering.

Puri, Vijay, Assistant Professor, Ph.D., University of Missouri-Rolla, 1984; 1986. Geotechnical engineering, soil dynamics, machine foundations, liquefaction of soils.

Ray, Bill T., Assistant Professor, Ph.D., University of Missouri-Rolla, 1984; 1985. Chemical and biological treatment, fixed-film reactors, residuals management, toxic waste treatment.

Rubayi, Najim, Professor, Ph.D., University of Wisconsin, 1966; 1966. Solid mechanics, vibrations, experimental stress analysis, and photoelasticity.

Sami, Sedat, Professor, Ph.D., University of

owa, 1966; 1966. Fluid mechanics, hydraulics and hydrology.

Wright, Maurice, Professor, Ph.D., University of Wales, United Kingdom, 1962; 1984. Fiber reinforced composites and fracture mechanics.

Yen, Shing-Chung, Assistant 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, Ph.D., Ohio State University, 1950; 1950. Articulation, cerebral palsy, cleft palate, geriatrics.

Bermejo, Juan J., Assistant Professor, Ph.D., Ohio University, 1984; 1984. Audiology, auditory electrophysiology.

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. Voice problems, phonetics, dynamics of speech, cleft palate.

Brutten, Gene J., Professor, 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.

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. Training the speaking voice, audiology, aural rehabilitation, administration.

Robey, Randall R., Assistant Professor, Ph.D., Ohio University, 1984; 1984. Neurogenic communication disorders, multivariate statistics.

Ruder, Kenneth F., Professor and *Chair*, 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

GRADUATE SCHOOL

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.

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.

Schoen, Alan, Professor, Ph.D., University of Illinois, 1958; 1973.

Computer Science

COLLEGE OF LIBERAL ARTS

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.

Garg, A. K., Assistant Professor, Ph.D., University of Toronto, 1984; 1985. File organization, database management, distributed databases, data structures.

Mark, Abraham M., Professor, *Emeritus*, Ph.D., Cornell University, 1947; 1950. Computer science education, combinatorics, numerical analysis, probability.

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.

Srimani, P. K., Associate Professor, University of Calcutta, 1978; 1984. Fault-tolerant computing, heuristic search, application of graph theory, data structures, analysis of algorithms.

Tejwani, Y. J., Assistant Professor, Ph.D., University of Arkansas, 1983; 1985. Pattern recognition and image processing, automated reasoning, communication theory, digital signal processing, automata theory, compiler construction.

Varol, Y. J., Professor and *Chair*, Ph.D., University of Wyoming, 1971; 1978. Analysis and design of computing algorithms, data structures, information processing, discrete simulation, distributed databases.

Wallis, W. D., Professor, Ph.D., University of Sydney, 1968; 1986. Combinatorics and graph

theory, cryptography, optimization, complexity, programming languages.

Wright, W. E., Associate Professor, D.Sc., Washington University, 1972; 1970. File organization, data structures, database management.

Zargham, M. R., Assistant Professor, Ph.D., Michigan State University, 1983; 1986. Computer networks, computer architecture, petri nets, VLSI.

Curriculum, Instruction, and Media

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., Assistant 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, Associate 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.

Brod, Ernest E., Professor, *Emeritus*, Ed.D., University of Northern Colorado, 1953; 1951.

Butts, Gordon K., Professor, *Emeritus*, Ed.D., Indiana University, 1956; 1950.

Byrd, David M., Associate Professor, Ph.D., Syracuse University, 1980; 1979.

Casey, John P., Professor, *Emeritus*, Ed.D., Indiana University, 1963; 1964.

Copenhaver, Ron, Associate Professor, Ed.D., Indiana University, 1979; 1978.

Coscarelli, William, Associate 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, Associate 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, John D., Associate Professor, Ed.D., Syracuse University, 1977; 1977.

Mees, John D., Professor, *Emeritus*, Ed.D., Indiana University, 1950; 1946.

Moore, Eryn E., Assistant Professor, Ph.D., Southern Illinois University at Carbondale, 1976; 1968.

Nelson, Joann N., Assistant Professor, 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.

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.

Scheer, Janet K., Associate Professor, Ph.D., Arizona State University, 1977; 1977.

Seifert, Berniece B., Professor, Ed.D., University of Missouri, 1955; 1955.

Shepherd, Terry R., Associate Professor, Ph.D., University of Illinois, 1971; 1971.

Shrock, Sharon A., Assistant Professor, Ph.D., Indiana University, 1978; 1984.

Sloan, Fred A., Professor, Ed.D., George Peabody College for Teachers, 1959; 1968.

Smith, Lynn C., Assistant 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.

Stephens, Clarence, Professor, *Emeritus*, Ph.D., Indiana University, 1955; 1952.
Vendt, 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

Chun, Youngsub, Assistant Professor, Ph.D., University of Rochester, 1986; 1986. Game theory; microeconomic theory.
Illis, Robert J., Jr., Associate Professor and Chair, Ph.D., University of Virginia, 1966; 1962. Labor economics.
Jedelman, Milton, Professor, Ph.D., *Emeritus*, University of Illinois, 1951; 1950. Labor economics.
Ware, Rolf, Professor, Docent, University of Lund, Sweden, 1976; 1978. Microeconomic theory, mathematical economics.
Worran, 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*, Vandever Chair of Economics, Ph.D., University of Iowa, 1942; 1960. Political economy, methodology and history of thought.
Layner, Robert G., Professor, Ph.D., *Emeritus*, Harvard University, 1952; 1955. Economic history, comparative systems.
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, Vandever Chair of Economics, Ph.D., University of Rochester, 1962; 1982. International economics, macroeconomics, mathematics, microeconomics.
Prescott, 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.
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, Royce R., Professor, *Emeritus*, Ed.D., Washington University, 1952; 1948.
Buser, Robert L., Professor, Ed.D., Indiana University, 1966; 1967.
Caldwell, Oliver J., Professor, *Emeritus*, M.S. Oberlin College, 1927; 1966.
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.
Grinnell, John E., Professor, *Emeritus*, Ph.D., Stanford University, 1934; 1955.
Hall, James H., Associate Professor, *Emeritus*, Ed.D., George Washington University, 1950; 1952.
Hawley, John B., Professor, 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.
Jellen, Hans, Assistant Professor, Ph.D., University of Virginia, 1981; 1981.
Kaiser, Dale E., Professor, 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.

Matthias, William, Associate Professor, 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.

Swinburne, Bruce R., Associate Professor, Ed.D., Indiana University, 1970; 1970.

Tolle, Donald J., Professor, *Emeritus*, Ed.D., Florida State University, 1957; 1967.

Verduin, John R., Jr., Professor, Ph.D., Michigan State University, 1962; 1967.

Warren, F. G., Professor, *Emeritus*, A.M., University of Chicago, 1928; 1913.

Wohlwend, Herbert W., Associate Professor, *Emeritus*, Ph.D., Southern Illinois University at Carbondale, 1964; 1958.

Zimmerman, Elwyn, Assistant Professor, Ph.D., Michigan State University, 1963; 1966.

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-Summer, Ronna, Professor, Ph.D., University of California, Riverside, 1978; 1978.

Elmore, Patricia B., Professor, Ph.D., Southern Illinois University at Carbondale, 1970; 1967.

Goh, David S., Professor, Ph.D., University of Wisconsin-Madison, 1973; 1980.

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.

Meek, Clinton Roscoe, Professor, *Emeritus*, Ph.D., George Peabody College for Teachers, 1954; 1957.

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., Assistant Professor, Ph.D., Kent State University, 1980; 1980.

Renzaglia, Guy A., Professor, *Emeritus*, Ph.D., University of Minnesota, 1952; 1955.

Snowman, Jack, Associate Professor, Ph.D., Indiana University, 1975; 1975.

White, Gordon, Assistant Professor, Ph.D., University of Iowa, 1969; 1971.

Woehlke, Paula L., Associate Professor, Ph.D., Arizona State University, 1973; 1973.

Yates, J. W., Professor, Ed.D., University of Missouri-Columbia, 1951; 1964.

Electrical Engineering

COLLEGE OF ENGINEERING AND TECHNOLOGY

Botros, Nazeih M., Assistant Professor, Ph.D., University of Oklahoma, 1985; 1985.

Digital hardware design and signal analysis.

Brown, David P., Professor, Ph.D., Michigan State University, 1961; 1983.

Circuit and system theory, network analysis and synthesis.

Daneshdoost, Morteza, Assistant Professor, Ph.D., Drexel University, 1984; 1984.

Power systems, expert systems, control.

Dhali, Shirshak K., Assistant Professor, Ph.D., Texas Tech University, 1984; 1984.

Geos electronics, plasma processing, solid state.

Feiste, Vernold, K., Associate Professor and *Acting Chair*, Ph.D., University of Missouri-Columbia, 1966; 1966.

Power system analysis, energy conversion.

Goben, Charles A., Professor, Ph.D., Iowa State University, 1965; 1980.

Solid state electronics and materials, surface electromagnetic waves.

Gupta, Lalit, Assistant Professor, Ph.D., Southern Methodist University, 1986; 1986.

Computer vision, pattern recognition, digital signal processing, digital system design.

Han, Jia-Yuan, Assistant Professor, Ph.D., Ohio State University, 1985; 1986.

Robotic multiprocessor system design (software and hardware), computer architecture, computer networks, control systems, CAD/CAM.

Hu, Chia-Lun John, Associate Professor, Ph.D., University of Colorado, 1966; 1981.

Microwave measurement, bioengineering, electrophysics, air pollution.

Manzoul, Mahmoud A., Assistant Professor

or, Ph.D., West Virginia University, 1985; 1985. Computer systems and applications, computer architecture, special purpose computer, parallel and array processing.

Fourboghlat, Farzad, Assistant Professor, Ph.D., University of Iowa, 1984; 1984. Nonlinear, robust and adaptive control robotics.

Lawlings, Charles A., Associate Professor, Ph.D., Southern Illinois University at Carbondale, 1974; 1964. Biomedical engineering, instrumentation.

Mayeh, Mohammad R., Assistant Professor, Ph.D., Oklahoma State University, 1985; 1986. Random signal analysis, electro-optics, digital signal processing, microcomputer system design.

Smith, James G., Professor, Ph.D., University of Missouri-Rolla, 1967; 1966. Electromagnetics, microwaves.

Stomopoulos, Stelios C. A., Assistant Professor, Ph.D., State University of New York at Buffalo, 1983; 1983. Computer networks, detection, artificial vision, robotics.

Siswanathan, Ramanarayanan, Assistant Professor, Ph.D., Southern Methodist University, 1983; 1983. Detection and estimation, 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.

Bernhardt, Stephen A., Assistant Professor, Ph.D., University of Michigan, 1981; 1981.

Brown, William J., Associate Professor, Ph.D., Duke University, 1966; 1966.

John, Alan Martin, Professor, Morris Library, M.S., University of Illinois, 1955; 1955.

Moelman, E. C., Professor, *Emeritus*, Ph.D., University of Illinois 1936; 1946.

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, Ph.D., University of Connecticut, 1965; 1965.

Hatton, Thomas J., Associate Professor, Ph.D., University of Nebraska, 1966; 1965.

Illegas, Mark, Professor, *Emeritus*, Ph.D., Columbia University, 1957; 1965.

Jowell, John M., Professor, Ph.D., Tulane University, 1963; 1963.

Murley, Paul J., Professor, Ph.D., Duke University, 1962; 1965.

Ones, Rodney G., Associate Professor, M.F.A., University of North Carolina at Greensboro, 1973; 1984.

Reifer, Daniel R., Assistant Professor, Ph.D., Yale University, 1985; 1983.

Trappe, Edith S., Associate Professor,

Emerita, Ph.D., University of Pennsylvania, 1953; 1929.

Kvernes, David M., Assistant Professor and Director of General Education in English, 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, Ph.D., Syracuse University, 1953; 1979.

Little, Judy R., Professor, Ph.D., University of Nebraska, 1969; 1969.

Miller, Thomas P., Assistant Professor, Ph.D., University of Texas at Austin, 1984; 1984.

Moss, Sidney P., Professor, *Emeritus*, Ph.D., University of Illinois, 1954; 1964.

Partlow, Robert B., Jr., Professor, *Emeritus*, Ph.D., Harvard University, 1955; 1957.

Peterson, Richard F., Professor and Chair, Ph.D., Kent State University, 1969; 1969.

Piper, Henry Dan, Professor, Ph.D., University of Pennsylvania, 1950; 1962.

Rainbow, R.S., Associate Professor, Ph.D., University of Chicago, 1959; 1949.

Rudnick, Hans H., Professor, Ph.D., University of Freiburg, Germany, 1966; 1966.

Russo, James Richard, Assistant 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.

Smith, Gary, Assistant Professor, Ph.D., Stanford University 1981; 1981.

Stibitz, E. Earle, Professor, *Emeritus*, Ph.D., University of Michigan, 1951; 1952.

Vieth, David Muench, Professor, Ph.D., Yale University, 1953; 1965.

Webb, Howard W., Jr., Professor, Ph.D., University of Iowa, 1953; 1956.

Finance

COLLEGE OF BUSINESS AND ADMINISTRATION

Davids, Lewis E., Professor, *Emeritus*, Ph.D., New York University, 1949; 1978. Financial institutions and banking.

Elsaid, Hussein H., Professor, Ph.D., University of Illinois, 1968; 1967. International finance and financial management.

Jose, Manuel L., Assistant Professor, Ph.D., Virginia Polytechnic Institute, 1983; 1983. Corporate finance and financial institutions.

Mathur, Iqbal, Professor and Chair, Ph.D., University of Cincinnati, 1974; 1977. Financial management and investments.

Rangan, Nanda, Assistant Professor, Ph.D., Texas A & M University, 1986; 1986. Financial institutions.

Stevens, Jerry L., Assistant Professor, Ph.D., University of Illinois, 1980; 1983. Corporate finance.

Tyler, R. Stanley, Associate Professor, J.D., University of Illinois, 1952; 1970. Business law, legal environment of business and real estate.

Unal, Haluk, Assistant Professor, Ph.D.,

Ohio State University, 1985; 1985. Financial institutions.

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.

Childs, Margaret H., Assistant Professor, Ph.D., University of Pennsylvania, 1983; 1983.

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, Ph.D., University of Missouri-Columbia, 1961; 1967.

Liedloff, Helmut, Professor and *Chair*, Ph.D., Phillips University, Germany, 1956; 1959.

McBride, Charles, Associate Professor, Ph.D., University of Texas, 1968; 1972.

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, Ph.D., Universitas Ucrainiensis Libera, Munich, Germany, 1967; 1970.

Speck, Charles, Assistant Professor, Laurea in Diritto Canonico, Pontifical Lateran University, Italy, 1963; 1970.

Tai, James, Associate Professor, Ph.D., Indiana University, 1970; 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, Assistant Professor, Ph.D., Cornell, 1976; 1977.

Winters, Margaret, Associate Professor, Ph.D., University of Pennsylvania, 1975; 1977.

Woodbridge, Hensley, Professor, Ph.D., University of Illinois, 1950; 1965.

Forestry

SCHOOL OF AGRICULTURE

Aubertin, Gerald M., Associate Professor,

Ph.D., Pennsylvania State University, 1967.

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.

Childman, 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, Ph.D., Ohio State University, 1964; 1965.

Myers, Charles C., Associate Professor, Ph.D., Purdue University, 1966; 1973.

Roth, Paul L., Professor, Ph.D., Kansas State University, 1968; 1967.

Weaver, George T., Professor and *Chair*, Ph.D., University of Tennessee, 1972; 1970.

Yambert, Paul A., Professor, Ph.D., University of Michigan, 1961; 1969.

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. Doyme, 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, Ph.D., Pennsylvania State University, 1960; 1965.

Krause, Annemarie, Associate Professor, *Emerita*, Ph.D., University of Chicago, 1951; 1930.

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

Crelling, John C., Associate Professor, Ph.D., The Pennsylvania State University, 1973; 1977. Coal petrology, coal geology, coal utilization.

Dutcher, Russell R., Professor and *Dean* of the College of Science, Ph.D., The Pennsylvania State University, 1960; 1970. Coal geology, field geology, coal petrology.

Esling, Steven P., Assistant Professor,

D., University of Iowa, 1984; 1982. Quaternary stratigraphy; hydrogeology; geomathematics.

ifarek, Richard H., Assistant Professor, D.H.S., Oregon State University, 1985; 1985. Economic geology, stable isotope geochemistry; fluid inclusion studies.

Frank, Charles, O., Assistant Professor, D.H.S., Syracuse University, 1973; 1970. Metamorphic petrology, igneous petrology.

Fraunfelder, George H., Professor, Ph.D., University of Missouri-Columbia, 1964; 1965. Stratigraphy, invertebrate paleontology, micropaleontology, field geology.

Guillemette, Renald, Assistant Professor, D.H.S., Stanford University, 1983; 1982. Geochemistry; mineralogy; geothermal systems.

Harris, Stanley, E., Jr., Professor, *Emeritus*, Ph.D., University of Iowa, 1947; 1949. Environmental geology, stratigraphy, Pleistocene geology.

Hobling, John L., Associate Professor, D.H.S., Pennsylvania State University, 1974; 1985. Coal resource evaluation; coal petrology; organic petrology of source rocks.

Lochell, R. Craig, Assistant Professor, D.H.S., University of Texas, 1980; 1984. Fluvial/coastal geomorphology; environmental/engineering geology; planetary geology; paleohydrology.

Malinconico, Lawrence L., Jr., Assistant Professor, Ph.D., Dartmouth College, 1982; 1982. Applied geophysics, volcanology, tectonics, remote sensing.

Marzolf, John E., Associate Professor, D.H.S., The University of California, Los Angeles, 1970; 1982. Clastic sedimentology, clastic petrology.

Mitter, Dale F., Professor, Ph.D., Princeton University, 1964; 1972. Geomorphology, fluvio-geomorphology; Pleistocene geology.

Robinson, Paul D., Associate Geologist, D.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.

Stgaard, John E., Professor and *Chair*, D.H.S., Indiana University, 1963; 1965. Invertebrate paleontology, paleoecology; environments of deposition, carbonate petrology.

Simmerman, Jay, Jr., Professor, Ph.D., Princeton University, 1968; 1973. Structural geology, rock deformation, alpine-type ultramafics.

Health Education

COLLEGE OF EDUCATION

Caron, James E., Professor, Ed.D., New York University, 1960; 1957. Driver performance, alcohol and highway safety, traffic safety management, accident prevention principles.

Coydston, Donald N., Professor and *Chair*, D.D., Columbia University, 1949; 1955. Teacher education and preparation, content area instruction.

Bridges, A. Frank, Professor, *Emeritus*, D.H.S., Indiana University, 1952; 1947.

Casey, Ralph, Associate Professor, *Emeritus*, Ed.D., Columbia University, 1956; 1957. Research design, community health program evaluation.

Denny, Florence E., Associate Professor, *Emerita*, M.A., Columbia University, 1935; 1929.

Drolet, Judy C., Assistant Professor, Ph.D., University of Oregon, 1982; 1983. Personal health, human sexuality, sex education, drug education, gerontology, health education and computers, wellness, nutrition, death education.

Duncan, David, Professor, Dr.P.H., Health Science Center, University of Texas at Houston, 1977; 1978. Content area-related research, epidemiology, community health program evaluation.

Grisson, Deward K., Professor, *Emeritus*, Ed.D., Columbia University, 1952; 1956.

LeFevre, John R., Professor, Ed.D., Teachers College, Columbia University, 1950; 1955. Sex education, school health education.

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.

Ritzel, Dale, Professor, Ph.D., Southern Illinois University at Carbondale, 1970; 1966. Safety education injury control, research design, driving simulation, community safety.

Russell, Robert D., Professor, Ed.D., Stanford University, 1954; 1965. Ecological perspectives, education about mood modifying substances and sexuality, death education, innovative approaches in health education.

Sarvela, Paul D., Assistant Professor, Ph.D., University of Michigan, 1984; 1986. Program evaluation, community health, computer assisted instruction.

Sliepcevich, Elena M., Professor, D.P.E., Springfield College, 1955; 1973. Curriculum theory, professional preparation, bioethics, futurism.

Zunich, Eileen M., Assistant Professor, Ph.D., Southern Illinois University at Carbondale, 1970; 1967. Teacher education and preparation, school and college health program development, content area instruction.

History

COLLEGE OF SCIENCE

Allen, Howard W., Professor and *Chair*, Ph.D., University of Washington, 1959; 1962. United States: recent.

Ammon, Harry, Professor, *Emeritus*, Ph.D., University of Virginia, 1948; 1950. United States: early national.

Barton, H. Arnold, Professor, Ph.D., Princeton University, 1962; 1970. European: 18th century and French; Scandinavia.

Batinski, Michael C., Assistant Professor,

Ph.D., Northwestern University, 1969; 1968. United States: Colonial.

Brehm, Donald L., Assistant Professor, Ph.D., St. Louis University, 1968; 1967. European: Medieval; Spain.

Carrott, M. Browning, Associate Professor, Ph.D., Northwestern University, 1966; 1967. United States: constitutional.

Cashin, Joan E., Assistant Professor, Ph.D., Harvard University, 1985; 1985. U.S. and early American history.

Conrad, David E., Professor, Ph.D., University of Oklahoma, 1962; 1967. United States: economic, recent; American Indian.

Detwiler, Donald S., Professor, Dr. Phil., Goettingen University, Germany, 1961; 1967. European: diplomatic; Germany.

Dotson, John E., Assistant Professor, Ph.D., Johns Hopkins University, 1969; 1970. European: Renaissance, economic. Italy.

Fladeland, Betty L., Professor, *Emerita*, Ph.D., University of Michigan, 1952; 1962. United States: middle period.

Gardiner, C. Harvey, Professor, *Emeritus*, Ph.D., University of Michigan, 1945; 1957. Latin American.

Gold, Robert L., Professor, Ph.D., University of Iowa, 1964; 1965. Latin American: Mexico, Caribbean, U.S. Borderlands.

Hallssey, Robert C., Adjunct Associate Professor, Ph.D., University of Missouri, 1973; 1976. British: Imperialism; Asia.

Kuo, Ping-Chia, Professor, *Emeritus*, Ph.D., Harvard University, 1933; 1959. East Asian.

Murphy, James B., Associate Professor, Ph.D., Louisiana State University, 1968; 1968. United States: southern.

O'Day, Edward J., Assistant Professor, A.M., Indiana University, 1956; 1962. European: 20th Century; East-central.

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. Civil War and reconstruction, Illinois.

Vyverberg, Henry S., Professor, Ph.D., Harvard University, 1950; 1968. European: intellectual.

Werlich, David P., Professor, Ph.D., University of Minnesota, 1968; 1968. Latin American: South American; Andean; Peruvian.

Wilson, David, Adjunct Associate Professor, Ph.D., University of Tennessee, 1974; 1974.

Wright, John I., Associate Professor, *Emeritus*, A.M., University of Chicago, 1933; 1925.

Wu, Tien-Wei, Professor, Ph.D., University of Maryland, 1965; 1972. Asian: East Asia; China.

Zucker, Stanley, Professor and Graduate Adviser, Ph.D., University of Wisconsin, 1968; 1967. European: Social; Germany.

Journalism

COLLEGE OF COMMUNICATIONS AND FINE ARTS

Atwood, L. Erwin, Professor, Ph.D., University of Iowa, 1965; 1967. Communication

theory, behavioral research methods, international communication.

Brown, George C., Professor, Ph.D., Southern Illinois University at Carbondale, 1968; 1956. Media management, media history, graphics, photography.

Ford, James L. C., Professor, *Emeritus*, Ph.D., University of Minnesota, 1948; 1955.

Gruny, C. Richard, Assistant Professor, J.D., University of Illinois, 1959; 1959. Media law.

Long, Howard R., Professor, *Emeritus*, Ph.D., University of Missouri, 1948; 1953.

McCoy, Ralph E., Professor, *Emeritus*, Ph.D., University of Illinois, 1956; 1955.

McKerns, Joseph, Associate Professor, Ph.D., University of Minnesota, 1979; 1981. Mass communication history, mass media and society.

Nevious, William A., Assistant Professor, Ph.D., Southern Illinois University at Carbondale, 1987; 1984. Advertising.

Ramaprasad, Jyotika, Assistant Professor, Ph.D., Southern Illinois University at Carbondale, 1983; 1986. Magazine design and production, graphics, international communication.

Rice, W. Manion, Associate Professor at *Acting Director*, Ph.D., Southern Illinois University at Carbondale, 1967; 1959. Communication journalism, scholastic journalism, media history.

Spellman, Robert, Assistant Professor, J.D., Cleveland State University, 1977; 1981. Mass media law, legal research, reporting.

Stonecipher, Harry W., Professor, *Emeritus*, Ph.D., Southern Illinois University at Carbondale, 1971; 1969. Mass media law, legal research, editorial and critical writing.

Whitby, Gary, Assistant Professor, Ph.D., University of Iowa, 1984; 1984. Mass media history, reporting, magazine writing.

Library Affairs

Bauner, Ruth E., Associate Professor, Ph.D., Southern Illinois University at Carbondale, 1978; 1956.

Bedient, Douglas, Associate Professor, Ph.D., Southern Illinois University at Carbondale, 1971; 1971.

Black, George W., Jr., Professor, M.S.L.S., Columbia University, 1966; 1968.

Boydston, JoAnn, Professor, Ph.D., Columbia University, 1950; 1955.

Cohn, Alan M., Professor, M.S., University of Illinois, 1955; 1955.

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

h.D., Southern Illinois University at Carbondale, 1982; 1970.

eterson, Kenneth G., Professor and *Dean*, h.D., University of California, Berkeley, 1968; 1976.

imon, John Y., Professor, Ph.D., Harvard University, 1961; 1964.

tubbs, Walter R., Assistant Professor, h.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.

arrell, Patricia L., Professor, Ph.D., University of Texas at Austin, 1966; 1968. Psycholinguistics, first and second language acquisition, pragmatics, theoretical and applied syntax, semantics.

Hilbert, Glenn G., Professor, Ph.D., Harvard University, 1963; 1970. Pidgin and creole languages, sociolinguistics, dialectolog language acquisition, Germanic languages.

Hill, Beverly G., Assistant Professor, Ph.D., University of Texas at Austin, 1972; 1969. Sex differences in language, composition, historical linguistics.

Nathan, Geoffrey S., Assistant Professor, Ph.D., University of Hawaii, 1978; 1980. Phonology, syntax, historical linguistics, phonetics, acoustic phonetics, child language acquisition, ESL methodology.

Nguyen, Dinh-Hoa, Professor, Ph.D., New York University, 1956; 1969. EFL/ESL, linguistics, lexicography, language planning, Vietnamese, Chinese, French.

Parish, Charles, Professor, Ph.D., University of New Mexico, 1959; 1965. EFL/ESL, pedagogy and methodology, innovative methods, syllabus design, Italian.

Perkins, Allan K., Associate 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.

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. Management and communications.

Gardner, William L., Assistant Professor, D.B.A., Florida State University, 1983; 1984. Organizational behavior, leadership, learned helplessness, impression management, managerial work.

Gutteridge, Thomas G., Professor and *Dean*, Ph.D., Purdue University, 1971; 1983. Labor relations, personnel administration, and career development.

Kraft, Kenneth L., Assistant Professor, D.B.A., University of Maryland, 1982; 1982. Strategic management and organization theory.

Larson, Lars L., Associate Professor, Ph.D., University of Illinois, 1971; 1971. Organizational behavior and business policy.

Martin, Thomas N., Associate Professor, Ph.D., University of Iowa, 1977; 1977. Management theory, organizational behavior, and research methods.

Ramaprasad, Arkalgud, Associate Professor, Ph.D., University of Pittsburgh, 1980; 1980. Strategic management, management information systems.

Rehn, Henry J., Professor, *Emeritus*, Ph.D., University of Chicago, 1930; 1945.

Schermerhorn, John R., Professor, Ph.D., Northwestern University, 1974; 1979. Organizational theory and behavior, organizational change, and interorganizational relations.

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.

Snodgrass, Coral R., Assistant Professor, Ph.D., University of Pittsburgh, 1984; 1984. Business policy.

Szewczak, Edward J., Assistant Professor, Ph.D., University of Pittsburgh, 1985; 1984. Management information systems and management support systems.

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. Retailing 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, Assistant Professor, Ph.D., North Texas State University, 1983; 1984. Consumer decision making and promotion management.

Dommermuth, William P., Professor, *Emeritus*, Ph.D., Northwestern University, 1964; 1968. Promotion, marketing research, and consumer behavior.

Hensel, Paul J., Associate Professor, Ph.D., University of Houston, 1981; 1986. Marketing ethics and consumer behavior.

Hindersman, Charles H., Professor, D.B.A., Indiana University, 1959; 1960. Marketing management, business and society, and sales management.

Moore, James R., Assistant Professor, Ph.D., University of Illinois, 1972; 1969. Marketing management, sales management, and marketing channels.

Perry, Donald L., Associate Professor, Ph.D., University of Illinois, 1966; 1964. Social marketing, sales management.

Summey, John H., Associate Professor, D.B.A., 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, geometry, and topology.

Burton, Theodore A., Professor, Ph.D., Washington State University, 1964; 1966. Differential and integral equations.

Carlson, Dean A., Assistant Professor, Ph.D., University of Delaware, 1983; 1985. Optimization, calculus of variations, and differential equations.

Crenshaw, James A., Associate Professor, Ph.D., University of Illinois, 1967; 1967. Analysis, operations research.

Danhof, Kenneth, Professor, Ph.D., Purdue University, 1969; 1969. Logic, combinatorics.

Dharmadhikari, Sudhakar, Professor, Ph.D., University of California, Berkeley, 1962; 1978. Statistics, probability.

Earnest, Andrew, Associate Professor, Ph.D., Ohio State University, 1975; 1981. Algebra, algebraic number theory.

Feinsilver, Philip, Associate Professor,

Ph.D., New York University, 1975; 1978. Probability, representation theory.

Fitzgerald, Robert W., Associate Professor, Ph.D., University of California-Los Angeles, 1980; 1982. Algebra.

Foland, Neal E., Professor, Ph.D., University of Missouri, 1961; 1965. Topology, topological dynamics.

Gates, Leslie D., Associate Professor, Ph.D., Iowa State University, 1952; 1961. Numerical analysis.

Greene, John, Assistant Professor, Ph.D., University of Minnesota, 1984; 1984. Combinatorics and algebra.

Gregory, John, Professor, Ph.D., University of California, Los Angeles, 1970; 1972. Numerical analysis, optimization.

Grimmer, Ronald C., Professor, Ph.D., University of Iowa, 1967; 1967. Integral and differential equations.

Hooker, John W., Associate Professor, Ph.D., University of Oklahoma, 1967; 1967. Ordinary differential equations.

Hunsaker, Worthen N., Associate Professor, Ph.D., Washington State University, 1966; 1969. Topology.

Jeyaratnam, Sakthivel, Assistant Professor, Ph.D., Colorado State University, 1971; 1981. Mathematics and statistics.

Kammler, David, Professor, Ph.D., University of Michigan, 1971; 1971. Numerical analysis.

Kirk, Ronald B., Professor, Ph.D., California Institute of Technology, 1968; 1968. Analysis, probability.

Koch, Charles, Assistant Professor, Ph.D., University of Illinois, 1961; 1966. Summability theory.

Kuipers, Lauwerens, Professor, *Emeritus*, Ph.D., Vrije Universiteit (Amsterdam), 1947; 1966.

Langenhop, Carl E., Professor, Ph.D., Iowa State University, 1948; 1961. Differential equations, matrix theory.

Mark, Abraham M., Professor, *Emeritus*, Ph.D., Cornell University, 1947; 1950. Numerical analysis.

Maxwell, Charles, Professor, Ph.D., University of Illinois, 1955; 1963. Algebraic topology.

McDaniel, Wilbur C., Professor, *Emeritus*, Ph.D., University of Wisconsin, 1939; 1939.

Milman, Mario, Associate Professor, Ph.D., Australian National University, 1978; 1982. Harmonic analysis, interpolation theory, martingales.

Mohammed, Salah E. A., Associate Professor, Ph.D., University of Warwick, England, 1976; 1984. Global analysis, qualitative theory of functional differential equations (on manifolds), theory of stochastic ordinary and functional differential equations.

Moore, Robert A., Associate Professor, Ph.D., Indiana University, 1961; 1965. Algebra.

Mulrow, Edward J., Assistant Professor, Ph.D., Colorado State University, 1986; 1986. Probability and statistics.

Neuman, Edward, Associate Professor, Ph.D., University of Wroclaw, 1972; 1984.

numerical analysis, approximation theory, and spline functions.

Imsted, John M. H., Professor, *Emeritus*, Ph.D., Princeton University, 1940; 1960.

Jaine, Thomas B., Assistant Professor, Ph.D., University of Oregon, 1966; 1966. Statistics, probability.

Janchapakesan, S., Professor, Ph.D., Purdue University, 1969; 1970. Statistics.

Marker, George D., Associate Professor, Ph.D., University of California, San Diego, 1971; 1972. Differential geometry.

Matula, William T., Associate Professor, Ph.D., Carnegie-Mellon University, 1971; 1972. Ordinary differential equations, difference equations.

Nedersen, Franklin D., Associate Professor, Ph.D., Tulane University, 1967; 1965. Algebra-lattice ordered groups.

Nedersen, Katherine, Associate Professor, Ph.D., Tulane University, 1969; 1965. Mathematics education, topology.

Nerick-Spector, Kathleen A., Assistant Professor, Ph.D., Carnegie-Mellon University, 1980; 1981. Partial differential equations, ordinary differential equations, continuum mechanics, and fluid dynamics.

Nedmond, Donald, Associate Professor, Ph.D., University of Illinois, 1976; 1979. Number theory.

Nekalsky, Michael, Professor, *Emeritus*, Ph.D., Nat.Sc., University of Göttingen, 1949; 1957. Probability, stochastic processes.

Neyder, Herbert H., Professor, Ph.D., Lehigh University, 1965; Ph.D., University of South Africa, 1971; 1966. Applied mathematics.

Nector, Scott J., Associate Professor, Ph.D., Carnegie-Mellon University, 1978; 1981. Partial differential equations.

Nellis, Walter D., Professor, Ph.D., University of Sydney, 1968; 1985. Combinatorics, graph theory, programming languages, and cryptography.

Nellis, Daniel G., Assistant Professor, Ph.D., University of Iowa, 1986; 1986. Numerical analysis and applied mathematics.

Nelson, Joseph C., Professor, *Emeritus*, Ph.D., Louisiana State University, 1954; 1957. Algebra.

Night, Mary H., Assistant Professor, Ph.D., McGill University, Montreal, Quebec, 1977; 1980. Calculus, real and complex analysis, finite mathematics, topology, and algebra.

Nucas, Joseph, Associate Professor, Ph.D., Pennsylvania State University, 1978; 1980. Algebra; number theory; quadratic forms.

Neman, Marvin, Associate Professor, Ph.D., New York University, 1974; 1979. Partial differential equations.

Mechanical Engineering and Energy Processes

COLLEGE OF ENGINEERING AND TECHNOLOGY

Rowner, William E., Jr., Professor, Ph.D., Massachusetts Institute of Technology, 1969; 1976. Material science, solidification.

Chen, Juh W., Professor, Ph.D., University of Illinois, 1959; 1965. Coal conversion processes, supercritical extraction.

Don, Jarlen, Assistant Professor, Ph.D., Ohio State University, 1982; 1985. Material science, physical metallurgy, x-ray and electron diffraction.

Helmer, Wayne A., Associate Professor, Ph.D., Purdue University, 1974; 1974. Heat transfer in two-phase flow, solar drying, heat storage.

Hesketh, Howard E., Professor, Ph.D., Pennsylvania State University, 1968; 1968. Air pollution control, atomization, sorption processes, fluidization engineering, control of sulfur dioxide and particulates, evaluation and control of odors.

Hippo, Edwin J., Associate Professor, Ph.D., Pennsylvania State University, 1977; 1984. Coal conversion and materials.

Jefferson, Thomas B., Professor, Ph.D., Purdue University, 1955; 1969. Thermodynamics, heat transfer.

Kent, Albert C., Professor and *Chair*, Ph.D., Kansas State University, 1968; 1966. Heat transfer, thermal environmental control, coal fines utilization, solar application.

Lalvani, Shashi, Assistant Professor, Ph.D., University of Connecticut, 1982; 1982. Electrochemical processes, chemical kinetics.

Muchmore, Charles B., Associate Professor, Ph.D., Southern Illinois University at Carbondale, 1970; 1966. Biological, physical and chemical aspects of water quality control, mass transfer operations, desulfurization of coal, coal processing.

O'Brien, William S., Assistant Professor, Ph.D., West Virginia University, 1972; 1973. Acid mine waste treatment, coal conversion processes, coal desulfurization and pyrolysis.

Orthwein, William, Professor, Ph.D., University of Michigan, 1959; 1965. Machine design, vibrations, theoretical and experimental stress analysis.

Rajan, Suryanarayaniah, Associate Professor, Ph.D., University of Illinois, 1970; 1977. Energy utilization, mixed fuels, fluidized-bed combustion.

Swisher, James H., Professor, Ph.D., Carnegie-Mellon, 1963; 1983. Metallurgy and materials science.

Tempelmeyer, Kenneth E., Professor and *Dean*, Ph.D., University of Tennessee, 1969; 1979. Energy conversion, heat and mass transfer, magnetic hydrodynamics.

Wapner, Philip G., Associate Professor, Ph.D., University of Pennsylvania, 1970; 1983. Carbon-based materials, coal gas cleaning.

Wittmer, Dale E., Associate Professor, Ph.D., University of Illinois, 1980; 1986. Ceramics.

Microbiology

COLLEGE OF SCIENCE

Borgia, Peter, Associate Professor, Ph.D., (Springfield), University of Illinois, 1973; 1976.

Brewer, Gregory J., Associate Professor, (Springfield), University of California, San Diego, 1972; 1980.

Caster, John, Assistant Professor, Ph.D., St. Louis University, 1968; 1972.

Clark, David P., Assistant Professor, Ph.D., University of Bristol, 1977; 1980.

Cooper, Morris D., Associate Professor, Ph.D., (Springfield), University of Georgia, 1971; 1973.

Jackson, Robert W., Professor, Ph.D., (Springfield), Purdue University, 1963; 1974.

Lindegren, Carl C., Professor, *Emeritus*, Ph.D., California Institute of Technology, 1931; 1947.

Madigan, Mike, 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., Assistant 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 M., Associate 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

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.

Sevim, Hasan, Assistant 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.

Sweigard, Richard, Assistant Professor, Ph.D., The Pennsylvania State University, 1984; 1985. Surface mining, postmining land use, reclamation planning, mine cost analysis.

Molecular Science

DEPARTMENTAL AFFILIATION OF INTERDISCIPLINARY PROGRAM

Bolen, D. Wayne, Professor, Ph.D., (Chemistry and Biochemistry).

Bose, Subir K., Professor, Ph.D., (Physics and Astronomy).

Brower, William E. Jr., Associate Professor, Ph.D., (Civil Engineering and Mechanics).

Burton, Theodore A., Professor, Ph.D. (Mathematics).

Chavez, D., Associate Professor, (School of Medicine).

Chen, Juh Wah, Professor, Ph.D., (Mechanical Engineering and Engineering Processes).

Coulson, Richard L., Associate Professor, Ph.D., (Physiology).

Cutnell, John D., Associate Professor, Ph.D., (Physics and Astronomy).

Dhali, Shirshak, Assistant Professor, Ph.D. (Electrical Engineering).

Dunkerton, Lois, Associate Professor, (Chemistry and Biochemistry).

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 and Astronomy).

Hadler, Herbert I., Professor, Ph.D., (Chemistry and Biochemistry).

Henneberger, Walter C., Professor, Ph.D. (Physics and Astronomy).

Hinckley, Conrad C., Professor, Ph.D. (Chemistry and Biochemistry).

Hu, Chia L. J., Associate Professor, Ph.D. (Electrical Engineering).

Hunter, William S., Associate Professor, Ph.D., (Physiology).

Johnson, Kenneth W., Associate Professor, Ph.D., (Physics and Astronomy).

Kammler, David W., Professor, Ph.D. (Mathematics).

Kent, Albert C., Associate Professor, Ph.D. (Mechanical Engineering and Engineering Processes).

Koster, David F., Associate Professor, Ph.D., (Chemistry and Biochemistry).

Malhotra, Vivak, Assistant Professor, Ph.D., (Physics and Astronomy).

Malik, F. Bary, Professor, Ph.D., (Physics and Astronomy).

Masden, Joseph, Assistant Professor, Ph.D. (Physics and Astronomy).

Meyers, Cal Y., Professor, Ph.D., (Chemistry and Biochemistry).

Muchmore, C., Professor, (Civil Engineering and Mechanics).

O'Brien, William S., Assistant Professor, Ph.D., (Mechanical Engineering and Engineering Processes).

Laparo, Anthony A., Associate Professor, h.D., (Zoology).
Lajan, S., Associate Professor, (Mechanical Engineering and Engineering Processes).
Lami, Sedat, Professor, Ph.D., (Civil Engineering and Mechanics).
Landers, Frank C. Jr., Associate Professor, h.D., (Physics and Astronomy).
Laproschenko, Mykola, Professor, Ph.D., (Physics and Astronomy).
Lechner, Stephen, Associate Professor, h.D., (Chemistry and Biochemistry).
Linha, Atmesh K., Associate Professor, h.D., (Mechanical Engineering and Engineering Processes).
Lith, James G., Professor, Ph.D., (Electrical Engineering).
Lith, Gerard V., Professor and *Director*, h.D., (Molecular Science and Chemistry and Biochemistry).
Lnyder, Herbert H., Professor, (Mathematics).
Homopoulos, Stelios, Assistant Professor, h.D., (Electrical Engineering).
Lyrrell, James, Professor, Ph.D., (Chemistry and Biochemistry).
Liswanathan, Ramanarayanan, Assistant Professor, Ph.D., (Electrical Engineering).
Lopp, John H., Professor, Ph.D., (Botany).
Litter, Robert N., Professor, Ph.D., (Physics and Astronomy).

Music

COLLEGE OF COMMUNICATIONS AND FINE ARTS

Larta, Michael, Associate Professor, M.Mus., Liszt Academy Conservatory, 1975; 1985. Violin.
Larwick, Steven, Professor, Ph.D., Harvard University, 1949; 1955. Piano, musicology.
Lateman, Marianne Webb, Professor, M.Mus., University of Michigan, 1959; 1965. Organ, music theory.
Leattie, Donald, Assistant Professor, M.Mus., University of Colorado, 1977; 1979. Class piano, piano pedagogy.
Leest, Richard, Professor, Metropolitan Opera School, 1968; 1984. Voice.
Lottje, Will Gay, Professor, *Emeritus*, M.Mus.D., Eastman School of Music, 1955; 1957.
Lreznikar, Joseph, Associate Professor, M.Mus., University of Akron, 1977; 1980. Classical guitar.
Ligel, Charles, Associate Professor, M.Mus., University of Kentucky, 1966; 1976. Bassoon, music literature.
Lizzell, Mary Jane, Assistant Professor, *Emerita*, M.Mus., Eastman School of Music, 1943; 1959.
Lammond, William, Associate Professor, h.D., Boston University, 1976; 1983. French horn.
Lanes, Michael D., Associate Professor, M.Mus., Southern Illinois University at Carbondale, 1965; 1970. Bands, musical theater, percussion.
Louse, 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.
Kingsbury, Robert, Associate Professor, *Emeritus*, M.Mus., Northwestern University, 1952; 1961.
LeGault, Maurice, Associate Professor, Ph.D., University of Minnesota, 1969; 1984. Music education.
Mandat, Eric, Assistant Professor, D.M.A., Eastman School of Music, 1986; 1981. Clarinet, composition.
McHugh, Catherine, Professor, *Emerita*, Ed.D., Columbia University, 1959; 1969. Music education.
Mellado, Daniel, Associate Professor, Ph.D., Michigan State University, 1979; 1979. Cello.
Miller, Harold, Assistant Professor, M.Mus., Wisconsin Conservatory of Music, 1981; 1984. Jazz, string bass.
Mochnick, John, Associate Professor, D.M.A., University of Cincinnati, 1978, 1984. Choral.
Mueller, Robert, Professor, Ph.D., Indiana University, 1964; 1948. Piano, music theory.
Olsson, Phillip, Professor, *Emeritus*, M.Mus., Chicago Conservatory, 1949; 1949.
Poulos, Helen, Associate Professor, D.M., Indiana University, 1971; 1969. Violin, musicology.
Resnick, Robert, Professor, *Emeritus*, M.Mus., Wichita State University, 1949; 1949.
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, Assistant Professor, Ph.D., University of California, 1981; 1983. Composition.
Taylor, Charles, Associate Professor, Ed.D., Columbia University, 1950; 1957. Music education.
Tomasz, Melanie, Assistant Professor, M.Mus., Northwestern University, 1973; 1983. Voice.
Underwood, Jervis, Professor, Ph.D., North Texas State University, 1970; 1971. Flute, musicology.
Weiss, Robert, Associate Professor, Ph.D., Southern Illinois University at Carbondale, 1984; 1978. Music education, trombone.
Werner, Kent, Associate Professor, Ph.D., University of Iowa, 1966; 1963. Piano, music theory.
Wharton, John, Associate Professor, *Emeritus*, M.Mus., American Conservatory, 1940; 1945.

Philosophy

COLLEGE OF LIBERAL ARTS

Alexander, Thomas, Assistant Professor, Ph.D., Emory University, 1984; 1985. Ameri-

can 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. History of philosophy, philosophy of history, political philosophy.

Eames, Elizabeth R., Professor and Chair, Ph.D., Bryn Mawr College, 1951; 1963. Recent British philosophy, American philosophy, action theory.

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.

Hayward, John, Professor, *Emeritus*, Ph.D., University of Chicago, 1949; 1968. Philosophy of religion, aesthetics.

Howie, John, Professor, Ph.D., Boston University, 1965; 1966. Philosophy of religion, ethics, American idealism.

Kelly, Matthew J., Associate Professor, Ph.D., University of Notre Dame, 1963; 1966. Medieval philosophy, Greek philosophy, metaphysics.

King, Sallie B., Assistant Professor, Ph.D., Temple University, 1981; 1983. Asian philosophy, cross-cultural philosophy, philosophy of religion.

McClure, George T., Professor, Ph.D., Ohio State University, 1958; 1958. Epistemology, philosophy of science, aesthetics.

Moore, Willis, Professor, *Emeritus*, Ph.D., University of California, 1936; 1955.

Plochmann, George Kimball, Professor, *Emeritus*, Ph.D., University of Chicago, 1950; 1949. Metaphysics, history of philosophy, philosophy of biology.

Schedler, George, Associate 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.

Tyman, Stephen, Associate Professor, *Director of Graduate Studies*, 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.

Carroll, Peter, Assistant Professor, Ph.D., Pennsylvania State University, 1970; 1969. Exercise physiology.

Davies, Dorothy R., Professor, *Emerita*, Ed.D., University of Cincinnati, 1944; 1939.

DeVita, Paul, Assistant Professor, Ph.D.,

University of Oregon, 1986; 1986. Biomechanics. **Fischman, Mark G.**, Assistant Professor, Ph.D., The Pennsylvania State University, 1983; 1982. Motor learning.

Good, Larry, Associate Professor, Ed.D., Temple University, 1968; 1967. Kinesiology.

Knowlton, Ronald, Professor and Chair, Ph.D., University of Illinois, 1961; 1961. Exercise physiology.

Potter, Marjorie Bond, Professor, *Emerita*, Ph.D., University of Southern California, 1958; 1961.

Shea, Edward, Professor, Ph.D., New York University, 1955; 1954. Administration and curriculum.

Stotlar, John, Associate Professor, *Emeritus*, D.P.Ed., Indiana University, 1954; 1948.

Thorpe, JoAnne Lee, Professor, Ph.D., Texas Woman's University, 1964; 1958. Administration.

West, Charlotte, Professor, Ph.D., University of Wisconsin, 1969; 1957. Administration.

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.

Bose, Subir K., Professor and Chair, Ph.D., University of Allahabad, India, 1967; 1968.

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., Göttingen 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., Göttingen 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, 1981; 1986.

Nickell, William E., Professor, *Emeritus*, Ph.D., University of Iowa, 1954; 1963.

Sanders, Frank C., Jr., Associate Professor, Ph.D., University of Texas, 1968; 1969.

Saporoschenko, Mykola, Professor, Ph.D., Washington University, 1958; 1965.

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

Arenic, Steve, Assistant Professor, Ph.D.

- Springfield), University of Iowa; 1983; 1986. Pharmacology of neurotransmission; novel transmitters; neural control of cerebral circulation; control of arterial pressure regulation during aging.
- Janerjee, Chandra**, Professor, M.D., University of Calcutta, 1955, Ph.D., Medical College of Virginia, 1967; 1974. Pulmonary physiology, neonatal physiology.
- Jarke, Andrzej**, Professor and Chair, h.D., University of Kansas, 1965; 1984. Reproductive endocrinology; role of prolactin in the control of hypothalamic, pituitary and testicular function; seasonal breeding.
- Jecker, Robert E.**, Professor, M.D., (Springfield), McGill University, Canada, 1960; 1983. Neurochemistry/neuropharmacology and biochemical pharmacology.
- Jewson, Ronald A.**, Associate Professor, h.D., University of Illinois Medical Center, Chicago, 1971; 1973. Pharmacology, neuropharmacology.
- Jespary, Donald**, Associate Professor, h.D., (Springfield), New York University, 1971; 1973. Sensory physiology, neurophysiology, neuroanatomy, comparative physiology.
- Jline, William H.**, Professor, Ph.D., (Springfield), West Virginia University, 1965; 1974. Cardiovascular physiology and pathophysiology, coronary circulation, myocardial metabolism.
- Joulson, L. Richard**, Professor, Ph.D., University of Toronto, Canada, 1971; 1978. Cardiovascular physiology and pathophysiology, coronary circulation, myocardial metabolism.
- Jox, Thomas C.**, Assistant Professor, Ph.D., Arizona State University, 1979; 1982. Ion transport across epithelial tissue.
- Juri, James L.**, Assistant Professor, D.V.M., Oklahoma State University, 1979; 1982. Anesthesia in laboratory animals.
- Junagan, Tommy T.**, Professor, Ph.D., Purdue University, 1960; 1962. Physiology and biochemistry of Acanthocephala, carbohydrate metabolism, nervous system, lacunar system.
- Junaway, George**, Associate Professor, h.D., (Springfield), University of Oklahoma, 1970; 1975. Regulation of energy/metabolism during diabetes; development and aging; induction of experimental ulcers in rats.
- 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.
- Jaingold, Carl L.**, Associate Professor, h.D., (Springfield), Northwestern University, 1970; 1972. Convulsive seizure mechanisms and effects of anticonvulsants; pharmacological alterations of cerebral evoked potentials.
- Salvo, Richard E.**, Associate Professor, h.D., University of Wyoming, 1970; 1973. Steroidal control of gonadotropin secretion and immunological approaches to the study of male reproduction.
- Roote, Florence M.**, Professor, *Emerita*, h.D., University of Iowa, 1940; 1963.
- 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.
- Hoffman, Douglas W.**, Assistant Professor, Ph.D., University of Connecticut, 1979; 1984. Neuropeptides, neuropharmacology, neurobiochemistry.
- 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.
- Lee, Tony**, Associate Professor, Ph.D., (Springfield), West Virginia University, 1973; 1975. Neuromuscular transmission in cerebral blood vessels.
- Miller, Donald M.**, Professor, Ph.D., University of Illinois, 1965; 1966. Comparative physiology and ciguatera toxins.
- Myers, Hurley**, Associate 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.
- Rybak, Leonard**, Associate Professor, Ph.D., University of Minnesota, 1979; 1981. Investigation of mechanisms controlling ionic composition and resting potentials in the peripheral auditory apparatus using chinchilla model.
- Shanahan, Michael F.**, Associate Professor, Ph.D., University of Michigan, 1976; 1985. Insulin action and glucose transport across cell membranes.
- Sherman, Kathleen**, Assistant Professor, Ph.D., University of Pittsburgh, 1979; 1985. Cholinergic neuropharmacology, regulation of cholinergic mechanisms, aging, Alzheimer's disease.
- Sollberger, Arne**, Professor, M.D., Caroline Institute of Medicine and Dentistry, Sweden, 1957; 1972. Biological rhythms, biostatistics, biological systems.
- Somani, Satu**, Associate Professor, Ph.D., (Springfield), Liverpool University, England, 1969; 1976. Drug disposition.
- Steger, Richard W.**, Associate 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., Associate Professor, Ph.D., Medical College of Virginia, 1971, 1973. Gastrointestinal physiology.

Plant and Soil Science

COLLEGE OF AGRICULTURE

Chong, She-Kong, Associate Professor, Ph.D., University of Hawaii, 1979; 1979. Soil physics.

Elkins, Donald M., Professor, Ph.D., Auburn University, 1967; 1967. Field and forage crops, plant growth regulators.

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. Soil conservation, soil physics, soil and water relationships.

Kapusta, George, Professor, Ph.D., Southern Illinois University at Carbondale, 1975; 1964. Weed control and crop production.

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. Herbicides and weed control, statistics.

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.

Pennucci, Annamarie, Assistant Professor, Ph.D., University of Rhode Island, 1986; 1986. Turfgrass management and plant pathology.

Portz, Herbert L., Professor, *Emeritus*, Ph.D., University of Illinois, 1954; 1954. Field crops and turf management.

Preece, John E., Associate Professor, Ph.D., University of Minnesota, 1980; 1980. Horticultural physiologist.

Stucky, Donald J., Professor, Ph.D., Purdue University, 1963; 1970. Crop physiology, crop ecology, crop production and environmental aspects.

Starman, Terri W., Assistant Professor, Ph.D., Texas A & M University, 1986; 1986. Floriculture, post harvest physiology of ornamental crops.

Taylor, Bradley H., Assistant 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, Ph.D., Fletcher School of Law and Diplomacy, 1949; 1966. Comparative politics, international politics, Marxist theory, comparative Communism.

Clinton, Robert L., Assistant Professor, Ph.D., University of Texas, 1985; 1985. Public law, American politics.

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.

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.

Hanson, Earl Thomas, Professor, *Emeritus*, Ph.D., University of Illinois, 1948; 1960.

Hardenbergh, William, Professor, Ph.D., University of Illinois, 1954; 1960. Comparative politics, especially Britain and old Commonwealth countries, South Asia, Middle East.

Jackson, John S., III, Professor, Ph.D., Vanderbilt University, 1971; 1969. American government and politics, political parties, public opinion, state and local government.

Jacobini, Horace B., Professor, Ph.D., University of Kansas, 1951; 1957. International relations, comparative politics, jurisprudence, administrative law.

Kamarasy, Egon K., Assistant Professor, *Emeritus*, Doctor Politics, Budapest University, Hungary, 1942; 1959. Comparative politics (Europe), contemporary political ideologies, social policy, environmental protection.

Kenney, David T., Professor, *Emeritus*, Ph.D., University of Illinois, 1952; 1951. State and local politics, Illinois government and politics, executive process.

Klingberg, Frank L., Professor, *Emeritus*, Ph.D., University of Chicago, 1938; 1946. International politics.

Kosaki, Liane C., Assistant Professor, Ph.D., University of Michigan, 1984; 1984. Public law, political theory, women, and politics.

andecker, 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.

ason, 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. Public administration and American politics.

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. Political theory.

Nelson, Randall H., Professor, *Emeritus*, Ph.D., University of Michigan, 1956; 1955. American constitutional law, judicial process, and behavior, American chief executive, American politics.

aine, JoAnn P., Associate Professor, Ph.D., University of Oregon, 1967; 1966. Empirical theory, international politics, comparative politics.

Schubert, Glendon, Research Professor, Ph.D., Syracuse University, 1948; 1986. Biology and politics, political culture, political behavior.

Seroka, James H., Associate Professor, Ph.D., Michigan State University, 1976; 1979. Public administration, public personnel administration, East European politics, public policy.

Snively, Keith, Assistant Professor, Ph.D., University of California at Davis, 1984; 1984. Public administration; personnel management; state, local, and urban government.

Somit, Albert, Distinguished Service Professor, Ph.D., University of Chicago, 1947; 1980. Political theory and bio-politics.

Stauber, Leland G., Associate Professor, Ph.D., Harvard University, 1964; 1966. Socialism, comparative public policy, comparative government and politics.

Surley, William S., Professor, Ph.D., University of Washington, 1972; 1971. International relations, comparative politics.

Psychology

COLLEGE OF LIBERAL ARTS

Bekker, L. Demoyne, Associate Professor, Ph.D., Ohio State University, 1968; 1969. Clinical, personality development, family interactions, family therapy, adjustment to stress.

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.

Carrell, Patricia L., Professor, Ph.D., University of Texas at Austin, 1966; 1968. Experimental, developmental, psycholinguistics, cognition, second language.

Carrier, Neil A., Professor, *Emeritus*, Ph.D., University of Michigan, 1956; 1957. Experimental, college teaching, classroom performance, assessment of instruction.

Cunningham, Jean, Assistant Professor, Ph.D., University of Utah, 1981; 1981. Clinical self-disclosure, human sexuality, sex-roles, psychological assessment.

Dillon-Sumner, Ronna, Associate Professor, Ph.D., University of California, Riverside, 1978; 1978. Experimental, human psychophysiology, cognitive assessment, life span, cognitive development.

Dollinger, Stephen, Associate 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. Experimental, learning theory, motivation, discrimination learning.

Gannon, Linda, Associate Professor, Ph.D., University of Wisconsin, 1975; 1975. Clinical, human psychophysiology, behavioral medicine, psychosomatic disorders, learned helplessness, feminist therapy.

Gilbert, Brenda O., Assistant Professor, Ph.D., University of Florida, 1985; 1986. Clinical, child behavior therapy, pediatric psychology, child behavior assessment.

Gilbert, David G., Assistant 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.

Hamilton, Mary, Assistant Professor, Ph.D., University of Missouri, 1975; 1981. Counseling, cognitive style, psychotherapy consultation, selected clinical topics, environmental psychology.

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.

Lit, Alfred, Professor, *Emeritus*, Ph.D., Columbia University, 1948; 1961. Experimental, visual science, perception, human engineering.

McHose, James H., Professor and Chair, Ph.D., University of Iowa, 1961; 1961. Experimental, learning theory, motivation, animal learning.

McKillip, John A., Associate 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.

Radtke, Robert C., Associate Professor, Ph.D., State University of Iowa, 1963; 1966. Experimental, memory, cognitive processes, aging.

Rafferty, Janet E., Professor, Ph.D., Ohio State University, 1952; 1954. Clinical, personality, child, prevention and intervention.

Ramanaiah, Nerella, Professor, Ph.D., University of Oregon, 1971; 1971. Experimental, clinical personality assessment, test theory, quantitative methods.

Ringuette, Eugene L., Associate Professor, Ph.D., Purdue University, 1963; 1967. Clinical, psychology-law research, psychotherapy, neuropsychology.

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.

Shoemaker, Donald J., Professor, *Emeritus* Ph.D., Ohio State University, 1955; 1960. Clinical, development and treatment of stuttering, psychotherapy, family interactions.

Smith, Douglas C., Associate Professor, Ph.D., Kansas State University, 1977; 1979. Experimental, biopsychology, neuropsychology, 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.

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., Assistant Professor, Ph.D., University of Minnesota, 1972; 1978.

Counseling, assessment of training and supervision, women's career development, psychological measurement, leisure activities.

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; 1980. Clinical, community psychology, environmental psychology, behavioral analysis, intervention and theory.

Westberg, William C., Professor, *Emeritus* Ph.D., Pennsylvania State University, 194; 1952.

Yanico, Barbara, Associate Professor, Ph.D., Ohio State University, 1977; 1977. Counseling, psychology of women, sex role counseling theories, vocational development, employee relations.

Radio-Television

COLLEGE OF COMMUNICATIONS AND FINE ARTS

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.

Garry, Kenneth J., Assistant Professor, Ph.D., Southern Illinois University at Carbondale, 1982; 1972. Sales, management, an public broadcasting.

Hildreth, Richard, Associate Professor, *Emeritus*, M.S., Syracuse University, 1968; 1968.

Keller, Kenneth R., Assistant Professor, M.A., University of Illinois, 1966; 1984. Broadcast journalism, television news, broadcast reporting, documentary production, television field production.

Oglesbee, Frank, Assistant Professor, Ph.D., University of Missouri, 1969; 1972. Criticism and broadcasting effects.

Robbins, Buren C., Associate Professor, *Emeritus*, M.A., University of Iowa, 1936; 1949.

Shaw, Punch, Assistant Professor, Ph.D., University of Texas at Austin, 1983; 1985. Cable television and new technology.

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.

Welker, Randy, Assistant Professor, J.D., Southern Illinois University at Carbondale, 1981; 1982. Broadcast law and policy.

Recreation

COLLEGE OF EDUCATION

Allen, John R., Associate Professor and *Chair*, Ph.D., Southern Illinois University at Carbondale, 1978; 1978.

Glover, Regina, Assistant Professor, Ph.D., University of Maryland, 1983; 1983.

McEwen, Douglas, Associate Professor, Ph.D., Michigan State University, 1973; 1975.
O'Brien, William, Professor, *Emeritus*, Re.D., Indiana University, 1967; 1948.
Taylor, Loren, Professor, *Emeritus*, Ed.D., Columbia University, 1957; 1957.
Teaff, Joseph D., Associate Professor, Ed.D., Columbia University, 1973; 1980.
Wilhite, Barbara, Assistant Professor, Ph.D., University of Georgia, 1981; 1985.

Rehabilitation Institute

COLLEGE OF HUMAN RESOURCES

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.
Bender, Eleanor, Assistant Professor, *Emerita*, M.S., Southern Illinois University at Carbondale, 1972; 1961. Medical and psychosocial aspects of rehabilitation.
Bordieri, James E., Assistant 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, Associate 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. Rehabilitation of the blind and visually disabled.
Falvo, Donna, Associate Professor, Ph.D., Southern Illinois University at Carbondale, 1978; 1974. Maintenance and support of the disabled.
Gardner, Margaret S., Associate Professor, Ph.D., Northwestern University, 1960; 1968. Assessment, counseling, psychosocial aspects of aging.
Green, Regina, Assistant Professor, Ph.D., Utah State University, 1986; 1986. Experimental and applied behavior analysis, developmental disabilities.
Greene, Brandon, Associate 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. Psychometrics, research design, and statistical analysis in rehabilitation.
Hanley-Maxwell, Cheryl, Assistant Professor, Ph.D., University of Illinois, 1986; 1986. Supported employment for persons with severe disabilities, transitions from school-to-work for youth with handicaps, mental retardation.
Hawley, Irene B., Assistant Professor, *Emerita*, Ph.D., Southern Illinois University at Carbondale, 1973; 1968. Geriatric rehabilitation, community service delivery, marketing in rehabilitation.
Lee, Robert E., Associate Professor, *Emeritus*, Ph.D., University of Minnesota, 1964; 1964. Volunteer administration.
Miranti, Joseph P., Professor, *Emeritus*, M.D., Loyola University of Chicago, 1950; 1961. Medical aspects of disability.
Phillips, J. Stuart, Associate Professor, Ph.D., Florida State University, 1980; 1980. Rehabilitation administration, performance appraisal, facility administration, participative management practices.
Poppen, Roger L., Associate 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. Individual and group counseling.
Riggat, 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. Job placement, services for the blind.
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

Hayward, John F., Professor, *Emeritus*, Ph.D., University of Chicago, 1949; 1968.

Social Work

COLLEGE OF HUMAN RESOURCES

Auerbach, Arnold J., Professor, *Emeritus*, Ph.D., University of Pittsburgh, 1961; 1972.

Brown, Foster S., Assistant Professor and Assistant Director, Ph.D., Southern Illinois University at Carbondale, 1978; 1969. Direct practice, ethnicity, field instruction, micro-computers.

Davidson, Mary E., Associate Professor and Director, Ph.D., Brandeis University, 1975; 1984. Social welfare policy, planning, advocacy research, child welfare, and human rights.

Gross, Carol J., Assistant Professor, Ph.D., Indiana State University, 1980; 1980. Direct practice, child welfare, minorities.

Gunter, Patricia L., Assistant Professor, Ph.D., Southern Illinois University at Carbondale, 1980; 1977. Gerontology, social work methods and research, speciality areas in social work, rural, minorities, women, and homosexuality.

Newcomb, Paul R., Assistant Professor, Ph.D., Florida State University, 1986; 1986. Family and child welfare, micro practice, rural substance abuse, cohabitation.

Newman, Bernie S., Assistant Professor, Ph.D., University of Pittsburgh, 1985; 1986. Social work research methods, human behavior in the social environment, women's issues, gay/lesbian issues.

Parker, Michael D., Assistant Professor, D.S.W., Arizona State University, 1986; 1986. Social welfare policy and planning.

Sociology

COLLEGE OF LIBERAL ARTS

Alix, Ernest K., Associate Professor, Ph.D., Southern Illinois University at Carbondale, 1966; 1967. Deviant behavior, crime/delinquency, law and society.

Brooks, Melvin, Associate Professor, *Emeritus*, Ph.D., University of Wisconsin, 1941; 1956. Race and ethnic relations, methodology, interpersonal adjustment, migrant farm labor.

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.

Glasberg, Davita Silfen, Assistant Professor, Ph.D., State University of New York at Stony Brook, 1983; 1983. Political sociology, organizations, stratification, social change.

Hawkes, Roland K., Associate Professor, Ph.D., Johns Hopkins University, 1967; 1970. Research methods statistics, stratification and mobility.

Hendrix, Lewellyn, Associate Professor, Ph.D., Princeton University, 1974; 1971. Family and kinship, social stratification, cross-cultural studies.

ly and kinship, social stratification, cross-cultural studies.

Hope, Keith, Professor, Ph.D., London University, 1963; 1986. Social stratification and mobility, methods, history of ideas.

Johnson, Elmer H., Professor, Ph.D., University of Wisconsin, 1950; 1966. Crime/delinquency.

Lantz, Herman R., Professor, *Emeritus*, Ph.D., Ohio State University, 1950; 1950. Marriage/family, community, comparative systems.

Lareau, Annette P., Assistant Professor, Ph.D., University of California at Berkeley, 1985; 1986. Family, education, organizations, social stratification.

Nall, Frank C., II, Associate Professor, Ph.D., Michigan State University, 1959; 1964. Culture, urban sociology, black culture.

Shalin, Dmitri N., Assistant Professor, Ph.D., Institute of Sociology Research, USSR Academy of Sciences, 1973; 1982. Social theory, history of theory, comparative/political sociology.

Shelby, Lon R., Professor and Chair, Ph.D., University of North Carolina, 1962; 1979. Social historical studies, science and technology, historical methods.

Snyder, Charles R., Professor, *Emeritus*, Ph.D., Yale University, 1954; 1960. Deviant behavior, crime/delinquency, medical sociology.

Ward, Kathryn B., Assistant Professor, Ph.D., University of Iowa, 1982; 1982. Social demography, women's studies, cross-national studies.

Special Education

COLLEGE OF EDUCATION

Bates, Paul, Associate Professor, Ph.D., University of Wisconsin, 1978; 1978.

Casey, John P., Professor, *Emeritus*, Ed.D., Indiana University, 1963; 1964.

Cordoni, Barbara, Associate 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.

Hisama, Toshiaki, Associate Professor, Ph.D., University of Oregon, 1971; 1971.

Juul, Kristen, Professor, Ph.D., Wayne State University, 1953; 1970.

McKay, Elizabeth B., Associate Professor, *Emerita*, Ph.D., Syracuse University, 1952; 1952.

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, Assistant Professor, Ph.D., University of Iowa, 1982; 1981. Interpersonal communication, conversation analysis, media studies.

Davis, Dennis, Professor, Ph.D., University of Minnesota, 1973; 1984. Political communication, quantitative research methods, media studies.

Higgerson, Mary Lou, Associate Professor, Ph.D., University of Kansas, 1974; 1973. Organizational communication and public relations.

Jasinski, James, Assistant Professor, Ph.D., Northwestern University, 1986; 1985. Rhetorical theory, public address, rhetorical criticism.

Kleinau, Marion L., Professor, Ph.D., University of Wisconsin, 1961; 1959. Oral interpretation, communication education.

Kleinau, Marvin D., Associate Professor and *Chair*, Ph.D., Southern Illinois University at Carbondale, 1977; 1963. Communication education, argumentation, rhetoric, and public address.

Langigan, Richard L., Professor, Ph.D., Southern Illinois University at Carbondale, 1969; 1974. Continental rhetoric, semiology, phenomenology, and philosophy of communication.

Micken, Ralph A., Professor, *Emeritus*, Ph.D., Northwestern University, 1948; 1957.

Pace, Thomas J., Professor, Ph.D., University of Denver, 1957; 1965. Interpersonal and small group communication, phenomenology and philosophy of communication, rhetoric, and public address.

Parkinson, Michael, Associate Professor, Ph.D., University of Oklahoma, 1978; 1978. Language behavior; organizational communication, public relations.

Pelias, Mary, Assistant Professor, Ph.D., Southern Illinois University at Carbondale, 1982; 1983. Communication education, basic course coordinator, research methods.

Pelias, Ronald, Assistant Professor, Ph.D., University of Illinois, 1979; 1981. Oral interpretation, interpersonal communication, literary criticism.

Potter, David J., Professor, *Emeritus*, Ph.D., Columbia University, 1943; 1960.

Sanders, Keith R., Professor, Ph.D., University of Pittsburgh, 1968; 1967. Political communication, interpersonal and small group communication.

Scudder, Joseph, Assistant Professor, Ph.D., Indiana University, 1985; 1985. Organizational communication, small group communication, interpersonal communication.

Smith, William D., Associate Professor, Ph.D., Southern Illinois University at Car-

bondale, 1964; 1961. Interpersonal communication, small group communication, public speaking.

Talley, C. Horton, Professor, *Emeritus*, Ph.D., State University of Iowa, 1936; 1948.

Van Oosting, James, Ph.D., Assistant Professor, Northwestern University, 1981; 1981. Oral interpretation, creative writing, children's literature.

Wakefield, D. Gay, Assistant Professor, Ed.D., East Texas State University, 1983; 1984. Public relations.

Technical Careers, School of

Alden, Elaine, Associate Professor, Ph.D., University of Pittsburgh, 1971; 1975.

Bleyer, Dorothy R., Associate Professor, *Emerita*, Ph.D., Southern Illinois University at Carbondale, 1977; 1957.

Brooks, Thomas M., Professor, Ph.D., Pennsylvania State University, 1961; 1971.

Caldwell, Paul, Associate Professor, *Emeritus*, M.S.Ed., Southern Illinois University at Carbondale, 1965; 1960.

Clarke, David S., Professor, M.S., Catholic University, 1980; 1981. Architecture, urban design, business, and economics.

Dallman, Murnice H., Associate Professor, *Emeritus*, M.S.Ed., Southern Illinois University at Carbondale, 1960; 1954.

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.

Hertz, Donald G., Associate Professor, Ed. M., University of Oklahoma, 1953; 1965.

Hertz, Vivienne L., Associate Professor, Ph.D., Southern Illinois University at Carbondale, 1980; 1968.

Humphries, James T., Associate Professor, M.S., Southern Illinois University at Carbondale, 1980; 1979.

Johnston, Chester E., Associate Professor, *Emeritus*, A.M., George Peabody College of Teachers, 1953; 1955.

Lampman, Duncan L., Associate Professor, *Emeritus*, M.S.Ed., Southern Illinois University at Carbondale, 1956; 1954.

Little, Harold, Associate Professor, *Emeritus*, B.S., Pennsylvania State University, 1951; 1964.

Miller, Harry, Professor, Ed.D., University of Nebraska, 1970; 1970.

Robb, James, Associate Professor, *Emeritus*, Ph.D., Southern Illinois University at Carbondale, 1974; 1962.

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, M.S., Bradley University, 1952; 1962.

Traylor, George Lelon, Associate Professor, *Emeritus*, M.S.Ed., Southern Illinois University at Carbondale, 1965; 1957.

Trotter, Gene, Associate Professor, *Emeritus*, B.S., North Dakota State University, 1939; 1973.

Vaughn, Frank Eugene, Associate Professor, *Emeritus*, M.S.Ed., Southern Illinois University at Carbondale, 1961; 1952.

Vitello, Elaine M., Associate 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 and Chair, 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.

Johnson, Marvin E., Professor, Ed.D., University of Missouri-Columbia, 1959; 1948.

Klopp, Mark E., Associate Professor, *Emeritus*, M.S.Ed., Pennsylvania State University, 1954; 1956.

Moeller, C. Merrill, Associate Professor, *Emeritus*, M.S.C.E., Kansas State University, 1951; 1956.

Rogers, Lee, Associate Professor, *Emeritus*, Ph.D., Southern Illinois University at Carbondale, 1975; 1967.

Theater

COLLEGE OF COMMUNICATIONS AND FINE ARTS

Carlin, Elizabeth, Assistant Professor, M.F.A., Temple University, 1983; 1986. Acting, voice, and speech.

Hiatt, Jan, Assistant Professor, M.F.A., Ohio University, 1973; 1985. Costume design.

Hirsig, Neal, Adjunct Associate Professor, M.F.A., University of Montana, 1976; 1986. Lighting design, technical direction.

McLeod, Archibald, Professor, *Emeritus*, Ph.D., Cornell University, 1943; 1947. History and criticism.

Moe, Christian H., Professor and *Director of Graduate Studies*, Ph.D., Cornell University, 1958; 1958. Playwriting, theater history, and criticism.

Palec, Milan, Assistant Professor, M.F.A., Academy of Fine Arts, Prague, Czechoslovakia, 1973; 1984. Scenography.

Pinney, George, Assistant Professor, M.F.A., Southern Illinois University at Carbondale, 1980; 1982. Acting, stage movement, choreography, directing.

Stevens, David, Associate Professor and Chair, Ph.D., Bowling Green University, 1973; 1984. Theater history and criticism, directing.

Stewart-Harrison, Eelin, Professor, *Emer-*

itus, Ph.D., Louisiana State University, 1968; 1961. Costume design, acting.

Straumanis, Alfreds, Professor, Ph.D., Carnegie-Mellon University, 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. Business and office occupations education, teaching methodology, curriculum development, philosophy of vocational education, sex equity, vocational education administration.

Bailey, Larry J., Professor, Ed.D., University of Illinois, 1968; 1969. Career education, career development theory and research, curriculum development, research methodology, evaluation, humanistic/process education.

Bortz, Richard F., Professor, Ph.D., University of Minnesota, 1967; 1977. Occupational curriculum specialist, occupational analysis, curriculum development.

Buila, Theodore, Associate Professor, Ph.D., Cornell University, 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. Research procedures, graduate programs, teaching internships, curriculum development.

Fulfs, Anna Carol, Professor, *Emerita*, Ph.D., Ohio State University, 1946; 1952. Evaluation, curriculum with emphasis on philosophy, teacher education, consumer-home-making, H.E.R.O., Coop.

Gooch, Bill G., Associate Professor, Ed.D., University of Tennessee, 1973; 1973. Cooperative vocational education, management of vocational and technical education.

Grise, Kay S., Assistant Professor, Ph.D., The University of Tennessee-Knoxville, 1980; 1981. Textiles for energy conservation, end use performance of textiles, clothing for handicapped and elderly, foreign travel/study, fashion retailing, research methods and evaluation.

Huck, John F., Associate Professor, Ed.D., University of Illinois 1973; 1970. Applications of microcomputers in education, computer assisted instruction, vocational psychology, manpower research, adult vocational education.

Jenkins, James, Professor, Ed.D., Pennsylvania State University, 1955; 1956. Industrial arts, elementary and special education crafts, curriculum development.

Keenan, Dorothy, Professor, Ed.D., University of Illinois, 1962; 1961. Curriculum development, methods, competency based or mastery learning, consumer homemaking education.

Legacy, James, Associate Professor, Ph.D., Cornell University, 1976; 1977. Agricultural education, microcomputer use in education, curriculum development, extension education, teacher education, competency based vocational education.

Perreault, Heidi, Assistant Professor, Ed.D., Oklahoma State University, 1983; 1983. Business education, curriculum, microcomputer, training, and development.

Ramp, Wayne S., Professor, *Emeritus*, Ed.D., Bradley University, 1956; 1957. Supervision, philosophy and principles of occupational education, placement, vocational guidance, leadership development, competency-based education.

Reneau, Fred W., Associate Professor, Ed.D., Virginia Polytechnic Institute and State University, 1979; 1979. Agriculture education, adult education, research supervision, curriculum development, and microcomputing.

St. John, Wayne L., Associate Professor, Ph.D., University of Oregon, 1954; 1975. Clothing and textiles education, performance evaluation of textile products, socio-psychoeconomic aspects of textile products, instructional development, self-paced and computer-aided instruction, microcomputers in fashion retailing.

Stadt, Ronald W., Professor, Ed.D., University of Illinois, 1962; 1967. Evaluation, assessment, curriculum, leadership characteristics, industrial occupations, cooperative education, special needs.

Stitt, Thomas R., Professor, Ph.D., Ohio State University, 1967; 1967. Curriculum specialist, agricultural education, cooperative vocational education, adult education, and microcomputers.

Sullivan, James A., Professor, Ed.D., West Virginia University, 1967; 1968. Industrial occupations curriculum development, cooperative education, energy and power systems, hydraulic systems.

Washburn, John S., Associate Professor and Chair, Ed.D., University of Illinois, 1977; 1986. Administration and supervision research, professional development, employment and training policy/legislative issues.

Wood, Eugene S., Professor, *Emeritus*, Ed.D., University of Missouri, 1958; 1949. Agricultural education, post-high school programs in agriculture, teaching methods and curriculum development.

Zoology

COLLEGE OF SCIENCE

Anthony, Terence R., Associate Professor, M.D., University of Chicago, 1968; and Ph.D., University of Chicago, 1975; 1971. Ethology.

Beatty, Joseph A., Associate Professor,

Ph.D., Harvard University, 1969; 1965. Invertebrates: arachnida.

Blackwelder, Richard E., Professor, *Emeritus*, Ph.D., Stanford University, 1934; 1958.

Brandon, Ronald A., Professor and Chair, Ph.D., University of Illinois, 1962; 1963. Herpetology: systematics of amphibians.

Burr, Brooks M., Associate Professor and Director of Graduate Studies, Ph.D., University of Illinois, 1977; 1977. Ichthyology.

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, Ph.D., Oregon State University, 1977; 1984. Mammalogy, wildlife ecology.

Galbreath, Edwin C., Professor, *Emeritus*, Ph.D., University of Kansas, 1951; 1957.

Garoian, George, Professor, Ph.D., University of Illinois, 1956; 1956. Parasitology, protozoology.

George, William G., Professor, Ph.D., University of Arizona, 1961; 1964. Ornithology.

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.

Klimstra, Willard D., Distinguished Professor, *Emeritus*, Ph.D., Iowa State University, 1949; 1949. Vertebrate ecology: management, surface mining.

Kohler, Christopher, Assistant Professor, Ph.D., Virginia Polytechnic Institute, 1980; 1981. Ecology: management, and culture of aquatic organisms.

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. Reproduction: histology, cytochemistry.

McPherson, John E., Jr., Professor, Ph.D., Michigan State University, 1968; 1969. Entomology: insect ecology.

Paparo, Anthony A., Professor, Ph.D., Fordham University, 1969; 1973. Neurobiology; electron microscopy.

Phillippi, M. Ann, Assistant Professor, Ph.D., University of Kentucky, 1984; 1985. Ecology, natural area and resource management, conservation.

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, Ph.D., University of Kansas, 1955; 1955. Mammalogy: ecology, morphology.

Tacha, Thomas C., Assistant Professor, Ph.D., Oklahoma State University, 1981; 1983. Ecology: waterfowl and wetlands.
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.
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.
Dodd, Robert B., Professor, M.D., University of Nebraska, 1945; 1969.
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.
Herrick, Robert, Professor, M.D., Columbia University, 1956; 1974.
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, M.D., University of Illinois, 1950; 1972.
Juniper, Kerrison, Professor, M.D., Emory University, 1949; 1973.
Kabisch, William T., Professor, Ph.D., University of Chicago, 1954; 1970.
Masters, Thomas D., Clinical Professor, M.D., Rush Medical School, 1930; 1971.
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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.
Norris, Albert S., Professor, M.D., University of Western Ontario, 1951; 1972.

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, 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.
Troy, Bart, Clinical Associate Professor, M.D., Columbia College, 1961; 1973.
Zook, Elvin G., Professor, M.D., Indiana University, 1963; 1973.

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