

1978

1978-1979 Southern Illinois University Bulletin Carbondale Campus (Graduate Campus)

Southern Illinois University Carbondale

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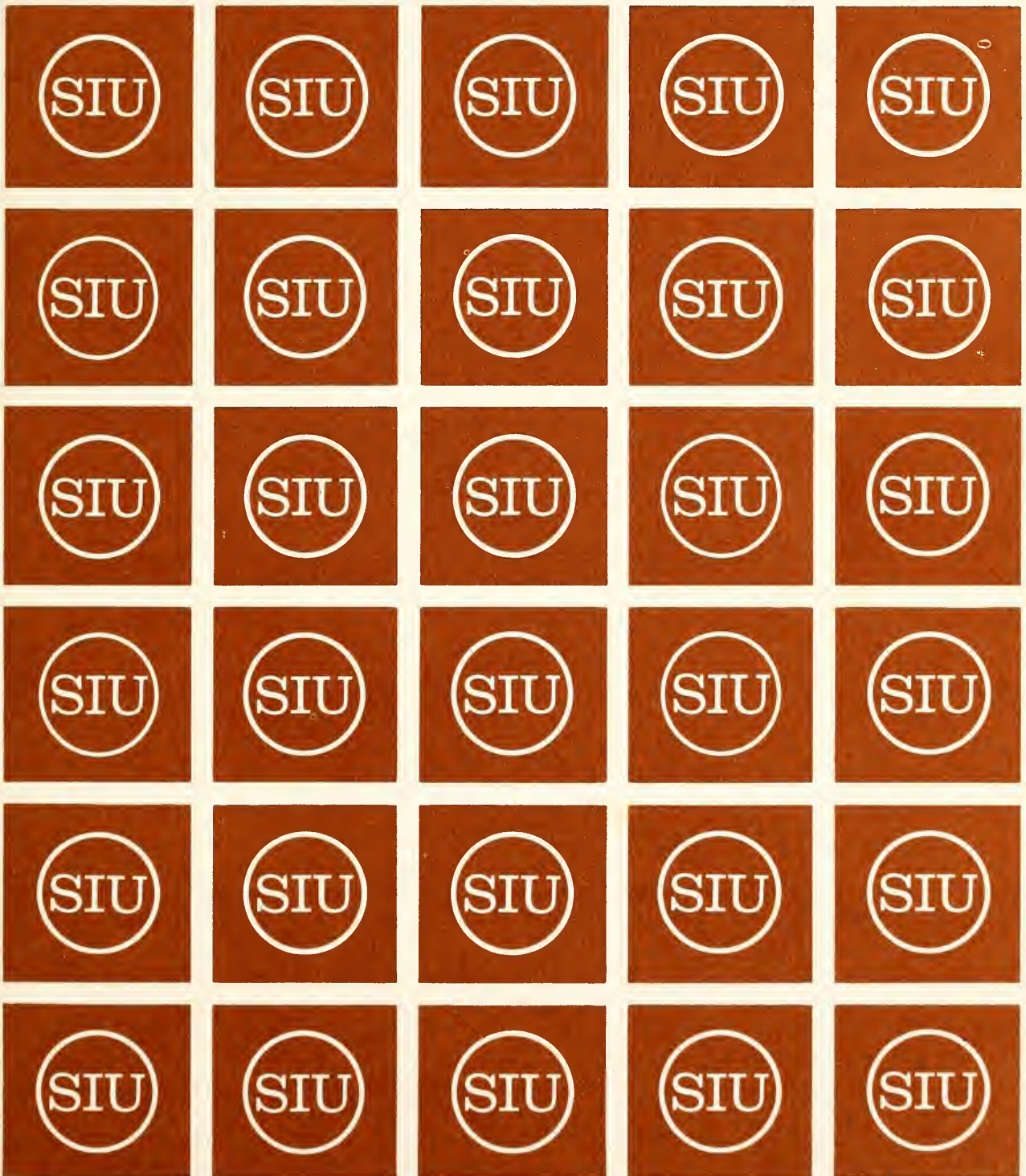
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Southern Illinois University Bulletin

1978-1979 Graduate Catalog

Southern Illinois University
at Carbondale



24-1

Southern Illinois University at Carbondale is required to comply with the provisions of Title IX of the Education Amendments of 1972 and Section 504 of the Rehabilitation Act of 1973. Title IX mandates that no person shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving federal financial assistance. Section 504 provides that "no otherwise qualified handicapped individual . . . shall, solely by reason of his handicap, be excluded from the participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance." Inquiries concerning the application of Title IX or Section 504 regulations may be directed to Dr. Mary Helen Gasser or Mr. Richard C. Hayes, University Affirmative Action Office, Anthony Hall, Room 104, telephone 536-6618.

This publication provides information about Southern Illinois University at Carbondale. Primary attention is given to its academic programs, rules and regulations, and procedures. A student beginning graduate work during the period of time covered by this catalog (summer, 1978 through spring, 1979) is subject to academic requirements of the Graduate School and of the degree programs as specified herein. If the requirements are subsequently changed, the student may elect either to meet the requirements in force in his particular degree program immediately prior to the change, or to meet the new requirements. If he elects the former option he shall be guaranteed a minimum period of time from the date that the program requirements were changed within which minimum period he 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 a doctoral student 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 a student in the last stage of his 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 his degree within the standard Graduate School limitations stated above. A student who elects to follow old requirements, but does not complete his work within the minimum period prescribed by the department, shall, unless he was in the last stage of his degree work when requirements changed, be subject to requirements in force at the time he completes his degree, 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. For further information contact the Graduate School, Woody Hall, B-103, Southern Illinois University, Carbondale, Illinois 62901, area code 618, 536-7791.



**Southern
Illinois
University
Bulletin**

**1978-1979
Graduate Catalog**

**Southern Illinois University
at Carbondale**

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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, 1978 through spring, 1979. It supersedes Volume 18, Number 7 of the *Southern Illinois University Bulletin*.

The following publications may be obtained free from University Graphics, 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

	Term Expires
Harris Rowe, <i>Chairman</i> , Jacksonville	1983
Ivan A. Elliott, Jr., <i>Vice-chairman</i> , Carmi	1979
Margaret Blackshere, <i>Secretary</i> , Madison	1979
Elizabeth Byrnes, Carbondale (Student Trustee)	1978
Wayne Heberer, Belleville	1981
James M. Grandon, Alton (Student Trustee)	1978
William R. Norwood, Elk Grove Village	1983
A. D. Van Meter, Jr., Springfield	1981
James M. Brown, <i>General Secretary of the Southern Illinois University System</i>	

Officers of Administration, Southern Illinois University at Carbondale

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Robert E. Gentry, *Vice President for Financial Affairs*
Bruce R. Swinburne, *Vice President for Student Affairs*
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Arthur Sussman, *University Legal Counsel*
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John C. Guyon, *Associate Vice President for Research and Dean*, Graduate School
Jack W. Graham, *Associate Dean*, Graduate School
Robert C. Radtke, *Associate Dean*, Graduate School
Michael R. Dingerson, *Associate Dean*, Graduate School and *Director*, Research
Development and Administration

University Calendar

Summer Session, 1978

Eight-Week Session Begins
Independence Day Holiday
Final Examinations
Commencement

Monday, June 12, 7:30 A.M.
Tuesday, July 4
Thursday and Friday, August 3-4
Saturday, August 5

Fall Semester, 1978

Semester Classes Begin
Labor Day Holiday
Thanksgiving Day Holiday

Monday, August 21
Monday, September 4
Saturday, November 18, 12:00 NOON—
Monday, November 27, 8:00 A.M.
Monday, December 11—Saturday,
December 16

Spring Semester, 1979

Semester Classes Begin
Lincoln's Birthday Holiday
Spring Vacation

Good Friday
Final Examinations
Commencement

Monday, January 15
Monday, February 12
Saturday, March 10, 12:00 NOON—
Monday, March 19, 8:00 A.M.
Friday, April 13
Monday, May 7—Saturday, May 12
Saturday, May 12



Aerial View of Campus



Woody Hall — Graduate School Location



Morris Library



Wham Education Building

1 The Graduate School

The Role of the Graduate School

The primary concern of the Graduate School is 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 achievement 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 a number of other countries.

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
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 for students who desire to submit research proposals to funding agencies. These include providing a resource library containing guidelines and application forms for applying for grants. General consultation is provided in proposal and budget preparation.

RESEARCH SHOPS AND SERVICES

To further assist faculty researchers, the Office of Research Development and Administration operates ten support service units for their use. The *Central Research Shop* is a facility which designs, repairs, and constructs special equipment required by researchers. The *Scientific 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: (1) *Electrical* and (2) *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 *Electronics Research Shop* provides a repair capability for electronics equipment. 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.

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 contains over 1,450,000 volumes and subscribes to more than 18,000 current periodicals. Over 59,000 volumes were added to the collection last year. In addition to books and journals, the library has extensive collections of maps, manuscripts, phonograph records, and 1,500,000 units of microfilm material. Morris Library is also a depository for federal, state, and U.N. documents. A major source for research in the behavioral sciences is the Human Relations Area files, consisting of copies of documents, books, articles, and manuscripts covering 170 world cultures. A separately housed law library is also available.

Supplementing the resources of Morris Library is the Center for Research Libraries (Chicago), in which the University holds membership. A printed book catalog of the center's some 2,000,000 volumes and microfilm copies of the card catalogs of the University of Illinois library and Illinois State Library are available for consultation. Limited on-line computer-based bibliographical search capabilities with Systems Development Corporation (SDC) and Lockheed Information System (LIS) has been initiated. The extensive scientific journal collection of the Argonne National Laboratory is also available to graduate students in person or on inter-library loan.

Computing Services

Computing Services supports the academic, administrative, and research needs of the University and the School of Medicine. The academic and research needs of faculty and students are supported by Academic Computing Services. Administra-

tive activities are supported by Administrative Computing Services. Both groups lend support to the Medical Education Health Science Information Systems. Major areas of service include maintenance of a large program library, consultation on computer-related problems, and periodical, noncredit instruction in computing. The major hardware component of the center is an IBM S/370, Model 158 computer. A special facility of the center is an instructional laboratory equipped with on-line terminals for interactive computing. There is also a variety of unit record equipment available on an open-shop basis including keypunching, sorting, and tabulating equipment.

Placement Services of the Career Planning and Placement Center

The 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 permanent file. All inquiries concerning this free service should be made to the Career Planning and Placement Center office.

Housing

On-Campus Housing. On-campus housing is available in residence halls for single graduate students. Some single rooms are available at an extra cost. All contracts will be for room and board.

University-owned housing for married students includes 304 unfurnished two- or three-bedroom air-conditioned apartments; 272 furnished efficiency, one- or two-bedroom apartments. Because the demand for university housing for married students exceeds the supply, information should be requested from University Housing, Building D, 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 \$50 a month for trailer spaces to \$250 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.

Health Service

Health Service, 115 Small Group Housing, provides medical care to students, including 24-hour emergency service, hospitalization, speciality care, primary care, intermediate or infirmary care, and prevention programs through payment of the medical benefit fee. Health Service also offers x-ray, laboratory, and pharmacy services. Hours of the service are 8:00 A.M. to 5:00 P.M. Monday through Friday and 8:00 A.M. to 1 P.M. on Saturday.

For emergency care when Health Service is not open, students should go to Memorial Hospital of Carbondale emergency room. If an ambulance is required, a student may call 453-3000, the SIU emergency number during the day or night.

University Ombudsperson, Office of the

The University Ombudsperson Office assists students and other members of the community in resolving large and small problems arising within the University context. Oftentimes this involves cutting through red tape, establishing communication, or simply pointing out proper procedures to follow. In cases where it is necessary, conciliation is sought by mediation between the individual and agents of the University. No matter whether the problem is simple or complex, an effort is

made to handle each case with care and dispatch. The thrust is toward finding reasonable, fair resolutions to problems and toward helping assure that individuals are treated with respect.

All inquiries are treated confidentially. The office is located in Woody Hall, C-302, phone (618) 453-2411, and is open 8-5, Monday through Friday.

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) fellowships or traineeships, (3) scholarships, (4) college work-study programs, and (5) loans. There are basic regulations that relate to these awards. Students should make application for the graduate assistantships, fellowships, or traineeships through the department to which they have been admitted. Information and application forms for the scholarships, student work program, and loans may be had by contacting the Student Work and Financial Assistance Center.

A student should submit an application for the particular award by February 1. Students should be sure that their applications for admission are complete including the submission of three 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.

The number of credit hours for which a graduate student may be enrolled is governed by the regulations on minimum and maximum course loads as outlined on page 27.

Graduate Assistant Appointments

Graduate assistant appointments are available in a number of departments, research agencies, and administrative units. This type of appointment comprises the single largest number of awards offered by the University. For these appointments, the students apply directly to the department chairperson of the department to which each has been admitted; this person may in turn refer the student 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.

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 \$341 per month for master's students for half-time duties; stipends increase at the Ph.D. level (a minimum of \$362 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.

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 such awards of this type are highly competitive based upon scholarship and potential to succeed 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 had by contacting the department to which one has been admitted or is seeking admission.

The stipend for a fellowship is \$305 per month, or \$3,355 for eleven months; for doctoral degree students the stipend is \$330 per month, or \$3,630 for eleven months. 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 at all 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 Graduate School-wide competition primarily based on 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. The application should be submitted by February 1. The award is for up to a maximum of 11 months at a monthly rate of \$396.

Students holding a dissertation research award are expected to devote full-time to the approved research project as determined by their department. Normally a 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 fellowships entitled graduate dean's fellowships are offered annually to students who show promise of success in graduate studies even though their previous academic achievements may have been hindered because they are members of a minority group, because of their socioeconomic status, or because of their sex. The awards are usually made to students who are well qualified by the usual indicators of promise for graduate work such as undergraduate grade-point averages and GRE or MAT scores, but whose status in one of the categories named above has meant that their records are not impressive enough for them to receive fellowships in the regular fellowship competition with the entire graduate student body of Southern Illinois University at Carbondale. 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.

Tuition Scholarships

A limited number of tuition scholarships are awarded to graduate students by the Student Work and Financial Assistance Office 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 Student Work and Financial Assistance Office. Completed applications are forwarded to the Graduate School for recommendations and returned to the Student Work and Financial Assistance Office for final consideration. Completed application forms, including an ACT Family Financial Statement, should be in the Student Work and Financial Assistance Office no later than April 1 preceding the year for which the tuition scholarship is needed.

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 Ph.D. 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.

Graduate Assistant Appointees—Tuition Waiver

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, said 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 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.

Regulations regarding tuition waivers for traineeships depend upon the conditions established in relationship to each traineeship.

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

Illinois Residents				Non-Illinois Residents		
Semester Hours Enrolled	Tuition	Student Fees	Total	Tuition	Student Fees	Total
1	\$ 22.00	\$ 9.09	\$ 31.09	\$ 66.00	\$ 9.09	\$ 75.08
2	44.00	12.17	56.17	132.00	12.17	144.17
3	66.00	17.50	83.50	198.00	17.50	215.50
4	88.00	23.00	111.00	264.00	23.00	287.00
5	110.00	28.50	138.50	330.00	28.50	358.50
6	132.00	74.00	206.00	396.00	74.00	470.00
7	154.00	79.50	233.50	462.00	79.50	544.50
8	176.00	85.00	261.00	528.00	85.00	613.00
9	198.00	90.50	288.50	594.00	90.50	682.50
10	220.00	96.00	316.00	660.00	96.00	756.00
11	242.00	101.50	343.50	726.00	101.50	827.50
12 or more	262.00	107.00	369.00	786.00	107.00	893.00

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. 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.

Student Welfare and Recreation Fund (SWRF) Fee. Provides funding for construction and operation of physical facilities for student recreation and operation of recreational and intramural programs.

Student Medical Benefit Fee. Assessed to students enrolling for 6 or more semester hours and 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 \$40.00 fee is entitled to full medical benefits at the Health Service. One who has comparable coverage may seek a refund within the first two 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.

Students' Attorney Program Fee. Provides funding for a legal service program. Students will pay \$1 as a part of their student fees. Students who do not wish to participate in the program may seek a refund of the \$1 by contacting the Office of Admissions and Records by the end of the second week of the semester. Students who receive refunds are not eligible for any benefits of the program.

Microfilming Fee (Doctoral Dissertation). There is a fee of \$31.00 required of all doctoral students at the time the dissertation is submitted for approval. If copyright is desired, an additional fee of \$20.00 is required.

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. 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 \$31.00 fee to cover the cost of publication of the dissertation abstract and microfilming the dissertation.
5. 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. An Illinois State Scholarship may cover all tuition and student fees or the scholarship may be a partial award. Also, 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 the tuition, the student activity fee, and the graduation fee. The Illinois Scholarship for Dependents of Prisoners of War and the Illinois Bilingual Scholarship exempts the student from paying tuition and all mandatory non-fundable fees.
6. Adult education course fees are computed on the basis of approximately sixty cents per contact hour.
7. 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.
8. Students registering for courses on an audit basis pay the same tuition and fees as though they were registering for the courses for credit.
9. Out-of-state students will find the official University regulations governing

determination of residency status for assessment of tuition later in this chapter.

10. Students enrolled in public service courses only pay tuition and \$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 tuition and fee statement and may pay either by mail or in person at the Bursar's Office, by the deadline date, in accordance with instructions accompanying the tuition and fee 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 at the time of registration.

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 should make application for a refund at the Office of Admissions and Records. Mail requests for a refund will be honored.

A refund of tuition and fees will be made to students who officially withdraw from school by the specific withdrawal deadlines.

DEADLINES FOR WITHDRAWING FROM THE UNIVERSITY TO RECEIVE A REFUND

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

If students withdraw in person, they will receive an immediate cash refund. If they withdraw by mail, they will receive a refund check in approximately four weeks after the withdrawal has been received by the Office of Admissions and Records. No refunding of tuition and fees is made for a 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

Special fee deferments are available to students who (1) can demonstrate financial need, (2) meet minimal requirements, and (3) can provide written verification of the ability to pay. Information on fee deferments is publicized each term in the Student Relations Office, the Office of Admissions and Records, Bursar's Office, Student Work and Financial Assistance Office, and the *Daily Egyptian*. Guidelines

may vary from term to term and year to year and students are advised to seek out the accurate information rather than assume they qualify for a deferment.

Students applying for a fee deferment must complete registration to the point of receipt of a fee statement. Applicants must be full-time students as defined by the Office of Admissions and Records and the fee statement must bear a minimum balance of \$65. The fee statement and written verification from the source of funds to be used to pay tuition and fees must be presented to the Student Relations Office to obtain an application. Applications are processed one week prior to the first week of classes. Recipients of fee deferments will not be allowed to register for any future semester until payment is made. Additional information on deferments is available in the Student Relations Office. Phone or mail requests for deferments will not be accepted.

If approval for a deferment is granted, tuition and fees will be placed on a special fee code for the term and the student will be obligated to pay by the approved deferred date. Failure to pay deferred fees by this date does not cancel one's registration nor remove the obligation to pay the deferred fees even if the student withdraws from school or discontinues attendance. Failure to pay deferred fees will result in withholding of permission to register for succeeding terms and withholding of transcripts.

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.

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 uninterrupted 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 Immigra-

tion 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, non-academic) 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.

Graduate Degrees Offered

MASTER'S DEGREES

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

Abbreviations: Master of Arts, MA; Master of Business Administration, MBA; Master of Fine Arts, MFA; Master of Music, MM; Master of Music Education, MMed; Master of Public Affairs, MPA; Master of Science, MS; Master of Science in Education, MS in Ed.

Administration of Justice	MS	Health Education	MS in Ed
Agricultural Industries	MS	Higher Education	MS in Ed
Animal Industries	MS	History	MA
Anthropology	MA	Home Economics	
Art	MFA	Education	MS in Ed
Behavior Modification	MA, MS	Journalism	MA, MS
Biological Sciences	MS	Latin American Studies	MA
Botany	MA, MS	Linguistics	MA
Business Administration	MBA	Mathematics	MA, MS
Business Education	MS in Ed	Microbiology	MA
Chemistry	MS	Mining Engineering	MS
Cinema and Photography	MFA	Music	MM, MMed
Community Development	MS	Occupational	
Computer Science	MS	Education	MS, MS in Ed
Early Childhood		Philosophy	MA
Education	MS in Ed	Physical Education	MS in Ed
Economics	MA, MS	Physics	MA, MS
Educational		Physiology	MS
Administration	MS in Ed	Plant and Soil Science	MS
Educational Media	MS in Ed	Political Science	MA
Elementary Education	MS in Ed	Psychology	MA, MS
Engineering	MS	Public Affairs	MPA
Engineering Biophysics	MS	Public Visual Communications	MA
English	MA	Recreation	MS in Ed
English as a Foreign Language	MA	Rehabilitation Administration	
Foreign Languages		and Services	MA, MS
and Literatures		Rehabilitation Counseling	MA, MS
French	MA	Secondary Education	MS in Ed
German	MA	Sociology	MA, MS
Spanish	MA	Special Education	MS in Ed
Forestry	MS	Speech Communication	MA, MS
Geography	MA, MS	Speech Pathology and Audiology	MS
Geology	MS	Theater	MA, MFA
Guidance and Educational		Zoology	MA, MS
Psychology	MS in Ed		

SPECIALIST DEGREE

Specialist degree programs are available in the fields listed below.

Educational Administration

Guidance and Educational Psychology

Elementary Education

Secondary Education

DOCTOR OF PHILOSOPHY DEGREE

Doctor of Philosophy degree programs are available in the fields listed below.

Anthropology

Historical Studies

Political Science

Botany

Journalism

Psychology

Chemistry

Mathematics

Sociology

Economics

Microbiology

Speech/Communication/Theater

Education

Molecular Science

Speech Pathology and Audiology

English

Philosophy

Zoology

Geography

Physiology

Graduate Advisers

Administration of Justice: Lawrence Bennett

Agricultural Industries: Lyle Solverson

Animal Industries: Harold H. Hodson, Jr.

Anthropology: Bruce MacLachlan, and M. Lionel Bender

Art: Michael O. Onken, and Milton F. Sullivan

Behavioral Modification: Anthony Cuvo

Biological Sciences: Edwin Galbreath

Botany: Raymond Stotler, and Robert H. Mohlenbrock

Business Administration: R. Clifton Andersen

Business Education: Marcia Anderson

Chemistry & Biochemistry: James Tyrrell

Cinema and Photography: Peter J. Bukalski

Community Development: Ira Ehrlich

Computer Science: Kenneth Danhof, and A. M. Mark

Early Childhood Education: Margaret Matthias

Economics: Donald R. Adams

Education (Ph.D.): Donald L. Beggs

Educational Leadership: Dean Stuck, and Harry G. Miller

Educational Media: Doris Dale

Elementary Education: Morris Lamb, and Fred Sloan

Engineering:

Electrical Science and Systems Engr.: J. G. Smith

Engineering Mechanics and Materials: Philip K. Davis

Thermal and Environmental Engineering: J. W. Chen

Engineering Biophysics: Harold M. Kaplan

English: Paul Hurley

English as a Foreign Language: Patricia Carrell

Foreign Languages and Literatures:

French: David Gobert, and Eugene Timpe

German: Helmet Liedloff, and Eugene Timpe

Spanish: Warren Meinhardt, and Eugene Timpe

Forestry: Howard A. Spalt

Geography: David M. Sharpe, and Stanley Lieber

Geology: Rex Cole, Dale Ritter, and Russell Dutcher

Guidance and Educational Psychology: Ernest L. Lewis

Health Education: Donald N. Boydston

Higher Education: John E. King, Roland Keene, Donald Tolle, Jack Graham, and

Arthur Casebeer

History: Betty Fladeland

Historical Studies (Ph.D.): Betty Fladeland

Home Economics: Michael Zurich, Wayne L. St. John, Frank Konishi, and Karen

Craig

Home Economics Education: Anna Carol Fults

Journalism: Robert E. Trager

Latin American Studies: William Garner

Linguistics: Patricia Carrell
Mathematics: Carl Langenhop
Microbiology: Maurice Ogur
Mining Engineering: Atmesh Sinha
Molecular Science: Gerard V. Smith
Music: Robert E. Mueller
Occupational Education: Bill G. Gooch, James A. Sullivan, and John Erickson
Philosophy: David S. Clarke
Physical Education: James J. Wilkinson
Physics: Frank Sanders
Physiology: Matthew Freund
Plant and Soil Science: Gerald D. Coorts
Political Science: David R. Derge
Psychology: David Ehrenfreund, and Janet Rafferty
Public Affairs: Charles Goodsell
Public Visual Communications: Thomas O. Olson
Recreation: Owen R. Smith
Rehabilitation Administration and Services: Jerome R. Lorenz
Rehabilitation Counseling: Brockman Schumacher
Secondary Education: Fred A. Sloan, and Arthur Aikman
Sociology: Jerry Gaston
Special Education: Howard Morgan
Speech Communication: Thomas Pace
Speech Pathology and Audiology: Gene J. Brutten
Theater: Christian H. Moe
Zoology: W. D. Klimstra, and William M. Lewis

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 in this chapter titled General Regulations and Procedures. For information about specific degree programs, the student should consult the appropriate section in Chapter 2.

MASTER'S DEGREE PROGRAM

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.

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 applicant may be admitted as an unclassified student, and later apply to a degree program when 12 or more semester hours of graduate work at SIU at Carbondale have been completed with a grade point average of 3.00 or better in courses for which grades of *A, B, C, D, E, ABS, or WE* have been assigned.

The faculty of a degree-program unit may add its own grade-point average

* 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 transcripts at the time of application to complete all requirements for the bachelor's degree.

requirements and other requirements for admission to that particular program. The student should consult the description of the appropriate program in Chapter 2 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 *E*. 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. At least half of the credit applied toward fulfillment of master's degree requirements must be earned in courses offered by SIU at Carbondale, and at least 9 hours must be earned at SIU at Carbondale after admission to the degree program recommending the awarding of the degree. Fifteen or more hours must be earned in courses numbered 500 or above. Since certain degree programs require more than 30 hours, the student should consult the description of the appropriate program in Chapter 2 for specific requirements.

Each candidate for a master's degree is required to pass a comprehensive examination covering all of his 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 or elsewhere, will be counted toward the degree.

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.

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 student's vocational and professional goals.

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 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.

PROCEDURE

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.

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.

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 SIU at Carbondale.

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.

SIXTH-YEAR SPECIALIST DEGREE PROGRAM

The sixth-year specialist degree program is for a qualified student who wishes 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 educational administration, elementary education, guidance, and secondary education.

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. Departments may establish a higher scholastic requirement for admission and may use other selective criteria appropriate to the field of specialization. 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.

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.

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. 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.

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).

DOCTOR OF PHILOSOPHY DEGREE PROGRAM

Admission

Admission to a Ph.D. program in the Graduate School 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 Ph.D. program.* The graduate dean informs each student of any conditions for admission imposed by the Graduate School or by the academic unit.

General Requirements

The Ph.D. 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. There is no Graduate School requirement that a certain number of semester hours be taken for the Ph.D. Some degree programs do have requirements for the student of a certain number of semester hours. Therefore, the acceptability of work done at other institutions as a part of a Ph.D. program is at the discretion of the department.

No Ph.D. level residence-credit program may be established off campus, although coursework involved in a Ph.D. 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 Ph.D. programs.

Preliminary Examination

The student will generally prepare for this examination through independent study and coursework, as advised by the faculty of the Ph.D. program. The exami-

* An applicant to Ph.D. level study may begin the admission process when such 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.

nation 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 Ph.D. 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 Ph.D. must be fulfilled after admission to the Ph.D. program and before formal admission to Ph.D. candidacy. The residency requirement is satisfied by completion of 24 semester hours of credit on campus as a Ph.D. 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 Ph.D. degree, passed the preliminary examination and met the research tool requirement of the program. The Ph.D. 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.

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.

While such student is 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.

The student must submit two copies of the dissertation acceptable to the Graduate School, along with an abstract of 600 words or less. All dissertations will be microfilmed. There is a fee of \$31.00 to cover the cost of publication of the abstract and microfilming of the dissertation. 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 chairman 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.

Interdisciplinary Doctor of Philosophy Programs

These guidelines provide for interdisciplinary Ph.D. 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 Ph.D. 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 Ph.D. programs.

1. After admission to an established doctoral program at Southern Illinois University at Carbondale and upon the recommendation of the chairman or adviser of that program, a student may apply for an interdisciplinary Ph.D. 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 Ph.D. 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 Ph.D. 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, three of whom shall be from units offering the Ph.D.
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 spon-

sorship by a unit with an approved Ph.D. 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 Ph.D. Degree Requirements

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 \$31.00 microfilming fee.

Completion of microfilm agreement and survey of earned doctorates at the Graduate School office.

Degree conferred not less than six months nor more than five years after admission to candidacy.

Submission of departmental clearance form.

Other Types of Registration in Graduate 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 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 (see *Application for Graduate Study*). 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

An applicant who wishes to enroll for one term only or who has applied for admission too late to furnish official transcript(s) 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.

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 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 for 500-Level Courses

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.

General Regulations and Procedures

The following section includes Graduate School procedures and regulations applicable to all graduate students regardless of degree classification. Requirements

unique to the master's, specialist, and Ph.D. degrees, are stated in the section in this chapter titled Degree Requirements. For information about specific degree programs the student should consult the appropriate section in Chapter 2. Requirements unique to the non-degree classifications are stated in the section in this chapter titled Unclassified Students (Non-degree).

APPLICATION FOR GRADUATE STUDY

A student should obtain application forms from the Graduate School and submit 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 in Chapter 2 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 three official transcripts of the student record to the Graduate School. Students applying for unclassified (non-degree) status must have the registrar of the degree-granting institution send one official transcript indicating receipt of the bachelor's (or higher) degree to the Graduate School. Copies sent to a department are not acceptable. The recording of one or more college's grades upon the transcript of another college does not meet the requirements. No transcripts or other admission credentials will be returned or forwarded to other institutions. Only if these steps are taken and if the student seeks a degree 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 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.

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. Several departments require additional materials such as test scores or 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 resultant admission status after this process has been completed.

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 for which he was first admitted, a student applying to a degree program must have the registrar of all institutions previously attended furnish three official

transcripts to the Graduate School. An unclassified, non-degree 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 coursework at another institution between the first admission and the first registration, the applicant must have the registrar of the appropriate institution(s) furnish three official transcripts of this work regardless of the amount of time elapsed.

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 student 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 page 6.)

Admission of International Students

A student from abroad is subject to all requirements for admission established by the Graduate School. In addition, the applicant must complete special forms pertaining to the admission of international students. For these admission forms and for other information concerning international students, inquiries should be sent to the Graduate School, Southern Illinois University, 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. This test must have been taken no more than 12 months prior to the term for which the applicant is seeking admission.

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.

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 as outlined on page 18.

ADVISEMENT

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 program or in interpretation of regulations of the Graduate School and the University rests entirely upon the student. 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.

REGISTRATION

Only those students who have been officially admitted by the Graduate School will be permitted to register. Students should register in person. There is no registration by mail.

During the first week of the term, the student must have the approval of the Graduate School to register late. 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.

Withdrawal from Courses and from the University

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 Without a Grade
13-16 weeks	3rd week	5th week
9-12 weeks	2nd week	4th week
7 or 8 weeks	2nd week	3rd week
4-6 weeks	1st week	2nd 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 process.

This process starts with the academic adviser and is completed at the Registration Center. Official course withdrawals during the first five weeks in a semester result in no letter grade being assigned. Withdrawal deadlines for shorter sessions are printed in the appropriate Schedule of Classes, and students are subject to these printed deadlines. Thereafter, a *WP* (passing) or *WE* (failing) grade is assigned in keeping with the progress being made. For graduate students only, *W* grades may be given when no basis for evaluation has been established. Merely stopping attendance in courses without the processing of a program change will result in *ABS* grades being assigned. An *ABS* counts the same as an *E* or *WE* for scholastic purposes.

Students who are prevented, for reasons beyond their control, from processing program changes during the first five weeks of a semester and who later, during the semester, seek to do so with the request to have the program change backdated are referred to the dean of the Graduate School for approval or disapproval.

WITHDRAWAL FROM THE UNIVERSITY

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 who 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 seek to have a withdrawal from the University backdated from the date of actual processing are referred to the Graduate School for review and approval or disapproval prior to processing, provided grades have not yet been given.

Students seeking to withdraw from sessions already completed are referred to the dean of the Graduate School when the situation involves a possible change of grade, whether one course or all courses are involved. The dean forwards his recommendations via letter to the Office of Admissions and Records. The dean specifies the effective date of withdrawal which then serves as a basis for grade changes or other purposes involved.

Students who officially register for a session may not withdraw merely by the stopping of attendance. They need to process an official withdrawal form. Otherwise, grades of *ABS* will be given.

Refer to the section 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

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

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.

The maximum and minimum loads for graduate students under various types of financial support are summarized below:

TYPE OF FINANCIAL SUPPORT	16 WEEK SEMESTER		8 WEEK SESSION	
	Max.	Min.	Max.	Min.
No financial support	16		12	
Graduate Assistantships				
½ time appointment	12	6	6	3
¼ time appointment	14	6	7	3
More than ½ time appointment	8	3	4	2
Full-time University employees ¹	6		3	
Graduate Fellowships	16	12	8	5
Full Veteran's Benefits	16	10	8	5
Guaranteed Loans	16	8	8	6
SIU Scholarships	16	8	8	4

¹Civil Service staff must have approval from the Personnel Office to register for courses.

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. 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.

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 in Chapters 2 and 3.

TRANSFER CREDIT

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

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.

GRADING SYSTEM

Grades are recorded by the letters *A, B, C, D*, and *E* ($A=4.00$). *A* is for outstanding work, *B* for good or average performance, *C* for conditional or not fully satisfactory work, *D* and *E* for failure. Only courses for which the grades of *A, B, C*, or *S* have been received are acceptable in fulfillment of graduate degree requirements. Graduate students will not receive graduate credit for Pass/Fail grades. They may not register for 400-level courses in which Pass/Fail grading is mandatory and may not receive a grade of Pass or Fail in 400-level courses graded Pass/Fail on an elective basis. Other grades may be:

W—Authorized withdrawal made through a program change where no basis for evaluation has been established. Work may not be completed. This grade is not included in grade point computation for retention purposes.

WP—Authorized withdrawal with a passing grade made through a program change after the first five weeks of a regular semester. Work may not be completed.

WE—Authorized withdrawal with a failing grade made through a program change after the first five weeks of a regular semester. Work may not be completed, but grade is included in calculation of average.

INC—Incomplete. Has permission of the instructor to be completed within a time period designated by the instructor, but not to exceed two years from the close of the semester in which the course was taken. Any extension of this time limit must have the approval of the instructor, the departmental chairperson, the appropriate college dean, and the dean of the Graduate School. If the *INC* remains, it is not included in grade point computation. If the *INC* remains after two years, or until the time for graduation, it is converted to the grade of "E". To complete the work, a student should not register for the course again, but should complete the work from the original registration. (An *INC* for a course in which the *S/U* grade is authorized will revert to a *U* if the work is not completed at the time of graduation and will not be calculated in one's grade point average.)

DEF—Deferred. Used only for graduate courses of an individual, continuing nature such as research or thesis. When the work is completed, the grade is changed to a letter grade by the instructor, except in the case of theses or 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 degree program, the grade of *U* is automatically assigned upon receipt by the Graduate School of the action dismissing the student.

ABS—Unauthorized withdrawal. Used when student fails to continue in attend-

ance, but does not withdraw through a program change. Counted as an *E* in calculating grade point average.

S—Satisfactory. Used for noncredit courses, thesis and dissertation hours, and certain specially designated and approved 500-level research, internship, or practicum courses. Is not counted in calculating grade point average.

U—Unsatisfactory. Used for noncredit courses, thesis and dissertation hours, and certain specially designated and approved 500-level research, internship, or practicum courses. Is not counted in calculating grade point average.

AU—Audit. A student registering for a course on an audit basis receives no letter grade and no credit hours. An auditor's registration card must be marked accordingly and the student pays the same fees as though registering for credit.

During the first five weeks of a regular semester a student registered for a course for audit may change to credit status or vice versa through the official program change method. Thereafter the change may not be made.

Note: Letter grades *A*, *B*, *C*, *D*, and *E* as well as the grades *WE* and *ABS* are included in 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.

Authorized withdrawals made through a program change during the first five weeks of the regular semester do not carry a grade. After five weeks it is at the discretion of the instructor whether or not a *W*, *WP*, or *WE* for an authorized withdrawal. Deadlines for short session courses are printed in the appropriate Schedule of Classes and students are subject to these printed deadlines.

At the completion of a course, the final grade assigned to a student is the responsibility of the instructor of the course. When the work is completed for courses in which *INC* or *DEF* grades have been given, the instructor has the responsibility of determining the final grade to be assigned, and except for theses and dissertations, notifies the Office of Admissions and Records of the final grade to be given by means of the Grade Change Card. To change a final grade assigned to a student, the instructor should submit a Grade Change Card together with an explanation and justification of the grade change for the approval or disapproval of the departmental chairperson, the appropriate college dean, and the dean of the Graduate School.

ACADEMIC GRIEVANCES

Graduate students at Southern Illinois University at Carbondale 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 resulted in the filing of a grievance occurred.

A graduate student who wishes to appeal an academic decision should address said appeal to the chairperson of the academic unit or the director of the administrative unit in which the decision to be appealed occurred.

After appeal procedures open to the student at the academic or administrative level at which the conflict that has resulted in the filing of a grievance have been exhausted, the student may request a hearing before the academic grievance committee of the Graduate School. The academic grievance committee is advisory to the dean of the Graduate School and submits its findings to the dean. The academic grievance committee is composed of five members: three graduate faculty and two graduate students.

A graduate student desiring a hearing before the academic grievance committee must submit a written request to the dean of the Graduate School within 30 calendar days after the aggrieved has received the final decision of the person(s) who heard the complaint at the academic or administrative level at which the complaint has 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 based.
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. All previous action taken.

The request is forwarded within 24 hours to the chairpersons of the academic grievance committee. Upon receiving the complaint, the chairperson of the academic grievance committee selects the investigating team. The investigation is carried out promptly and confidentially and all pertinent facts are reported to the academic grievance committee within 21 days after the grievance has been filed.

Upon receiving the investigating team's report the academic grievance committee decides within 72 hours whether to conduct a grievance hearing or dismiss the complaint as not being a valid complaint or within the committee's jurisdiction or competence to decide. If the grievance is to be heard, the hearing begins within 30 days if at all possible. If the committee denies a hearing the grievant may appeal directly to the dean of the Graduate School.

In general, any question of the character or professional competence of any individual faculty member at Southern Illinois University at Carbondale is considered to be outside the competence of the academic grievance committee to judge.

RETENTION

Any student whose grade point average for all completed graduate courses falls below 3.00 will be placed on academic probation. All 400- and 500-level courses taken after a student is admitted to the Graduate School are considered graduate level and will be included in the graduate grade point average, unless the course is specifically designated, "Not for graduate credit," for all students.

An unclassified student who has accumulated six or more semester hours (or the equivalent) of *C* unbalanced by *A* in all graduate courses taken at SIU at Carbondale will be suspended by the Graduate School.

A 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 semester hours (or the equivalent) of *C* unbalanced by *A* in graduate-level courses taken at SIU at Carbondale, will be suspended from the Graduate School.

Four examples of cases where a student would be suspended: six hours of *C* and no hours of *A*; eight hours of *C* and two hours of *A*; two hours of *C*, two hours of *D*, and no hours of *A*; three hours of *C*, one hour of *E*, and no hours of *A*. 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.

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. Ph.D. students are also required to pay a fee of \$31.00 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. Ph.D. 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 the student before his death had substantially completed the work on his degree. 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 confidential character 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.



Neckers Building



Technology Building

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Academic Programs

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

The titles of the programs are summarized below in alphabetical order. 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 within the major; the requirements for these concentrations may be found in the program description.

Administration of Justice	English as a Foreign Language	Music
Agricultural Industries	Foreign Languages and Literatures	Occupational Education
Animal Industries	French	Philosophy
Anthropology	German	Physical Education
Art	Spanish	Physics
Behavior Modification	Forestry	Physiology
Biological Sciences	Geography	Plant and Soil Science
Botany	Geology	Political Science
Business Administration	Guidance and Educational Psychology	Psychology
Business Education	Health Education	Public Affairs
Chemistry	Higher Education	Public Visual Communications
Cinema and Photography	History	Recreation
Community Development	Historical Studies (Ph.D.)	Rehabilitation Administration
Computer Science	Home Economics Education	Rehabilitation Counseling
Early Childhood Education	Journalism	Secondary Education
Economics	Latin American Studies	Sociology
Education (Ph.D.)	Linguistics	Special Education
Educational Administration and Foundations	Mathematics	Speech Communication
Educational Media	Microbiology	Speech Pathology and Audiology
Elementary Education	Mining Engineering	Theater
Engineering	Molecular Science	Zoology
Engineering Biophysics		
English		

Administration of Justice

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; court auxiliary services; and criminal justice planning. With a merger of theoretical orientations and practical experience, concentrations are offered in the areas of law enforcement, juvenile delinquency prevention and treatment, corrections, criminal justice research, and planning and general criminal justice.

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. The internship paper is an integral part of the learning process for those who lack first-hand experience in a criminal justice agency.

Admission

Full admission to the graduate program requires at least a 2.7 overall undergraduate average and acceptance by the faculty.

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 concentration chosen and the extent of planned specialization. In individual cases, additional selected undergraduate courses may be required for acceptance in this program.

Requirements

A minimum of 36 semester hours is required for graduation made up of 15 semester hours of core courses plus agreed upon units in the area of concentration.

CORE COURSES (Required of all students)

CREDIT HOURS	COURSE NO.	TITLE
3	AJ 500	History and Philosophy of the Criminal Justice System
3	AJ 504	Criminological Theory
For those interested in concentrations in law enforcement and corrections, the following courses are required:		
6	AJ 416	Methods of Criminal Justice Research
	AJ 417	Research Practicum in Administration of Justice
3 either or	AJ 587	Seminar in Law Enforcement, or
	AJ 571	Correctional Systems in Criminal Justice
For those pursuing concentrations in criminal justice research or criminological theory, the following are required:		
3 to 6	AJ 516	Research Design and Analysis in Criminal Justice
3 from among	(AJ 587	Seminar in Law Enforcement, or
	(AJ 562	Fundamental Legal Systems in Criminal Justice, or
	(AJ 571	Correctional Systems in Criminal Justice

The area of concentration will be composed of 12 units in addition to the introductory course, 9 of which shall be selected from among the Administration of Justice offerings.

After the completion of 12 to 20 units and prior to the submission of the thesis or

project proposal, the student must take a written preliminary examination covering the history and philosophy of criminal justice, basic research concepts, and an integrated approach to problem solving involving information from coursework in the area of the candidate's concentration. Students failing this test may petition to be re-examined, usually within the following semester.

Completion of the degree program requires the writing and defense of a thesis or field project report, the latter typically representing the study of a problem confronted by the student during his field experience. A thesis will be required for those students in the criminal justice research and planning concentration and those planning to continue on toward an advanced degree.

Internship placement is included as an integral part of most areas of concentration to insure a blending of practical experience with the academic training received by the student.

Within the areas of concentration, a number of specialties are available—law enforcement administration, community-based corrections, juvenile justice, administration of justice education, etc.

Application forms for both the Graduate School and the 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 admissions committee after admission by the Graduate School.

More detailed descriptions of the graduate program, as well as information on teaching and research assistantships and fellowships, may be obtained by writing The Graduate Program, Center for the Study of Crime, Delinquency, and Corrections.

Agricultural Industries

The Department of Agricultural Industries offers graduate work leading to the Master of Science degree in agricultural industries with concentrations in agricultural economics, agricultural education, agricultural mechanization and agricultural services. A specialization in agricultural environmental studies is available in each concentration.

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

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 industries 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.

A thesis or research paper is required for the Master of Science degree. In some cases, particularly for students holding assistantships, two academic semesters and a summer may not be sufficient time in which to complete degree requirements.

The School of Agriculture offers courses in agricultural industries as part of a residence-center program at Western Illinois University.

Inquiries for financial assistance and additional information should be directed to the chairman of the Department of Agricultural Industries, Southern Illinois University, Carbondale, Illinois 62901.

AGRICULTURAL ECONOMICS

The concentration in agricultural economics is designed for the professional agricultural economist. Specialization may be attained in farm management, ag-

ricultural marketing, agricultural prices, agricultural policy, resource economics, and agri-business management with emphasis on application to agricultural environmental studies available in each specialization.

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 thesis or research hours, is required for the Master of Science degree in agricultural industries with a concentration in agricultural economics. At least 15 hours must be at the 500 level.

Twelve hours of agricultural economics courses are required. This includes Agricultural Industries 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 economics courses and Economics 467 or equivalent. The emphasis in business is accomplished by completing six hours of graduate level business courses and Business Administration 410 or equivalent, 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 agricultural economics courses or courses in their area of specialization and interest to meet the 30 hour M.S. degree requirement. M.S. 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 EDUCATION

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. Application of principles of agricultural education to agricultural environmental studies may be emphasized.

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

A minimum of 15 hours is required in agricultural industries 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 SERVICES

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, are required for an M.S. degree in agricultural industries 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 area of specialization.

AGRICULTURAL MECHANIZATION

The concentration in agricultural mechanization is designed to permit students interested in agricultural mechanization the opportunity to specialize in 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 are required for the Master of Science degree in agricultural industries with a concentration in agricultural mechanization. At least 15 hours must be at the 500 level. Based on the professional goals of students, 24 hours of course work may be selected from one or more of the following: the School of Agriculture, the College of Education, the Department of Technology, and the College of Business and Administration.

Animal Industries

The Department of Animal Industries offers programs of study leading to the Master of Science degree in animal industries. Programs may be designed to meet the requirements of candidates in the various disciplines of breeding, nutrition, physiology 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 for admission to graduate study in animal industries should be directed to the Graduate School. The applicant must have the registrar of each college previously attended send three official transcripts of his record directly to the Graduate School. Supporting materials for the application should be sent to the Department of Animal Industries and include two letters of recommendation from individuals who can evaluate the candidate's academic ability and a letter in which the applicant expresses his professional and personal objectives.

Requirements

Minimum requirements for the master's degree may be fulfilled by satisfactory completion of 30 semester hours of graduate credit. If the student writes a thesis, 15 of these semester hours (which may include thesis credits) must be in animal industries courses; if the student submits a research paper, 20 of these semester hours must be in animal industries courses. 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).

Students who do not meet the undergraduate requirements may correct these deficiencies while an unclassified student or with the consent of the department during his graduate program. 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 his 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 this chapter.

The School of Agriculture offers courses in animal industries as part of a residence-center program at Western Illinois University.

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, 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 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.

A special strength in art and anthropology may be gained by including Anthropology 404, 405, 570 or 571, six hours of practical work in art in any one of Art 400 to 406, 414, 500 to 506, and 514, as well as Philosophy 560.

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 hopes to create a flexible program which will cater to students with diverse needs and goals.

Admission application forms should be obtained from and returned to the Graduate School. In addition, the student must provide three letters of recommendation and a personal statement of aims and interests; these materials should be forwarded directly to the director of graduate studies in the Department of Anthropology. No special program of previous work is required. Applicants with academic degrees in fields other than anthropology are encouraged to apply.

The Program

In addition to the Graduate School requirements specified in this catalog, the following departmental requirements apply to all graduate students in anthropology: 1) In one period of four semesters, the completion of a minimum of eight graduate level courses; these courses should include at least one from each of the major sub-fields of anthropology. 2) The completion of Anthropology 400D, or its equivalent, and Anthropology 409. 3) A demonstrated reading competence in a language foreign to the student. 4) The acquisition of some formal experience in teaching.

Each Spring semester the department administers a written preliminary examination which all students are expected to take during their first year; a student failing to take the examination during the first Spring semester in residence shall be considered to have withdrawn from the program. The first part of the preliminary examination is designed to assess the student's critical and analytic abilities; the second part samples the student's knowledge of the sub-fields of anthropology. After the faculty has evaluated the first part of the preliminary examination as well as the student's total academic record, the student is granted or denied approval to continue in a degree program. After evaluating the second part of the examination, the faculty may direct the student to correct specific sub-field deficiencies.

Master's Degree Program

A student approved for the M.A. program will select a three-person faculty committee to assume major responsibility for advisement and future guidance. For details on the procedures involved, the student should first consult with the director of graduate studies.

In addition to Graduate School regulations, the following provisions apply for the M.A. degree: 1) Completion of a total of 30 hours of graduate course credit; only three credits in Anthropology 599 may be counted toward this minimum. 2) Instead of a thesis, one may submit a published paper, or a paper accepted for publication in an approved professional journal; or one may be authorized to substitute a research paper for a thesis or published paper. 3) In addition to copies required by the Graduate School, one copy of the M.A. thesis, published paper, or research paper must be deposited with the department.

Conservation Archaeology

The M.A. with a concentration in conservation archaeology is designed to prepare the student for the increasing employment opportunities in the administration and direction of 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 linguistic section of the preliminary examination's second part. 2) A special examination in basic anthropology and archaeology is required. 3) Statistics may be substituted for the foreign language requirement. 4) Although a thesis is normally required, students continuing into the Ph.D. program may be permitted a nonthesis alternative.

Any student entering the Ph.D. program after obtaining an M.A. degree in conservation archaeology must complete the linguistic section of the preliminary examination and meet the foreign language requirement.

The required 30 credit hours for an M.A. in conservation archaeology include Anthropology 400C, 400D, 404 or 405, or an approved substitute, 406, 409, 430A, and 6 hours of 599.

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.

Doctor of Philosophy Degree Program

After completing the equivalent of the master's degree, the student applies directly to the Graduate School for admission as a doctoral student. Three letters in support of the application should be forwarded to the director of graduate studies in the Department of Anthropology.

After admission to the doctoral program, the student forms a faculty committee; for details on the procedures involved, the student should first consult with the director of graduate studies.

The requirements for the Ph.D. degree include: 1) Additional course work in anthropology and other fields within the student's interests; the Ph.D. committee is expected to help formulate a study program that will usually involve at least an additional academic year of full-time course work beyond the M.A. 2) Research tool requirements will vary and will be determined between the student and the committee; in all cases a reading knowledge of at least one foreign language will be required, but other tools could include, for example, computer science, statistics, biometrics, a second language, or any combination of these. 3) Within a period not to exceed three years of full-time graduate work, the committee will administer a three-hour special oral examination covering topical and geographical special-

ties. 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 a retake of the examination at a later time, or fail the student and request dismissal from the program.

Ph.D. candidacy. After completion of the above requirements, the department will recommend a student to the Graduate School for candidacy. The candidate will normally undertake problem-oriented field research to acquire materials for the dissertation. Candidates must register for 24 hours of credit in Anthropology 600.

When the dissertation has been accepted by the Ph.D. committee, an oral defense will be held in accordance with Graduate School requirements. Two copies of the dissertation must be filed with the Graduate School and one with the Department of Anthropology.

Art

The School of Art offers graduate studies leading to the Master of Fine Arts degree in art with a concentration in studio, and offers studies constituting a teaching specialty in art for the Master of Science in Education degree in secondary education. The student is expected to select an area of study (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 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

Credit hour requirements for the Master of Fine Arts degree in art with a concentration in studio (painting, printmaking, drawing, sculpture, ceramics, metal-smithing, and fibers), are a minimum of 48 semester hours, and all hours that are to count towards graduation must have the approval of the student's major adviser in studio specialty. The length of time required to complete a 48 semester hours program is usually 4 semesters or 2 academic years. Most graduate students are in residence for 4 semesters, but the minimum residency requirement is 2 academic semesters. Programs of residency must have the approval of the student's major adviser.

Required hours are distributed as follows: 20 hours in the major field (studio specialty), 9 hours in art history or related subjects, 6 hours in thesis or terminal project work, and the remainder in electives. Elective hours may be completed within any discipline in 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 studio specialties 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 in secondary education with a teaching specialty 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.

Biological Sciences

A student may pursue a program of studies leading to the Master of Science degree 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 chairman of the biological sciences committee or his designated representative.

Requirements for the Master of Science Degree 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 in biological sciences in the College of Science.

Additional information may be obtained from the director of the graduate biological program, Department of Zoology, SIU, Carbondale, Illinois 62901.

Botany

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. The Department of Botany offers graduate programs leading to the Master of Arts, the Master of Science, and the Doctor of Philosophy degrees in botany. Teaching experience in undergraduate courses is expected as part of the Ph.D. degree program.

Admission

Students must be admitted to the Graduate School before they can be considered by the department. All applications to the department must include three letters of recommendation, transcripts, application form, and may include a financial assistance form. Criteria for admission include grade point average, transcript analysis, 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.

Advisement

Following admission to the department and before registration for course work, the student must consult the staff member representing the field of major interest or, if this is unknown, the graduate adviser 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 should select a faculty member who is willing to serve as the major adviser. The major adviser in consultation with the student, the graduate adviser, and the chairman of the department will then select an Advisory Committee with the major adviser as chairman. For the master's degree program a minimum of three persons shall make up the advisory committee. The advisory committee for the Ph.D. program will be composed of five persons, one of whom will be selected from a discipline other than botany.

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.

Academic Retention

In addition to the retention policies of the Graduate School, the Department of Botany requires that each student must maintain an overall grade point average of 3.0 ($A = 4.0$). Upon falling below this average, the student will be allowed two academic terms to bring the average up to 3.0; failing this the student will be dropped from the program and not be allowed to re-apply. 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 graduate students shall be required to enroll in and take part in the departmental seminar each term. In case of an unavoidable scheduling conflict, the student must register for a departmental seminar in another appropriate department of biological sciences. Audited courses may not be counted toward completion of any minimum requirements of the department.

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, 10 hours of which may be research and thesis, and 3 hours of which may be seminar. 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 the ETS examination in a foreign language.

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. 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 statistics, computer programming, or research photography 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.

Diagnostic Examination. A written examination will be given to each entering student. The examination will be offered during the fall term each year, will last about three hours, and will cover the areas of anatomy-morphology, ecology, taxonomy, genetics, and physiology. The graded examination will be given to the student's adviser and is to be used in planning the student's program (this examination is not to be construed as replacing any part of the preliminary examination nor is it to be used as a qualifying examination).

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 Departments of Accountancy, Administrative Sciences, Finance, and Marketing of the College of Business and Administration, offers graduate work leading to the Master of Business Administration degree. The M.B.A. program has as its objective the development of professional managers and executives to serve the needs of business and government and to prepare interested graduates for doctoral study. The program has been structured with flexibility so as to serve holders of baccalaureate degrees in business administration as well as those who hold degrees in other disciplines.

Admission Requirements

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 30 semester hours of course work is required. Students also must complete successfully (maintain at least a 3.0 average) BA 598, and four of the following courses: BA 501, 510, 530, 540 and 550. The course in business policy, BA 598 is taken during the student's last semester and includes a study of a number of comprehensive cases, managing aspects of a simulated business in a competitive environment and a final examination. Candidates who receive permission to write a thesis must complete a minimum of 27 semester hours of course work plus an acceptable thesis for which 6 semester hours of credit are assigned.

Students who enter the 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 prior to starting the program of course work. These students may be required to complete as much as 30 additional semester hours of acceptable course work.

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 associate dean for graduate programs, College of Business and Administration. Candidates must satisfy requirements in the following areas: business policy, financial management, managerial accounting marketing, operations research, organizational behavior and research methodology.

The candidate may select a concentration, not to exceed 15 semester hours of credit in accountancy, or 12 semester hours of credit in administrative sciences (personnel or production), finance, or marketing. The candidate may also choose various 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, transfer credit shall be permitted for up to nine semester hours for incoming students only, but under no

circumstances can the stated minimal number of hours required within the program for graduation be reduced as a result of the acceptance of incoming transfer credit. A decision on whether to accept the course proposed for transfer credit shall be at the option of the associate dean for graduate programs, College of Business and Administration.

No transfer credit shall be permitted for any student who voluntarily departs from campus after beginning the program unless, and until, the student petitions the graduate programs committee of the College of Business and Administration stating the reasons for the request for transfer credit, and receives, from the committee, permission for the transfer. In any case the approved transfer credit may not exceed three semester hours but shall be counted in meeting the stated minimal number of hours required within the Program for graduation.

Academic Retention

In addition to the retention policies of the Graduate School, a student enrolled in the MBA Program who receives a third grade of *C* or lower in graduate or deficiency courses shall be automatically dismissed from the Program. If the third grade of *C* or lower is received in any term or session subsequent to, or concurrent with, the student having attained 24 or more semester hours of 500-level course credit, the student may petition the graduate programs committee of the College of Business and Administration for permission to remain in the Program.

If, for any reason, students who at the end of any term or session have three outstanding recorded grades of either Inc or Def or any combination thereof remaining on their record shall not be deemed to be making normal progress and shall be placed on probationary status. If, thereafter, the students have three outstanding grades of either Inc or Def or any combination thereof remaining on their records at the end of any subsequent term or session, the student shall be dismissed from the Program.

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 MBA degree. Upon completion of the requirements for the bachelor's degree, the student may apply for admission to the Graduate School and the MBA 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 30 semester hours of courses that meet M.B.A. requirements. In addition, the student must fulfill all other require-

ments of the School of Law, the Graduate School, and the program in business and administration for the J.D. and M.B.A. degrees.

Business Education

(see Vocational Education studies for program description)

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 undergraduate student must 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 and one course of inorganic chemistry.
2. One year of organic chemistry (lecture and laboratory).
3. One year of analytical chemistry, including introductory instrumental techniques.
4. One year of calculus-based physical chemistry (lecture and laboratory).
5. No less than a formal course of one year's duration in one of the following languages, French, German, or Russian.

Core Courses. All chemistry graduate students who are admitted unconditionally must take and complete all of the graduate core courses during their first year of residence. Students, particularly those entering with master's degrees, who have had prior exposure to the material contained in the core courses may take proficiency exams for these courses during the week prior to the beginning of the courses. These examinations will be equivalent to the final examination in the course and a grade of 75% or better will be required for students to successfully proficiency out of taking the course. Students are expected to maintain *at least* a B average in these courses. Their performance in this core will be evaluated by the faculty meeting as a committee-of-the-whole. The faculty will recommend (a) termination (giving cause), (b) continuation in a terminal M.S. Degree program, (c) continuation in the M.S. Degree program with the option of petitioning for admission to the Ph.D. program upon completion of M.S. Degree, (d) continuation in the M.S. Degree program but allowed to petition for a masters degree equivalency when all M.S. requirements except thesis are fulfilled, and then enter the Ph.D. program directly, and (e) continue in the Ph.D. program if an M.S. was earned prior to enrollment in our program.

Research Tools. There is no departmental requirement of research tools. However, a student's graduate committee, taking into account the student's background and the requirements of his research area, may require a student to acquire one or more research tools (e.g. foreign language, computer programming, statistics, etc.).

Research, Practicum and Training Assignments. All graduate degree programs require research. In addition, the student, each term, must work on a professional training assignment. This assignment may include practical teaching of chemistry, special training in the operation of research instruments or assignment to a specific research project. The assignment varies according to the needs, professional goals, and competencies of the student. The student is required to enroll in

Chemistry and Biochemistry 597 — Professional Training — for one credit hour each semester in residence.

Requirements for Master of Science Degree

In addition to meeting the general requirements of the Graduate School, a candidate for the Master of Science degree in chemistry is required to:

1. Fulfill core course requirements.
2. Earn six credit hours at the 500-level in formal course work in one of the five basic fields of chemistry, (Chemistry 451a,b, may be taken in place of one (1) 500-level biochemistry course). Core courses will not fulfill this requirement.
3. Earn 27 hours credit in chemistry courses, or 20 hours in chemistry if an outside minor is elected. A total of 30 semester hours is needed for graduation of which 15 hours must be at the 500 level.
4. Maintain a 3.00 grade-point average.
5. Attend weekly seminars and earn one hour credit (Chemistry 595) by presentation of a seminar.
6. Earn a minimum of 8 hours in research and thesis (Chemistry 598 and 599).
7. Demonstrate competence in a Research Tool if required by the student's committee.
8. Prepare and present a thesis on the research carried out.
9. Schedule and pass a final oral examination. Copies of the thesis must be distributed to the members of the Graduate Committee at least one week prior to the examination.

Requirements for Doctor of Philosophy Degree

A. Students entering the Ph.D. program must either have a master's degree in chemistry or must have a master's equivalency as defined by the Graduate School. In addition, all students in the Ph.D. program must:

1. Fulfill core course requirements.
2. Complete a course of study as determined by their graduate committee.
3. Earn one hour credit in seminar (Chemistry 595) beyond the master's degree requirement, and attend weekly seminars.
4. Earn a minimum of 32 hours in research and dissertation (Chemistry 598 and 600).
5. Pass cumulative examinations.
 - a. After having fulfilled all the core course requirements candidates may begin taking cumulative examinations. Graduate students holding a master's degree in chemistry may proceed with the cumulative examinations in those areas in which they have passed the diagnostic examination.
 - b. Students may elect to take cumulative examinations in their major area only, or they may elect to take cumulative examinations in different areas. If the latter course of action is elected, the chemistry department graduate advisers must be informed of the intention to pursue a cross-area curriculum at the time the research director is selected. It is the responsibility of the student's graduate committee to determine how the cumulative examinations are to be divided among the several areas. However, in no case can the total cumulative examination requirement be less than stipulated below.
 - c. Ten examinations are to be given each calendar year with four examinations respectively in the fall and spring semester and two examinations in the summer semester. Cumulative examinations may be written examinations 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 examination simultaneously. The time and place for the examination will be posted at least ten

days before an examination. The subject of an examination may be announced in advance of the examination. Students must register to take the examination at least one week before it is scheduled.

- d. A student must pass five examinations in no more than fourteen trials in order to continue for the Ph.D. degree. A student must take consecutive examinations. They are urged to begin as soon as they are eligible. He is not liable for examinations during any time they are not enrolled in school.
 - e. 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. Students taking the examination will be notified in writing whether or not they passed the examination. 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 exam coordinator.
6. Pass Preliminary oral examination following completion of the cumulative examination requirements.
 7. Maintain a 3.25 grade-point average.
 8. Demonstrate competence in a research tool, if this is required by 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 the 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.

Cinema and Photography

The Master of Fine Arts degree in cinema and photography is intended to provide substantial advanced training to 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. Within the program students can elect to specialize in cinema production, professional photography, or fine arts photography.

Acceptance in 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 department regarding admission procedures. 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 three areas of specialization 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 specialize 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 specialize in cinema have a course-work background equivalent to Cinema and Photography 355, 356, 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. Normally the first year would be spent completing advanced course work in the Department of Cinema and Photography and other departments. 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 and be subject to criticism from both within and without the program before the department would consider this requirement satisfied.

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

Degree requirements are 52 semester hours, including 26 hours at the 500 level, and 12 hours of production courses in the area of specialization during the first year in residence.

Required courses are:

Professional Photography Specialization—four of the following:

- 403-3 Studio Portraiture
- 405-3 Commercial/Industrial Photography
- 406-3 Advertising/Illustrative Photography
- 407-3 Publications Photography I
- 408-3 Publications Photography II
- 415-3 Technical and Scientific Photography
- 418-3 Documentary Photography
- 470B-1—9 Advanced Studies in Photography

Fine Arts Photography Specialization—four of the following:

- 420-3 Experimental Camera Techniques
- 421-3 Experimental Darkroom Techniques
- 422-3 Advanced Color Photography
- 423-3 Reconstruction of Color
- 425-3-9 Studio Workshop

Cinema Production Specialization

- 455-3 Film Production III
- 456-3 Film Production IV
- 468-3 Advanced Film Theory
- 470A-1-9 Advanced Studies in Cinema

15 hours in a supporting field. This could consist of course work in a single field or be an interdisciplinary minor. In all cases, the student would design the supporting field and supply a rationale describing how it would contribute to their artistic development.

Four hours of the M.F.A. Seminar (Cinema and Photography 595).

At least 6 hours of M.F.A. Projects (Cinema and Photography 597).

At least 9 hours of Cinema and Photography electives. Beyond the 400-level C&P courses, the following courses would be acceptable to satisfy this requirement.

PVC 541A-3 Seminar: History of Photography

PVC 541B-3 Seminar: History of Photography

PVC 542A-3 Seminar in Film History

PVC 542B-3 Seminar in Film History

PVC 572A-2 Management of the Photographic Unit

PVC 572B-2 Management of the Photographic Unit

PVC 574-3 Contemporary Film Theory

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.

Community Development

The Master of Science degree program in community development is designed to enable students to obtain a broad understanding of the principles and practices of community development, to strengthen their ability to systematically analyze and understand processes of social change at several levels and to provide them with opportunities to develop competence in one or more of the established or emerging sub-specializations in the field. The 42 credit hour program consists of a core of required courses, a field internship, a minor concentration and a terminal masters option related to this concentration. The core courses expose all students to a common body of knowledge about the field, about social change and about purposeful strategies of change; the internship allows students to apply this knowledge in a practical community development project; while the minor concentration and terminal option sequence allows students to develop special competence related to individual career objectives in the community development field.

Prerequisites

Social Science: three college-level courses with a grade of *C* or better in at least two different disciplines.

Social Statistics: three semester hours at either the undergraduate or graduate level.

Community Development Core Requirements (28 semester hours)

CD 401, Introduction to Community Development, 3.

CD 500, Research Seminar in Community Development, 3.

CD 501, Small Group Process in Community Development, 4.

CD 502, Community and Change, 3.

CD 503, Problems of and Approaches to Community Development, 3.

CD 589, Professional Seminar in Community Development, 2.

CD 595, Internship, 5.

Terminal option: thesis, research report, extended minor or master's project. These five hours may be earned in one of the following ways:

a. CD 599, Thesis Research, 5.

b. CD 593, Individual Research in Community Development (for research report or master's project), 5.

c. Five semester hours in 400- or 500-level courses in addition to the nine hours in the regular minor (for extended minor), 5.

Other Course Requirements (14 semester hours)

a. Minor concentration. At least nine hours in 400- or 500-level courses in one or more disciplines constituting either an exceptional concentration designed by

the student and approved by the department or one of six department-designed concentrations in CD administration, education, organization, planning, research, and training.* Concentrations typically consist of approved courses outside the department, except for a CD elective required in planning and in research, or occasionally in a student-designed exceptional concentration, 9.

- b. Electives. Additional 400- or 500-level courses in minor, in elective CD courses or other departments as needed to total 14 hours outside the core requirements.

Elective Community Development Courses

Depending upon career objectives, a student may take several CD or other courses, even over and above the required 42 hours in the curriculum.

Available CD electives are:

- CD 402, Comparative Community Development, 3.
- CD 403, Citizen Roles in Human Services, 3.
- CD 404, Role Theory and Analysis in Community Development, 3.
- CD 405, Social Planning, 3.
- CD 491, Independent Study in Community Development, 1-6.
- CD 497, A-E, Seminars in Community Development, 1-12.

Field Internship

The field internship is a requirement for the M.S. degree in community development. It consists of approximately 250 clock hours of supervised work in a community development project. The objective of the program is to provide a field experience in which the intern can test and develop his skills; can demonstrate personal and professional growth and capacity for growth; and can increase his ability to reflect on and conceptualize his learning experience. CD 589, Professional Seminar in Community Development, must be taken before or concurrently with the field internship.

Terminal Options

There are four possibilities for a terminal project. They are: (1) a master's thesis, (2) a terminal research report, (3) an extended minor, and (4) a master's project. These four possibilities are described below. In each case the terminal option must be related to the student's minor concentration.

Thesis

1. General description. The thesis involves substantial new research. A research prospectus will be prepared and submitted to the student's committee for approval. Then the research will be done and the final report written. Finally, the student will be examined orally upon both knowledge of community development and the quality of the thesis.

The thesis requires a form filed in duplicate with the department specifying the student's committee and thesis topic. The original and one copy of the completed thesis are filed with the dean of the Graduate School. One copy is filed with community development and one copy is given to the chairperson of the student's thesis committee. Thus, four copies of these are required.

2. Composition. The thesis committee consists of three persons, as follows:
 - a. A chairperson from community development who is on the graduate faculty.
 - b. One member from community development who is on the graduate faculty.
 - c. One member from a department other than community development who is on the graduate faculty.

*Lists of recommended courses in these concentrations are maintained by the department.

3. Composition of the oral examination committee is the same as the thesis committee.

Terminal Research Report

1. General description. The research report may be a new work or an extension, elaboration, or broadening of a paper already done by the student. As for the thesis, a research prospectus submitted to and approved by the student's research report committee will be required before the research itself is undertaken.

The terminal research report requires a form to be filed in duplicate with the department specifying the student's committee and terminal research report topic.

One copy of the completed research report is filed with community development, one copy is submitted to the Graduate School, and a third copy is given to the chairperson of the student's terminal research report committee.

2. Composition. The terminal research report committee consists of a chairperson from community development who is on the graduate faculty, plus one of the following two options:
 - a. Two additional persons both from community development.
 - b. Two additional persons, one from community development and one from another department who is on the graduate faculty.
3. Composition of the oral examination committee. All members on the terminal research report committee serve on the orals committee. However, since the Graduate School requires three persons who are on the graduate faculty for the orals committee, it will sometimes be necessary to increase the size of the orals committee to meet this requirement. In such a case one or two persons from community development staff who are on the graduate faculty will be added to the terminal research report committee to constitute the oral examination committee.

Extended Minor (14 or more credit hours)

1. General description. To complete an extended minor, the student must take five hours of course work outside community development in addition to the normal minimum of nine hours devoted to the minor concentration. Since the student also has 5 hours which are elective, as many as 19 hours may be accumulated in an extended minor. The student must also complete a paper linking the extended minor to community development.

This minor may not be merely 14 or more hours of randomly selected courses. There must be a focus, and the focus and its validity will be developed under the guidance of the student's extended minor committee. The student will design an extended minor program complete with a list of the courses and a justification for proposing them for approval by the student's extended minor committee.

The extended minor requires a form to be filed in duplicate with the department specifying the student's committee and minor. One copy of the completed terminal option paper is filed with community development, one copy is submitted to the Graduate School, and a third copy is submitted to the chairperson of the student's extended minor committee.

Upon completion of the extended minor, the student will be examined orally for general knowledge of community development, for knowledge of the extended minor field, and for understanding of the relationship between community development and the minor field.

2. Composition. The extended minor committee will be made up of a chairperson from community development who is on the graduate faculty, one person who is on community development staff, and one person from outside community development to represent the extended minor and who is on the graduate faculty.

3. Composition of the oral examination committee. This committee will be formed in the same way as the oral examination committee for the terminal research report. All members of the extended minor committee will be on this committee. Persons from community development who are on the graduate faculty will be added as necessary to total at least three persons who are on the graduate faculty.

Master's Project

1. General description. The master's project is designed to allow the student to engage in a community development field project. The student conceptualizes, designs, and implements the project. Upon termination of the project, the student writes an analytical report on it. Examples are: consumer cooperatives, community health programs, economic development programs, human relations training laboratories.

Several of the features of the master's project which distinguish it from an internship are as follows:

- a. The student shows the major initiative in developing the project and is therefore expected to prepare a formal prospectus describing it.
- b. The project can be conceptualized as having a fairly definite structure with a beginning, middle, and end.
- c. Whereas the internship stresses learning and growth, the master's project should stress opportunity for the student to demonstrate independently a high level of professional competence in community development.

A project prospectus submitted to and approved by the student's master's project committee is required before the project itself is undertaken.

The project requires a form to be filed in duplicate with the department specifying the student's committee and the title of the project.

Upon completion of the project, the student will prepare a final report to present to the master's project committee and will then have an oral examination on general knowledge of community development and the master's project.

One copy of the final project is filed with community development, one copy is submitted to the Graduate School, and a third copy is given to the chairperson of the project committee.

2. Composition of the master's project committee. This committee consists of three persons from community development, one of whom is designated as chairperson.
3. Composition of the oral examination committee. This committee will be formed in the same way as the oral examination committee for the terminal research report. It will include all members of the master's project committee plus as many persons as necessary from community development staff who are on the graduate faculty to total three graduate faculty persons.

Oral Examination Committee

It is desirable to have the oral examination committee and the terminal option committee be as nearly as possible the same persons. Regardless of the composition of these committees, however, consensus must be reached by the orals committee on approving satisfactory completion of the general examination and terminal option.

Computer Science

The Department of Computer Science offers a graduate program leading to the Master of Science degree in computer science.

Application forms for admission to the Graduate School and thereby to the computer science program may be obtained from the Graduate School. Decisions

concerning the admission of students to and their retention in the graduate program will be made by the department faculty subject to the requirements of the Graduate School. The department does not have any specific grade point average requirement for admission beyond the Graduate School minimum, but the students' academic record will be examined for evidence that they can meet the standards required of graduate students.

An undergraduate major in computer science is not required for admission and students with majors in other fields are accepted. The student applying for admission will be expected to have completed a standard sequence in calculus. There are no other formal course requirements for admission. However it should be understood that a student with minimal background may be expected to take additional work on a deficiency basis.

Requirements

The requirements for the M.S. degree include a minimum of 30 hours of graduate credit. However, the actual number of hours which the student must take is dictated by the degree of preparation the student has at admission. The extent of this preparation is generally defined by the number of core courses (or equivalents) which the student has taken prior to admission and hence need not repeat as a graduate student in the program.

1. Core Requirements

- a. Each of the CS courses: 401, 411, 414, 430
- b. Each of the CS courses: 445, 451, 464a
- c. One of the CS courses: 470, 471, 472
- d. Mathematics 417 or 421
- e. Mathematics 480

2. Group Requirements

With respect to the following three groups of courses, the student is required to take at least six hours from one group and at least three hours from each of the remaining groups:

Group a: CS 553, 555

Group b: CS 501, 514, 516

Group c: CS 531, 536, 564

3. Other Requirements

- a. The student will be required to write a thesis or research paper carrying credit under CS 599 or CS 592. The option chosen requires department approval.
- b. At the completion of his work, the student will be given a final oral examination over his thesis and other topics.

Curriculum, Instruction, and Media

The Department of Curriculum, Instruction, and Media offers graduate programs leading to the Master of Science in Education degree in the following areas: early childhood education, educational media, elementary education, and secondary education. The department also provides courses leading to the Doctor of Philosophy degree in education (see page 59).

Requirements for admission to graduate programs are described earlier in this bulletin under the Graduate School, Master's Degree Program.

Master's Degree

The master's degree program in each of the four above concentrations requires a minimum of 32 semester hours for completion. Each candidate's program is planned through a faculty adviser and, if a specialty is involved, also in cooperation with the department of the candidate's teaching field.

The student completes a program by satisfactorily finishing all course require-

ments and passing either the oral examination over the thesis or the master's degree comprehensive examination. The comprehensive examination is scheduled to be administered on Saturday of the ninth week of each semester during the regular academic year and on Thursday of the third week of the summer session.

No more than 11 semester hours of credit earned at another college or university may be accepted toward requirements for this degree. The students' academic programs are planned in consultation with their advisers on the basis of interests, experiences, and areas of specialization. Unclassified graduate students should see the master's degree coordinator for information and advice.

EARLY CHILDHOOD EDUCATION

The master's degree program in early childhood education focuses on preschool through grade 3. Students in the program must complete at least 16 hours of course work at the 500-level and meet core requirements, research requirements, and supportive field requirements. Core requirements (15 hours) include Guidance 422 and 562A and CIM 419, 513, and 518. Research requirements (3-9 hours) include: (1) CIM 500 and a research paper or (2) CIM 599 (Thesis). Supportive field requirements of 5 hours must be course work which undergirds early childhood education and must be agreed upon by the student and the assigned adviser.

For the research requirement, a student may elect either (1) to write a research paper dealing with some aspect of early childhood education under the guidance of a faculty adviser and to take the early childhood education master's degree comprehensive examination, or (2) to write a master's thesis under the guidance of a three-person committee which includes the student's adviser and take an oral examination over the thesis given by the thesis committee.

Students desiring preschool certification must be admitted to the Teacher Education Program and follow the preschool entitlement process established for Southern Illinois University, without receiving graduate credit. Those desiring K-9 certification must also be admitted to the Teacher Education Program and complete the appropriate Teacher Education Program requirements, without graduate credit.

EDUCATIONAL MEDIA

The master's degree program in educational media requires a minimum of 32 semester hours for completion. Students may elect to write either a thesis, a research paper, or a research paper/project for the degree. Students are given a final oral examination before graduation.

For this course of study, at least 15 hours of credit must be completed in courses at the 500 level or above. The only required course is a course in research methodology. Courses are offered to meet the requirements for entitlement to the Standard Special Certificate in all area of media issued by the Illinois Office of Education. Specializations are also available in instructional development, instructional television, media production, and community college librarianship. It should be noted that in Illinois every media specialist in the public schools is also required to hold a teaching certificate.

Work taken as qualifying work for admission to the Graduate School may not be counted toward the degree program in educational media. A minimum of 16 hours counted toward the degree must be taken in the educational media program at SIU. At least 16 hours must be earned at SIU after admission to the educational media program. Work taken during the semester of admission may be included in this total upon approval of the educational media program faculty.

Courses in the administration, organization, utilization, and production of educational media are designed to train media specialists who can administer all educational materials. Courses often include laboratory work, field trips, and

practical experiences. Specialized courses in library science and audio-visual education provide a means for students to enrich their studies. Graduates of the program have been employed in elementary and secondary schools, and community colleges and in college and university teaching, industry and business, military, and religious education.

ELEMENTARY EDUCATION

Students enrolling in the elementary education master's degree program must complete at least 15 hours of course work at the 500 level and meet core requirements, research requirements, and specialization requirements. Core requirements (5-6 hours) include CIM 531 and one of the following: Guidance 422, 502, 506, 562A, and CIM 511. Research requirements (3-9) hours) are (a) CIM 500 and a research paper or (2) CIM 599 (Thesis).

For this degree a student may follow a general elementary education program or a program with a specialization in one of the following areas: language arts, mathematics, reading, science, social studies, supervision, or curriculum. A student selecting a specific program and specialization is required to have the program approved by an adviser from that area. A student who selects the area of supervision and successfully completes the M. S. degree will qualify for the General Supervisory Certificate offered through the Illinois Office of Education.

For the research a student may elect (1) to write a research paper under the guidance of a faculty adviser and to take the departmental master's degree comprehensive examination or (2) to write a master's thesis under the guidance of a three-person committee which includes the student's adviser and to take an oral examination over the thesis given by the thesis committee.

Students desiring certification for K-9 must be admitted to the Teacher Education Program and must complete, without graduate credit, a minimum of the following: Education 301, Educ. 302, CIM 312, and at least two courses selected from CIM 315, 423, 424, and 426. In addition, uncertified students must complete at least 5 semester hours of student teaching, done in residence at a college or university approved by the National Council for Accreditation of Teacher Education.

SECONDARY EDUCATION

Students who enroll in the secondary education master's degree program must successfully complete a minimum of 13 to 19 semester hours of graduate level work in education courses in those programs which involve a teaching area emphasis, plus 13 to 19 hours of graduate work in their teaching specialty. Special programs planned for those students whose previous experience or preparation or professional goals warrant special consideration must involve at least 32 hours of graduate work.

Core requirements (6 hours) are: CIM 580, and CIM 571. The research requirement consists of successfully completing CIM 500 or its equivalent during the first 15 semester hours of the program and either completing CIM 593 for 2 semester hours or writing a thesis. If students elect CIM 593, they and the professors in charge of the research agree upon the research problems and determine the conditions for completing the study. If they elect to meet the research requirement by preparing the theses, they will each be assigned a committee of three professors who will plan with them for the writing of the theses. The committee will also serve as the examination team before whom the thesis is defended. Thesis credit up to 4 hours may be granted.

The secondary education comprehensive examination is taken by those students who do not write theses. It is a two-part examination which covers (1) the area of secondary education and (2) the students' teaching specialty or special area of

concentration. The student may elect to take the examination after completion of 21 semester hours of course work.

Specialist Degree (Elementary Education or Secondary Education)

The Department of Curriculum, Instruction, and Media offers two Specialist degrees, one in elementary education and one in secondary education. These degree programs are designed for teachers and other personnel who seek specialized performances of teachers in general.

Admission. Applicants for admission to the Specialist program must meet minimum Graduate School standards for admission to and retention in the Specialist degree program. No more than 6 semester hours earned at another college or university may be accepted toward requirements for the Specialist degree. At the time of acceptance into the program, an advisory committee of three professors will be appointed to design the program cooperatively with the student, supervise the field of 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 specialization.

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. Each program requires curriculum and seminar courses from the appropriate discipline (5 or 6 semester hours), a field study (2 to 6 semester hours), and specialization hours and electives as determined by the student and the advisory committee. Prior to graduation a written report of the field study must be submitted to the committee for approval and transmitted to the Graduate School.

Early Childhood Education

(See Curriculum, Instruction, and Media for program description)

Economics

Graduate courses in economics may be taken as a major or minor leading to the Master of Arts, Master of Science, or Doctor of Philosophy degrees in economics. In addition to Graduate School admission standards, the Department of Economics requires completion of the verbal, quantitative, and advanced economics portions of the Graduate Record Examination except where it may create a hardship for international students.

Master's Degree

Either the M.A. or M.S. degree requires successful completion of 30 semester hours of graduate work. Of this total, at least 15 hours must be at the 500 level and at least 21 hours must be in economics courses. There are required courses in statistics, macro and microeconomic theory. In addition to these stipulations, the master's degree can be attained in one of three ways. A thesis may be written, for which the student may receive a maximum of 6 hours credit toward the total of 30 hours.

A second option is to include, as part of the 30 hours, Economics 510, research in economics. A third option is to take and pass the qualifying exam for the Ph.D. degree. Each of the latter two options also requires the submission of a research paper. Candidates for the M.A. degree must also demonstrate proficiency in one of the foreign languages acceptable for the Ph.D. degree at the level prescribed for

that degree. Students who intend to enter the doctoral program should take the remaining courses of preparation for the qualifying exam. These consist of the seminar in economic thought and advanced work in micro and macroeconomic theory.

Doctor of Philosophy Degree

The Ph.D. degree prepares the student for teaching and research positions in the academic world, for positions as economist in private industry, for positions with private research or consulting organizations, or for government positions requiring advanced economic training.

The degree is awarded for high accomplishment as evidenced by these steps:

1. Demonstrating proficiency in statistics as a research tool through successful completion (minimum grade of *B*) of Math 480 and 481 or Math 483 and 488 or Math 514 and 515 or Math 483 and Economics 567a.
2. Demonstrating proficiency in a second research tool chosen, with prior consent of the director of graduate studies, from one of the following:
 - a. A foreign language: proficiency as demonstrated by successful completion of the Education Testing Service Examination or by passing the appropriate foreign language 288a and b with a grade of *A* or *B* in each course.
 - b. Mathematics: completion of the second year calculus sequence, plus one additional course at the 400 level or one 300 level course selected from Mathematics 301, 305, 352. Each course must be passed with a grade of *B* or better.
 - c. Any two courses at the 400 or 500 level in an area other than mathematics that is closely related to economics and each passed with a grade of *B* or better.
 - d. Computer programming: the student should consult the director of graduate studies for the method of demonstrating proficiency.
3. Passing a written qualifying examination in economic theory and history of economic thought.
4. Passing written and oral preliminary examinations in three specialized areas chosen, with the prior consent of the director of graduate studies, from economic development, economic history, economic theory (two fields are available), econometrics, human resources, international economics, money and banking, political economy (two fields are available), or any graduate area outside economics but having a reasonable connection with economics.

Students are recommended for candidacy for the degree after they pass the preliminary examinations.

5. Completion of a dissertation based on original research and successful defense of the dissertation before a faculty committee.

More detailed descriptions of the graduate programs, as well as information on teaching and research assistantships and fellowships may be obtained from the director of graduate studies, Department of Economics.

Education

One may pursue a program of study leading to the Doctor of Philosophy degree in education through any of thirteen approved concentrations: cultural foundations, educational administration, educational psychology, elementary education, guidance and counseling, health education, higher education, educational media, measurement and statistics, occupational education, physical education, secondary 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 are stated under each departmental heading. Educational psychology, guidance and counseling, and measurement and statistics are offered through the Department of Guidance and Educational Psychology. Cultural foundations and educational administration are offered through the Department of Educational Leadership. Elementary education, educational media, and secondary education are offered through the Department of Curriculum, Instruction, and Media. Occupational education is offered through the Department of Vocational Education Studies.

For program descriptions of Master of Science in Education degrees and Specialist degrees, the student should consult the appropriate department in this chapter.

Application

Applicants must submit the standard application materials to the Graduate School. Any data required in addition to the standard Graduate School application materials are described under the appropriate departmental headings below.

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 recommendation to the Graduate Affairs Committee of the College of Education; this committee makes the final admission decision. Retention standards beyond minimum Graduate School standards are established by each department or concentration.

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*. 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 associate dean for graduate studies in 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 psychological foundations of education (Educ. 591) and in social and philosophical foundations of education (Educ. 590). For each concentration there are also basic courses, listed below under the departmental headings, which are required beyond this core.

Research Competencies. Each concentration in the Ph.D. degree in education has its own research requirement.

Preliminary Examination. All students in the Ph.D. program in education must take the preliminary examination over areas determined by the department or 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 exam two additional times. If at that time the

student has not passed the examination, the student is dropped from the program.

Dissertation. The doctoral committee consists of a chairman 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 associate dean for graduate studies 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.

Satisfactory completion of the dissertation requirement includes the passing of an oral examination covering the dissertation and related areas.

DEPARTMENT OF CURRICULUM, INSTRUCTION, AND MEDIA

The Department of Curriculum, Instruction, and Media offers approved concentrations in educational media, elementary education, and secondary education.

Admission and Retention. The applicant must complete the departmental application form and select one of the three concentrations with the department. A selection and review committee of that concentration will screen the applicant on the basis of prior graduate work, grade point average, standardized test scores (Miller Analogies Test or Graduate Record Examination required), work experience, and letters of recommendation. The committee recommends admission of the student only if the concentration is willing to sponsor the applicant and a faculty member who is permitted to direct doctoral dissertations agrees to serve as chairman of the student's doctoral committee.

A student accepted by one concentration who wishes to change to another must resubmit his papers to the new concentration for consideration. A committee may possibly recommend for admission a student who shows some deficiency from department standards if, in its opinion, the student shows unusual professional promise.

Inquiries regarding admission to any of the three concentrations should be directed to the chairman of the Department of Curriculum, Instruction, and Media.

Prior to the completion of 30 hours of course work, the student meets with the doctoral program chairman to determine whether or not to continue as a doctoral student. Such matters as grade point average, progress in the program, and steadfastness of desire to attain original goals are considered. A report of this meeting is sent to the doctoral committee, the department chairman, the associate dean for graduate studies, and to the student. If the program chooses not to retain the student, the reasons are specified in the report.

Research Requirements. A minimum of one research requirement is selected by the doctoral committee from the following: (1) a reading knowledge of one or more foreign languages; (2) a demonstration of competency in educational statistics or successful completion of Guid. 506 and 507; (3) a demonstration of competency in computer programming; (4) another research competency at the discretion of the doctoral committee.

Preliminary Examination. The preparation and direction of the preliminary examination are the responsibility of the concentration and the student's doctoral committee. Twelve hours of testing are required. A portion of the examination is prepared by the faculty representing the concentration and a portion is prepared by the doctoral committee. Additional oral and written examinations may be required by the student's doctoral committee or by the concentration evaluation panel.

Oral Examination. The Department of Curriculum, Instruction, and Media re-

quires an oral examination, conducted by the doctoral committee. The examination covers the dissertation and also includes questions designed to ascertain the student's general competency in his concentration and specialty area.

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. Two copies of the abstract should be given to the associate dean for graduate studies in the College of Education.

Elementary Education

The doctoral concentration in elementary education offers a program that develops competencies for college and university teaching and research in various specializations. Requirements are balanced and flexible and utilize work in appropriate disciplines outside the College of Education.

Program Requirements. A minimum of 64 hours beyond the master's degree is required. A typical program consists of: (1) the doctoral core requirement in education (8 hours), (2) successful completion of CIM 532 (3 hours) before taking the preliminary examination, (3) completion of a minimum of 13 hours of work in the field of specialization with the concentration of elementary education, (4) at least 8 hours of cognate work which may be outside the College of Education, and (5) at least 24 hours of dissertation. The balance of the program will be in electives that have been selected to support the goals of the program.

Educational Media

The doctoral concentration in educational media is designed for those individuals who wish to become directors of educational media programs in large school systems, community colleges, colleges or universities, or industries in which the scope of the program will require, under the director, separate specialists in the audiovisual and library fields.

Program Requirements. The typical program consists of 64 semester hours above the master's degree arranged as follows: (1) doctoral seminars in education: 8 hours; (2) field of specialization: 32 hours; (3) dissertation: a minimum of 24 hours; work may be required in a cognate field or fields as a part of the 32 hour requirement.

Secondary Education

The doctoral concentration in secondary education offers a varied program to prepare the many specialties for public school teaching. The concentration also offers programs to develop competencies in college and university teaching and research in education.

Program Requirements. The typical program of studies consists of 64 hours above the master's degree arranged as follows: (1) doctoral seminars in education: 8 hours; (2) the departmental core in curriculum theory and instructional practices: 19 hours to include CIM 582, CIM 585a, CIM 585m, and CIM 586; (3) field of specialization and cognate study: 13 hours as approved by the doctoral committee; and (4) dissertation: 24 hours.

DEPARTMENT OF EDUCATIONAL LEADERSHIP

The Department of Educational Leadership participates in the doctoral program in education with approved concentrations in both educational administration and cultural foundations.

Inquiries regarding application to either program should be directed to the chairman of the Department of Educational Leadership.

Educational Administration

Admission and Retention. The following are criteria for admission to and retention in the program: (1) A graduate background, at the level of a master's degree major in educational administration, or its equivalent; (2) appropriate experience in an educational setting; (3) objective measures rated on a point scale developed by the department; i.e., graduate grade point and the Miller Analogies Test score; (4) subjective measures: recommendations from three or more persons knowledgeable of the candidate's ability to do advanced graduate work; and data gained through personal interview, if possible. An example of the writing ability of the applicant may also be required.

A minimum grade point average of 3.25 on a 4.0 scale is required for retention in the program. A student whose grade point average falls below 3.25 may take an additional nine semester hours of work if such work will correct the deficiency. If after nine hours, the student's GPA remains below 3.25, the student shall be dropped from the program.

Program Requirements. The doctoral program in educational administration normally includes a minimum of 64 semester hours of work beyond the master's degree as follows. The student is required to complete: (a) two doctoral seminars totaling eight semester hours common to all doctoral students in education; (b) a concentration of 16-22 semester hours including a required six-hour, two-course seminar in educational administration; (c) a cognate or interdisciplinary block of six semester hours which may be drawn from social and behavioral science fields as anthropology, economics, government, sociology, psychology, etc. (This work seeks to provide the student with an orientation to fields that are integrally related to educational administration); and, (d) a dissertation of 24-32 semester hours.

Research Tool Requirements. A minimum of one research competency is required of each student. Specific research competencies and procedures for evaluation are determined by the doctoral committee of each student congruent with the individual's professional preparation and goal expectations. Possible research tools might include: a statistics sequence, computer programming, foreign language(s), or other related and research oriented subjects and procedures.

Preliminary Examination. The student prepares for the examination through course work and independent study as advised by the doctoral committee. The examination covers the student's special area of concentration and research. The student's doctoral committee chairman initially solicits and compiles test questions in these areas, then meets with the department chairman to determine the completeness of the examination. If certain areas are judged to be inadequately covered, additional questions in those areas are solicited from appropriate staff members. Individuals submitting questions are responsible for evaluating the student's responses to such questions, although the entire examination is available to the total examining committee. After the evaluations, the entire examining committee meets to determine whether the student has passed part or all of the examination. If certain specialty responses are judged inadequate, the examining committee may require the student to re-write in the deficient area or to submit to an oral examination in the specialty.

Cultural Foundations

Admission and Retention. The admissions criteria include grade point averages,

Miller Analogies Test scores, letters of recommendation, and work experience. Students shall ordinarily have completed at least two years of successful teaching experience in the public schools, or its equivalent as determined by the foundations committee. If this requirement has not been fulfilled, the committee may make arrangements for a special internship program.

A GPA of at least 3.25 on the first 20 semester hours of course work is required for retention. This average must be maintained to program completion.

Program Requirements. The student is required to complete a program of at least 70 semester hours beyond the baccalaureate degree, not including 24 hours used in dissertation research. The program must meet the following minimal pattern: (1) 14 hours of professional education courses, including Education 590 and 591; (2) 24 hours in a specialization; philosophy of education, history of education, comparative and international education or educational sociology; (3) nine hours each in two minor areas selected from: philosophy of education, history of education, comparative and international education, and educational sociology; and (4) 14 hours of elective courses as determined by the sponsoring committee with the cooperation of the student.

Research Requirements. Each student must demonstrate research competence in one or two areas determined by the student and the committee. This might consist of the course sequence in statistics, foreign languages, historiography, etc.

Preliminary Examination. After the student has completed the doctoral seminar sequence, the research competencies, and made up any deficiencies indicated by the student's doctoral committee, the preliminary examination may be taken during the final term of course work or upon successful completion of 36 semester hours beyond the master's degree.

Materials to assist the student studying for the preliminary examinations may be secured from the faculty members asking the questions for the examination. These materials might include a bibliography or some suggestion of those areas the faculty member would hold to be essential to an understanding of that area of the cultural foundations of education.

The examination consists of six hours of written examination administered over two days, and two hours of oral examination. The written examination consists of two three-hour parts. Part one is from the student's principal specialization within cultural foundations of education and part two consists equally of questions from the student's two minor areas. The foundations committee determines who shall write the questions. Faculty members designing questions shall evaluate the responses and state the reasons for their acceptability or unacceptability. The oral examination committee consists of the faculty members writing questions and may also include members of the student's doctoral committee.

The oral examination is administered by the examination committee within two weeks after the written examination; the exact time is determined by the doctoral chairman with the consent of the oral examination committee. The oral examination has the following purposes: (1) To provide the members of the committee the opportunity to seek further evidence of the student's competence in three areas of foundations and in any other area deemed important by the members of the examination committee; (2) To clarify issues or responses raised by the written examination.

A student receiving an evaluation of unacceptable on any one part of the written examination may confer with the committee chairman and the evaluator of the question to determine further action, which might include a re-examination of the area judged unacceptable or the design of a special program to correct the student's deficiencies. Failure of the committee chairman and the evaluators to agree will be resolved by the foundations committee.

Failure to pass two or more parts of the written examination or the oral examination constitutes an overall rating of unacceptable. The foundations committee then decides what action shall be taken in regard to the student.

DEPARTMENT OF GUIDANCE AND EDUCATIONAL PSYCHOLOGY

The Department of Guidance and Educational Psychology offers approved concentrations in educational psychology, guidance and counseling, and measurement and statistics.

Application. Inquiries regarding admission to any of the three concentrations should be directed to the chairman of the Department of Guidance and Educational Psychology.

Admission and Retention. The applicant must complete the department form and select one of the three concentrations within the department. A selection and review committee of that concentration will screen the applicant on the basis of prior graduate work, grade point average, standardized test scores (usually the Miller Analogies Test or the Graduate Record Examination), and letters of recommendation. A student accepted by one concentration who wishes to change to another must re-submit these papers to the new concentration for consideration.

A student will not be permitted to take the preliminary examination unless a 3.25 grade point average is maintained in courses taken as a part of the doctoral program. Any student who has a grade point average below a 3.25 after 20 semester hours of doctoral level work, and before passing the preliminary examination, will not be allowed to continue in the program, nor will the student be considered for readmission at some later date. All students will be required to participate in teaching or research experiences as a part of their program without credit.

Program Requirements. Each doctoral student in the department must demonstrate competence in each of the three core areas by successfully completing specified courses: a. measurement and statistics (Guid. 506, 531); b. educational psychology (Guid. 511); and c. personality theory and human dynamics (Guid. 570).

Students may request proficiency credit for the competencies from the department chairman. The awarding of such credit will be determined by: (a) examination; (b) consideration of previous courses taken; (c) interview; (d) some other appropriate method; or (e) any combination of the above. The final decision is at the discretion of the department chairman.

Research Requirements. Research competencies are attested by course work in the three core areas, as described above, under program requirements. Additional research competencies may be required by the student's doctoral committee.

Preliminary Examination. In addition to the core and doctoral seminar in education requirements, students must demonstrate competency in their chosen concentrations. Expectations and specific requirements of the preliminary exam are developed by the students and their doctoral committees. Students must file a petition requesting permission to write the preliminary examination with the department chairman at least two weeks prior to the date the examination is to be taken.

Educational Psychology

Students in the concentration of educational psychology will be expected to demonstrate competencies in the following areas:

Competency	Suggested Activity
Statistics/Measurement	Guid. 507/531

Research Methodology	Guid. 567 — when the topic is research design
Learning and Instruction	Selected Courses
Development and Human Dynamics	Selected Courses
Specialization Area	Self-Study/Selected Courses Practicum Experiences/Dissertation (24 hours)

The doctoral committee, in consultation with the student, will determine the means for demonstrating competence and the criteria for successful mastery.

Preliminary Examination. The preliminary examination will be prepared by the doctoral committee of the student. The exam will be composed of questions regarding findings, theory, research methodology; and application in the following areas: learning and instruction, development and human dynamics, comprehensive examination in the student's specialization. The nature of the examination (e.g., timed paper and pencil test, qualifying paper, project, oral examination, experimental or theoretical paper) is to be determined by the student and the committee with the stipulation that some product must be generated, evaluated, and placed in the student's permanent records.

Upon successful completion of the preceding, the student's doctoral committee will make a recommendation regarding admission to candidacy. The recommendation must be filed with the associate dean for graduate studies within two weeks following the written examination.

Guidance and Counseling

Student programs of studies in guidance and counseling are individually designed. Consequently, the requirements include only:

1. Completion of the core requirements (Guidance 506, 511, 531, and 570).
2. The required dissertation credits, of which 24 hours will be the maximum. However, to encourage a broad academic base in the specialty, students typically complete the following courses:
 - a. Those courses required in the guidance and counseling master's program or their equivalent if they have not already been completed;
 - b. Eight to twelve hours of electives outside of the department but related to the specialty;
 - c. At least 6 hours in Guidance 568, topical seminar in guidance and counseling;
 - d. Three hours in Guidance 551, the supervision of practicum.
 - e. Six hours in Guidance 594, internship (advanced practicum) in guidance and counseling.

Preliminary Examination. The guidance and counseling concentration faculty will prepare and evaluate a comprehensive exam not to exceed 8 hours in length. If the student's doctoral committee feels that additional evaluation is necessary at the time of the comprehensive examination, the nature of the additional evaluation will be determined by the student's doctoral committee.

Measurement and Statistics

All programs in measurement and statistics must include: 1. a minimum of 12 hours in Guid. 580; 2. a minimum of 3 hours of electives outside of the department but related to the specialty; 3. a maximum of 24 hours of dissertation credit.

Preliminary Examination. The preliminary examination will consist of three

parts: a core examination in measurement (4 hours), a core examination in statistics (4 hours), and a specialty examination. The first two examinations are prepared and evaluated by the full-time statistics and measurement faculty. The specialty examination is prepared and evaluated by the student's doctoral committee. An oral examination over the preliminary examination is conducted within three weeks of the written examination by the doctoral committee.

DEPARTMENT OF HEALTH EDUCATION

The Department of Health Education participates in the doctoral program in education with a concentration in health education.

Inquiries regarding application should be directed to the chairman of the Department of Health Education.

Admission Requirements

1. Applicants for the Ph.D. with a specialization in school health or safety education should have met requirements for a teaching certificate. Exceptions to this rule may appeal to the academic affairs committee of the department.
2. Applicants for the Ph.D. with a specialization in community health education are expected to have community health work experience. Exceptions to this rule may be appealed to the academic affairs committee of the department.
3. Applicants for the Ph.D. degree must have a minimal over-all grade point average for all preceding graduate work of 3.25 (based on 4.0 as an A).
4. Acceptance into the doctoral program will be based upon undergraduate grade point average, graduate grade point average, past experience, score on Miller Analogies Test and letters of recommendation.

Retention. Students must have a grade point average of 3.50 for all doctoral program work to qualify to take the preliminary examination.

Any prospective doctoral candidate with a grade point average of less than 3.25 after 24 semester hours of doctoral work will not be allowed to continue in the program or be readmitted at a later date.

Program Requirements. Other than general requirements of the Graduate School for all Ph.D. degrees and of the College of Education for all Ph.D. degrees in education, the Department of Health Education requires satisfactory completion of H.Ed. 533A and 533B and Health Education 597A and 697B. Individual programs are developed for each student.

DEPARTMENT OF HIGHER EDUCATION

The Department of Higher Education participates in the doctoral program in education with a concentration in higher education.

The doctoral program offers pre-service and in-service preparation for current and prospective administrators and teachers in two-year colleges and universities and related post-secondary educational institutions.

Currently the graduates of the doctoral program occupy administrative and teaching positions in more than fifty higher education institutions and related agencies.

Application. Inquiries regarding application for admission to the program should be directed to the chairman of the Department of Higher Education. In addition to the application to the Graduate School, the applicant must also submit the depart-

mental application form, an autobiographical statement, at least three letters of reference (special form provided), and test results from either the Miller Analogies Test or the Graduate Record Examination.

Admission and Retention. Each applicant is evaluated on an individual basis with much consideration being given to evidence indicating the applicant's commitment to higher education as a field of study and as a career. Each applicant should plan to visit the campus and interview members of the faculty of the Department of Higher Education. Each application is acted upon by the departmental doctoral admissions committee, the faculty of the department, and the graduate affairs committee of the College of Education.

The records of each doctoral student are reviewed annually by the student's doctoral committee to determine whether the student should continue in the program.

Program Requirements. In addition to the College of Education requirements, the following special minimal departmental requirements should be noted. Additional requirements may be established by the student's doctoral committee.

Core Courses — 16 semester hours

Hi. Ed. 510-3 Higher Education in the United States

Hi. Ed. 518-3 College Teacher and College Teaching

Hi. Ed. 550-2 Higher Education Seminar III

Hi. Ed. 589-2 Higher Education Research Seminar

Two courses (6 semester hours) chosen from the following five courses:

Hi. Ed. 513-3 Organization and Administration of Higher Education

Hi. Ed. 516-3 College Students and College Cultures

Hi. Ed. 525-3 Philosophy of Higher Education

Hi. Ed. 521-3 Curriculum Design and Policy

Hi. Ed. 528-3 Finance in Higher Education

Program Emphasis. Minimum of 16 semester hours. Each student, in collaboration with and concurrence from the doctoral committee, determines the student's program of courses, which may include work from other departments. An internship may be required if the applicant has not had previous professional experience in higher education.

Dissertation. A minimum of 24 semester hours of dissertation credit is required.

Research Requirements. The Ph.D. degree in education is a research oriented degree. The student must demonstrate competency in one or more research areas selected in collaboration with and approval of the doctoral committee. The research competencies should be related to the type of dissertation that is to be submitted and may include such skills as statistics, computer programming, historiography, and an appropriate modern foreign language. The student's doctoral committee in cooperation with other units of the university must certify the student's competency. The dissertation is the scholarly study of an appropriate topic approved by the doctoral committee.

Preliminary Examination. The preliminary examination in higher education is a comprehensive written examination prepared each semester by a special examination committee of the graduate faculty members in the department. The student may also be asked to complete successfully an oral examination. Students may petition their doctoral committee to take the examination when they have successfully completed the research competency requirement, the doctoral seminars, and all or most of the course work listed on the approved program.

DEPARTMENT OF PHYSICAL EDUCATION

The Department of Physical Education participates in the Doctor of Philosophy degree in education with a concentration in physical education.

Inquiries regarding application should be directed to the chairperson of the Department of Physical Education.

Admission and Retention. The applicant must possess a background of knowledge of, and experience with, physical education which will provide a basis for advanced work in this field. The student's experience and interests as well as formal education are considered before deciding the deficiencies and the manner of satisfying them. Credit for work done to satisfy deficiencies will not count toward the Ph.D. degree.

A grade point average of 3.50 is required in courses taken as part of the doctoral program. If at any time the grade point average is less than 3.50, the student will confer with the chairman of the doctoral committee concerning the probability of future success in the program.

A minimum of one year of teaching experience will be required. The adequacy of the experience will be judged by the student's doctoral committee.

Program Requirements. A minimum of 96 credits beyond the bachelor's degree is required as follows:

1. 36 semester hours in physical education courses beyond the bachelor's degree composed of a. 20 credits in physical education for the master's degree major, approved by the student's doctoral committee, and b. 16 credits in approved physical education beyond the master's degree.
2. 36 semester hours in any subject area including course work required of all students by the College of Education.
3. 24 semester hours of dissertation.

Research Requirements. At least one research competency, determined by the student's doctoral committee and approved by the associate dean for graduate studies, is required. Research competencies embody skills needed to understand research in the student's field, to carry out the dissertation, and to contribute to the specialization.

Preliminary Examination. The student must meet the following conditions satisfactorily before applying to the student's doctoral committee to take the preliminary examination: 1. completion of a minimum of 64 hours of course work beyond the bachelor's degree; 2. completion of the courses required of all Ph.D. students by the College of Education; 3. completion of other courses as prescribed by the student's doctoral committee, 4. completion of the research competency.

These examinations will pertain to: the objectives of course work required of all students in the College of Education and to the concentration of physical education.

DEPARTMENT OF SPECIAL 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 chairman of the department.

Admission and Retention. The applicant should possess the following qualifications:

1. A bachelor's and master's degree, one of which is in special education, or a

bachelor's and master's degree, one of which is in general education plus at least five college courses in special education (excluding speech correction or school psychology).

2. A minimum of three years of school or approved related experience with exceptional children, with at least two of these in direct pupil contact.
3. At least one previous degree from an institution other than Southern Illinois University at Carbondale.
4. A minimum grade point average of 3.25 for course work completed while acquiring the master's degree.

The following information must be submitted by the applicant to the graduate faculty:

1. Results of the verbal and quantitative tests of the Graduate Record Examination.
2. Five letters of recommendation from professional associates including one from current or most recent employer, and two from previous graduate level instructors.
3. Evidence of writing ability (e.g., master's paper).
4. A short autobiography.

In addition to the above, a personal interview must be arranged with designated faculty members in the Department of Special Education. Any deviation from these requirements must be approved by the graduate faculty of the department. The graduate faculty of the department will evaluate the data and information. It will then make its decision regarding the admission.

Retention in the doctoral program is contingent upon satisfactory performance of a number of tasks as specified in the general requirements for all students in the Ph.D. degree in Education program. Additional conditions are imposed by the Department of Special Education and are as follows:

1. In addition to maintaining a 3.25 grade point average for the first 24 hours of doctoral course work, the student must maintain a cumulative grade point average of 3.25 for all work completed before the preliminary examination (approximately the first 36 hours of doctoral course work) and will not be admitted to the preliminary examination unless this average has been maintained.
2. All special education doctoral students are required to work in departmental teaching or research activities for a minimum of five clock hours per week during each term of their full time enrollment. A total of one to six semester hours of academic credit is granted for these practicum activities. The purpose of this requirement is to provide an opportunity for the doctoral student to participate in progressively more responsible professional activities under the supervision of the departmental faculty.
3. The graduate faculty of the Department of Special Education meets at least once each term to review the progress of all doctoral students. It is the responsibility of the student's doctoral committee and departmental graduate faculty to determine whether or not the student is making satisfactory progress in the program. If the student is not making satisfactory progress, it is the responsibility of the student's doctoral committee and the departmental graduate faculty to determine whether the student should be dropped from the program or allowed to continue on a conditional basis.

Program Requirements. All students must complete the College of Education doctoral seminar plus the following 8 semester hours of course work: Sp. Ed. 582-2, post-master's seminar: remedial models in special education; Sp. Ed. 583-2, post-master's seminar: program coordination in special education; Sp. Ed. 584-2, doctoral seminar: research in special education; and Sp. Ed. 585-2, doctoral seminar: evaluation in special education programs.

Students also must complete a minimum of 20 semester hours, approved by their committees, from specific courses in the Departments of Educational Leadership; Guidance and Educational Psychology; Curriculum, Instruction, and Media; Psychology; Rehabilitation; Sociology; and Special Education.

Research Requirements. No single research competency is required for every student. The doctoral committee aids the student in selecting a research requirement(s) that facilitates the specific research skills the student needs.

Preliminary Examination. The content of the special education preliminary examination includes (1) historical facts in the development of educational programs for the handicapped, (2) administrative and theoretical issues related to the education of the handicapped, (3) the design and conduct of experiments related to the education of the handicapped, and (4) the planning of educational programs for the handicapped. Examination questions are submitted by the members of the doctoral committee and the departmental graduate faculty. It is the responsibility of the doctoral committee to determine the adequacy of the student's responses to the preliminary examination.

DEPARTMENT OF VOCATIONAL EDUCATION STUDIES

The Department of Vocational Education Studies participates in the doctoral program in education with a concentration in occupational education.

Inquiries regarding application should be directed to the coordinator of graduate studies, Department of Vocational Education Studies.

Admission and Retention. Admission to the concentration is determined by screening committee composed of a minimum of three members of the graduate faculty of the department, and is based on the following criteria: (1) the nature and quality of previous graduate study, (2) the quality of previous written work, (3) the quality and variety of previous employment, (4) letters of recommendation relative to professional and academic competence, (5) the employment potential of the applicant upon completion of the program, and (6) personal interview, if possible.

Program Requirements

Doctoral seminar sequence in education	8 hours
Occupational Education	15 hours
VES 564-3, VES 576-3, VES 594-3, VES 580-3, and VES 584-3	
Supportive studies (student completes one)	9 hours
Management specialization	
Professional development specialization	
Research specialization	
Internship (related to the specialization)	8 hours
Dissertation	24 hours
	—
Total	64

Research Requirement. The student must demonstrate competency in educational statistics or demonstrate competency in computer programming or complete two doctoral courses in statistics, i.e., Guidance 506-4 and 507-4.

Preliminary Examination. The examination will ordinarily consist of two sessions: (1) a written examination of approximately four hours focusing on the departmental core work, prepared and evaluated by the faculty of Occupational Education in the Department of Vocational Education Studies, and (2) a written

examination of approximately four hours duration, which focuses on the student's supportive studies, including the specialty work, prepared and evaluated by the student's doctoral committee. An oral component in the preliminary examination is optional with the doctoral committee.

Those students who fail all or any part of the examination on the initial attempt may repeat that part(s) two additional times. If, at that time, the students have not passed, they will be dismissed from the program.

Educational Administration

(see Educational Leadership for program description)

Educational Leadership

The Department of Educational Leadership offers an approved program in educational administration leading to the Master of Science in Education degree. It also administers the program in educational administration leading to the Specialist degree and provides programs and personnel for doctoral students who wish to specialize in educational administration and cultural foundations. Programs at all levels are NCATE approved. Interested applicants should direct inquiries to the chairman of the department.

Faculty from the Department of Educational Leadership in cooperation with faculty from other departments offer courses in adult and community education. Inquiries about these courses should be directed to the chairman of the Department of Educational Leadership.

Master of Science in Education Degree

At the master's level, concentrations are offered in educational administration, instructional supervision, and adult education.

EDUCATIONAL ADMINISTRATION

Within the administration concentration, specializations may be selected for certificated positions such as elementary principal, secondary principal, curriculum coordinator, school business manager, vocational-technical director, and for a variety of positions in other educational institutions and settings. A minimum of 32 semester hours is required.

Admission criteria include undergraduate grade point average, work experience, letters of reference from persons knowledgeable of the candidate's ability to do graduate level work, and data gained through a personal interview with the candidate.

The program for the Master of Science in Education degree with a concentration in educational administration includes a basic core: administration, EDL 501 and 503; research and tool subjects, EDL 500, GUID 502, and EDL 593; a foundations course (e.g., EDL 430, 432, or 454); and a course in curriculum (e.g., EDL 511, CIM 531, or CIM 571). Elective courses are determined by the student and the adviser, dependent on the student's specialization. A research report and comprehensive oral examination are also required. It is recommended that an applicant seeking administrative certification in the public schools have at least two years of successful teaching experience prior to or concurrent with the program.

INSTRUCTIONAL SUPERVISION

Regulations for the master's degree with a concentration in instructional supervi-

sion parallel those for the concentration in educational administration. Students in this area normally select specialized 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

A basic core representing a minimum of nine semester hours of all course work is required. These courses are: Ed.L. 431, Workshop in Adult and Community Education, Ed.L. 465, Organization and Administration of Adult and Community Education Programs, and Ed.L. 500, Educational Research Methods (or its equivalent). The remaining course work to satisfy the thirty (30) semester hour degree program may be selected from one of the following areas of specialization: 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 program is structured on a 30 semester hour sequence which requires: six semester hours in advanced administration seminars, EDL 551 and 553; four semester hours in an administrative internship, EDL 595; and three semester hours in independent investigation, EDL 596; and additional elective courses, totaling a minimum of 17 semester hours. These elective courses are determined by the student and advisory committee, dependent on the student's specialization. A comprehensive oral examination is also required.

Candidates seeking the Illinois superintendency endorsement (level III) are required to have a minimum of nine semester hours in foundations in their total graduate program and six semester hours in cognate areas such as anthropology, economics, government, sociology, psychology, etc.

Admissions criteria include a minimum graduate grade point average of 3.25 on a master's degree or its equivalent, scores from the Miller Analogies Test, appropriate work experience, letters of reference from persons knowledgeable of the candidate's ability to do advanced graduate level work, and data gained through personal interview with the candidate.

This program is based on the supposition that the applicant has a master's degree or its equivalent in educational administration. Students entering the program without this previous administration training will be required to complete prerequisite work as determined by the student's committee.

Educational Media

(see Curriculum, Instruction, and Media for program description.)

Elementary Education

(see Curriculum, Instruction, and Media for program description.)

Engineering

Graduate programs leading to the Master of Science degree in engineering are available for three concentrations in three engineering departments: electrical

sciences and systems engineering, engineering mechanics and materials, and thermal and environmental engineering. Course offerings and research activities within the departments include:

ELECTRICAL SCIENCES AND SYSTEMS ENGINEERING

Topics include: circuits, electronics, digital systems, energy conversion, bio-engineering, systems analysis, and design, controls, instrumentation, and electromagnetics.

ENGINEERING MECHANICS AND MATERIALS

Topics include: viscous and inviscid flow, compressible flow, wave motion, turbulence, numerical fluid dynamics and solid mechanics, continuum mechanics, materials science, experimental stress analysis, stability, photo-elasticity, structural analysis, and structural design.

THERMAL AND ENVIRONMENTAL ENGINEERING

Topics include: air pollution control, water quality control, thermal pollution, mass and heat transfer, thermal science, thermal systems design, and chemical processes.

A student who is interested in graduate studies in engineering, should seek admission to the Graduate School and acceptance in a degree-program by one of the three engineering departments. The applicant must have 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.

A program of study will be developed by a graduate adviser and the student. Each student is required to concentrate in one of the branches of engineering, but 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, or administrative sciences.

For a student who wishes to complete the requirements for the master's degree with a thesis, a minimum of 30 semester hours of acceptable graduate credit is required. Of this total 18 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 not to do a thesis, a minimum of 36 semester hours of acceptable graduate credit is required. In this non-thesis option, students are expected to take at least 21 semester hours of acceptable graduate courses within the major department, including 3 semester hours of the appropriate 592 course which could be devoted to the preparation of a research paper. In addition, each candidate is required to successfully complete (a) a research paper, and (b) a written comprehensive examination.

Each student in this non-thesis option will select three engineering graduate faculty members to serve as an examining committee, subject to approval of the chairman of the department administering the concentration. This committee will consist of two members from the department in which the student is concentrating plus one member from one of the other two 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
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 School of Engineering and Technology or any one of the three engineering departments.

Engineering Biophysics

Interdisciplinary graduate work leading to a Master of Science degree in engineering biophysics builds upon an interdisciplinary undergraduate program at SIU, which has its core in the areas of chemistry, engineering, mathematics, physics, physiology, psychology, and speech pathology and audiology. The graduate program provides the student with the unique opportunity to work with the faculty and facilities in increasingly integrated areas throughout the University and to specialize in solving problems of biomedical physics that involve several academic and professional disciplines.

The engineering biophysics committee, appointed by the dean of the Graduate School, is the agency that evaluates the program and recommends policy for its development. The committee appoints an administrator who is responsible to it and to the student for the daily as well as long-run activities of the program. The committee has a chairman and it sees that the program is administered in accordance with the policies established by that committee and with the policies of the graduate council and the dean of the Graduate School.

Admission to the Program

1. A student must apply and be admitted to the Graduate School, even if continuing from the four-year program at SIU.
2. A bachelor's degree from any of the behavioral, life or physical sciences, engineering, or mathematics serves as a minimum requirement for admission. A very favorable route is by following the prescribed interdisciplinary curriculum of the four-year undergraduate program in engineering biophysics at SIU at Carbondale, or its equivalent elsewhere.

Tool

No demonstration of language competency is required for the master's degree. The student is urged, however, to acquire a reading knowledge of French, German, or Russian in his undergraduate experience.

Core Requirements and Internship

The year of work at the graduate level emphasizes courses in physiology, psychology, and speech pathology and audiology. These core-area requirements amount to 19 semester hours and include courses in medical instrumentation, neurophysiology and pathology, sensory processes, systems and simulation, human engineering, statistics, and seminar. The courses provide a basis for internships in hospitals and in laboratories in industry and government. The internship is a requirement of the graduate program for which six semester hours of credit are allowed. The internship might well be accomplished in the summer session of the graduate year. Three elective courses at the graduate level make up additional requirements for completing the degree.

English

The Department of English offers programs leading to the Master of Arts and the Doctor of Philosophy degrees 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 a graduate program in English must meet requirements for admission to the Graduate School and must be approved for admission by the Department of English.

In addition, students seeking admission to the Doctor of Philosophy program must present a score of the 70th percentile or above in the advanced section of the Graduate Record Examination.

Information about admission to graduate programs in English may be obtained by calling (618-453-5321) or writing the director of graduate studies, Department of English, Southern Illinois University, 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 course was taken and the grade. As nearly as possible the course to be transferred should be equated with a course offered by the SIU 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 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. In effect, 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 exams, papers, etc., to the instructor. Deferred or incomplete grades in English 595 or 600 are not included in the above regulation.

Coursework

A student 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 his program.

Master of Arts Degree

The Master of Arts degree program in English requires satisfactory completion of 30 semester hours of which 15 must be earned in 500-level courses.

The program, broad rather than concentrated, requires students to:

1. Complete as a graduate student a 3-hour course in each of the following periods of English literature: before 1500, 1500-1660, 1660-1800, 1800-1885; one 3-hour course in American literature before 1900 and one 3-hour course in either modern American or modern British literature.
2. Pass a comprehensive examination over a reading list that touches all literary periods.
3. Complete one course in the English language or one in English linguistics.
4. Satisfy a foreign-language requirement by either (a) passing a reading examination set by the Department of English or (b) presenting two years or the equivalent of college-level study in a foreign language with an average of *B'* or better for the work.
5. Submit to the Graduate School through the Department of English a copy of one of their research papers graded *B* or *A*.
6. Complete (but only if a graduate assistant) English 585 or 581, as designated by the department.

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.

A full-time student holding a master's degree can complete the doctoral program in two years, though most prefer three.

After a period of study in the doctoral program the student may take preliminary examinations over the selection of areas in English and American literature that have been approved by the student's advisory committee. If the person passes the examinations, the department will recommend the student to the Graduate School for admission to candidacy. The candidate is then expected to write an acceptable dissertation and to defend it in an oral examination touching his thesis and major field of study.

The program stipulates no number of classroom hours; students take the courses they need and present themselves for examination when ready. If they do not hold a Master of Arts degree in English from Southern Illinois University, they may be asked to complete any important omissions from its prescriptions.

As graduate or undergraduate, a student will be expected to have completed courses in Chaucer, Shakespeare, and Milton. As a graduate, the student must have earned *B* or better in one course in the English language and one course in English linguistics except where this requirement asks for repetition of identical work.

Tool Requirements. By one of the following three options a student must show command of certain means of research:

1. Pass (or have passed for the M.A.) reading examinations in two languages other than English. Under prescribed conditions a foreign student may present his native language, but will be required to demonstrate oral and written fluency in English. The director of graduate studies in English must approve all languages proposed.
2. Pass a reading examination and present two upper-level or graduate courses with grade of *B* or better in one foreign language or its literature.
3. Pass a reading examination in one foreign language and present two courses numbered 400 or above with an average grade not lower than 3.0 in a discipline related to the student's own research in English. The related discipline should provide a special research technique or collateral field of knowledge.

Preliminary Examinations. Students on a fellowship or a graduate assistantship

will be expected to take preliminary examinations no later than two and three years, respectively, after receipt of their M.A.

Preliminary examinations 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, and the minor-areas of two three-hour written exams. Preliminary examinations will be given only twice in a single term.

At the discretion of the committee, a two-hour oral examination will 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 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

Students who have been admitted to graduate study will plan their courses 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 decision should be made before the end of the second semester of study. Students deciding to submit the research paper must take the appropriate course (FL 566, 567, 568, or 569) in bibliography and research techniques.

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.

Master of Science in Education

The Master of Science in Education degree in secondary education with a teaching specialty 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 in higher education with a teaching specialty in one of these foreign languages 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 specialty is Russian, Russian 515 is required.

FRENCH

The program of study leading to the Master of Arts degree in French is planned to afford a comprehensive overview of French literature and the structure of the French language. The student is expected to pursue a course of study which will provide some knowledge of all the historically important movements and figures in the literature as well as a special competence in an area of concentration selected by the student in consultation with the appropriate graduate adviser.

Each student's program must include French 412, history of the French language. The student must demonstrate proficiency in a second foreign language by passing an examination in that language or by successfully completing approved course work in the language.

GERMAN

A student seeking a Master of Arts degree in German may concentrate in either German language and linguistics or in German literature; a minor must be completed in the other of these two fields. Courses required of all students in German:

1. FL 567, bibliography and research techniques in German (must be taken the first time it is offered after a student's first semester of graduate study)
2. German 413, history of the German language
3. One course in an older period of a Germanic language: German 510, middle high German, is recommended, but alternative courses could be: German 512, English 501-502, English 503. In addition, German 412, contrastive analysis: English and German, is strongly recommended for prospective teachers of German.

Each student will be required to demonstrate, by examination, an acceptable reading knowledge of a second foreign language approved by the German section.

SPANISH

A student seeking a Master of Arts degree in Spanish should consult with the graduate adviser in planning a suitable graduate program. The minimum requirements are:

- a. Required courses
Spanish 412-3, FL 569-3
- b. Thesis or research paper: (Option 1 or 2 required)
Option 1. If writing a thesis: 6 hours of Spanish 599 or 3 hours of Spanish 599 plus 3 hours of an elective Spanish graduate course.
Option 2. If writing a research paper, either a or b required.
 - a. 4 hours of elective Spanish graduate course work, plus 2 hours of FL 509.
 - b. 6 hours of elective Spanish graduate course work.
- c. Additional graduate course work in Spanish

Before taking the comprehensive written examination, all students must demonstrate reading proficiency in another foreign language by obtaining: (a) a grade of at least *B* in 288B or in a fourth-semester college-level course in the chosen

language, or (b) a score of 465 on the Educational Testing Service Ph.D. reading examination, if the language is French, German, or Russian, or (c) a grade of at least *B* on a departmental examination if the language — Portuguese, for example — is one not tested by ETS.

Forestry

The Department of Forestry offers advanced courses for the Master of Science degree in forestry. In addition, curricula are available which permit graduate students with an interest in forestry to pursue this 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, employer's 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 should fill out the statement of interest form. This form indicates the student's area of interest in forestry and the faculty member under whom the student desires to study. All correspondence should be directed to the chairman of the Department of Forestry.

Retention and Completion Requirements

Upon the graduate student's arrival on campus, an advisory committee of 3-5 members of the graduate faculty will be formed to guide the student's work. The same committee will be responsible for preparation and administration of thesis exams and also for the reading of the thesis. The advisory committee chairman and 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 chairman 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 four 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 chairman, 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 copy of the thesis will be provided for the department, one for the chairman of the advisory committee in addition to 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 four areas of concentration with specialties within each. Combination of specializations is possible.

FOREST RESOURCE MANAGEMENT

Under this heading, a given graduate program may concentrate on forest management, forest ecology, forest resources measurements, forest resources economics, forest genetics, or forest policy and administration.

OUTDOOR RECREATION RESOURCE MANAGEMENT

Specialization 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. Ten to twelve research assistantships are sponsored each year by the McIntire-Stennis Cooperative Forest Research Act. Eight 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.

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

- a. Southern Illinois University is well endowed with a number of different forest types which are available to the forestry department for teaching research purposes. In particular, we are conducting or planning research and demonstration programs on forest plots and experimental fields of the 3000 acres of Southern Illinois University at Carbondale 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.
- b. 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. A research green house 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.
- b. 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 SIU School of Technical Careers approximately twelve miles east of the main campus.

Geography

Programs offered through the Department of Geography lead to the Master of Arts, the Master of Science and the Doctor of Philosophy degrees in geography. Concentrations are available in physical environmental systems, resource management systems, and (at the master's level) urban and regional planning. Students may also complete requirements for the Master of Science in Education degree in secondary education with a teaching specialty in geography.

General Requirements

The graduate program for each student will be structured from a student inquiry viewpoint. The student should take the initiative with the guidance of the adviser and the departmental faculty during all phases of the program.

Each student's progress will be assessed each semester by the faculty in a meeting within 10 days after the beginning of the ensuing semester. Following that meeting, a statement based on faculty reports of performance will be written

by the adviser for submission to the student, the chairman of the department and the graduate research, program, and professional activities committee. Each student is expected to show continued progress and, in particular to develop habits of critical analysis and dialogue.

Master's Degree

Selection of a Tentative Adviser. Students admitted to the master's program should expect to qualify for the master's degree within a 15-24 month period depending on academic and work loads. Incoming students should choose a tentative adviser no later than two weeks after the beginning of their first semester of residence. The choice will be made in consultation with the chairman of the department and with the consent of the prospective tentative adviser, taking into consideration such matters as faculty expertise and faculty advisee loads.

Course of Study. A proposed course of study, identifying deficiencies to be rectified, and language, statistics (viz.: Geog. 410, 510), or other technique requirements, will be initiated by the student in consultation with his adviser during the student's first term of residence. The proposal will be presented to the department committee responsible for the graduate program for comment and approval. The course of study shall include Geog. 500-3, principles of research, and at least two courses from the following, depending on the student's background:

Geog. 422-4, Economics in Geography and Planning I

Geog. 424-4, Natural Resources Planning

Geog. 425-4, Water Resources Planning Simulation

Geog. 432-4, Urban Climatology of the Environment

Geog. 432b-4, Hydrologic Climatology

Geog. 470-3, Urban Planning

Geog. 471-3, Regional Planning

Geog. 522-4, Economics in Geography and Planning II

Each student also include at least two geography seminars in his program.

Degree Requirements. In addition to the master's degree requirements of the Graduate School, the student shall:

1. Arrange for an adviser and master's advisory committee in consultation with his tentative advisor before the end of the first year of graduate studies.
2. Develop a thesis or research paper proposal. The thesis or research paper proposal must be approved by the student's master's advisory committee before the student registers for Geog. 599 (Thesis) or Geog. 593 (Research in Geography). A total of 4-6 credit hours of Geog. 599 may be awarded for a thesis at the discretion of the advisory committee upon final examination on the thesis (see #4 below). A total of 2-3 credit hours may be awarded for a research paper.
3. The student will submit a thesis or research paper to the advisory committee at least two weeks before his comprehensive examination.
4. The student will complete a comprehensive examination at which the student's master's studies and thesis or research paper will be reviewed and evaluated. This shall be at least six weeks prior to the student's projected graduation date.
5. Upon approval of the comprehensive examination and the thesis or research paper, the advisory committee will request the chairman of geography to forward to the Graduate School the recommendations of the geography faculty that the master's degree be awarded.

Master of Science in Education degree. This degree is available from the College of Education from applicants who consider teaching of geography as a career. For further details see the program statement for Secondary Education.

Doctor of Philosophy Degree

The Ph.D. degree in geography is a specialized research degree which may be earned in either of two concentrations: physical environmental systems or resource management systems. The Ph.D. program assumes a broad background comparable to that provided by the M.A. or M.S. programs, and is designed to develop a comprehensive yet critically analytic knowledge of theory, literature, research design, and application within one of the two concentrations. In addition, the Ph.D. student will concentrate in two subfields in which to propose creative research.

The Program. The student and the tentative adviser will formulate a program which will demonstrate competence or include a set of core courses comparable to the master's program. The student may elect to demonstrate competence in the course work as outlined in the geography master's program.

Each student will include three research seminars in the program. Before the end of the first term of doctoral work, the student will select an adviser and they jointly will recommend doctoral committee members to the graduate faculty for certification.

The student and the doctoral committee will ascertain appropriate tools and cognate courses; proficiency in these will be certified by the doctoral committee.

Comprehensive (Preliminary) Examination. Upon completion of the program, and with the approval of a majority of the graduate faculty, the Ph.D. student will offer for a comprehensive written and oral examination two subfields from within either physical environmental systems or resource management systems.

The written portion of the comprehensive examination will be prepared by the student's doctor 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 graduate faculty will be invited to the oral examination which 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.

Having passed the comprehensive examination, the doctoral student will present a dissertation proposal at an open meeting of the geography department. The written and oral examination and presentation of the dissertation proposal are prerequisite to admission to candidacy.

Dissertation. The student's written dissertation will be circulated to members of the doctoral committee at least two weeks in advance of the proposed defense. The doctoral committee will announce a public invitation a week in advance and will hear the student's defense at the place and time approved by the Graduate School. The finished dissertation will be sent to the student's doctoral committee for approval. The judgment of the official committee will be expressed to the student and forwarded to the chairman of the department for recommendation to the Graduate School for conferring of the Ph.D. degree.

Geology

The Department of Geology offers a program leading to the Master of Science degree in geology.

Master of Science Degree

The objective of the master's program is 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, palynology, paleoecology, coal petrology, coal geology, stratigraphy, sedimentation, sedimentary environments, crystallography, mineralogy, low temperature geochemistry, ore deposits, petroleum geology, environmental geology, geomorphology, hydrogeology, and exploration 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. Preparation for teaching earth science at the high school and junior college level may also be undertaken in cooperation with the College of Education and other science departments.

A student must be admitted unconditionally to the Graduate School before the student can be officially admitted to the master's program in geology. The student will be expected to have satisfactorily completed at the undergraduate level in the equivalent of course work in the basic sciences required for a bachelor's degree in geology at Southern Illinois University at Carbondale.

A student admitted with course deficiencies may be required to complete or audit some undergraduate courses. Specific requirements will be determined by the student's advisory committee and the department chairman. Each student is evaluated on an individual basis, and the student's program is determined by individual career goals and the results of informal preassessment interviews with faculty members.

Requirements

A total of 30 hours of graduate work completed with an average grade of *B* or better constitute minimum credit requirements for the master's degree.

No specific graduate courses are required. Courses taken are determined by the student and his advisory committee. The student will not be permitted to enroll in more than 6 hours of independent study or research courses (exclusive of thesis credits).

A student majoring in geology may select a minor field. Minimum coursework 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 should have been covered by courses.

In order to pass the final oral examination a student must receive a favorable majority vote from the thesis committee, meeting in formal session. Should the student fail the final oral examination, the student may, upon concurrence of a majority of the committee, arrange a time for a reexamination not less than 30 or more than 120 days after the first examination. If the student fails the final orals on the second attempt, ineligibility for the master's degree from the Department of Geology will be established.

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.

Assistantships

Teaching assistantships are awarded and supervised by the Department of Geol-

ogy. 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 advance approval of the assistantship committee 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. Requests for relaxation of this policy must be made in writing to the department chairman.

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 industry actively support geological work in this area.

Guidance and Educational Psychology

The Department of Guidance and Educational Psychology offers graduate programs leading to the Master of Science in Education degree in guidance and educational psychology with concentrations in (1) guidance and counseling and (2) educational psychology and the Specialist degree in guidance and counseling.

In addition the department actively participates in the Ph.D. degree in education program.

The Department of Guidance and Educational Psychology in cooperation with other academic units offers graduate work in adult education. Inquiries about such work should be directed to the chairman of the department.

Master of Science in Education

Admission is based upon an analysis of the academic and personal potential of the individual. Prerequisites include:

1. Admission to the Graduate School.
2. Completion of departmental application form.
3. Applicants must be eligible to hold a teaching certificate if interested in elementary or secondary school employment. Special cases examined by the selection and review committee may arise. In such instances each situation will be reviewed carefully on appeal from the individual concerned.
4. Applicants for the master's degree who have earned a 2.70 grade point average (based on 4.0 as A) in the undergraduate degree will be admitted to graduate study. Those students whose averages are below 2.70 but above 2.40 may, with good reason, petition that the selection committee of the guidance and educational psychology department accept them conditionally in accordance with the regulations of the Graduate School.
5. Submission of four reference letters or letters of recommendation from professors, academic advisers, former employers, fellow teachers, or others familiar with the applicant's academic performance, research, teaching or other relevant work. The referent should be asked to comment upon the applicant's personal qualities—ideals, honesty, and leadership—ability to work in one's chosen career field (relationship with peers and organization ability), academic achievement, work experience, sense of job responsibility. Reference letters should be mailed direct to the Department of Guidance and Educational Psychology. (Students electing the educational psychology concentration may submit three letters.)

GUIDANCE AND COUNSELING

A student admitted to the concentration of guidance and counseling may select

programs in preparation for work in the elementary or secondary school setting or for positions in higher educational settings, career development centers, and child guidance centers. The degree emphasis is in child or adolescent, and adult counseling. The student is expected to develop competence in counseling. It is the intent of this program to prepare counselors in the following areas: (1) The counselor as a person, (2) counseling services, (3) career development, (4) human/environment assessment, (5) consultation, (6) coordination, (7) research and evaluation, (8) referral, and (9) change agency. The student is expected to develop a philosophy of education and the role of counseling and guidance services within this philosophy.

Admission Requirements. Students electing a concentration in guidance and counseling must meet general departmental admission requirements and:

1. Must have one year of full time employment subsequent to receipt of their bachelor's degree or be 24 years of age at the time of application to the program. Special cases examined by the selection and review committee may arise. In such instances each situation will be reviewed carefully on appeal from the individual concerned.
2. Receipt from an appropriate university or other agency of scores received on the Miller Analogies Test. This test can be taken on campus at the student's convenience.
3. Complete an autobiographical sketch. The Department of Guidance and Educational Psychology selection and review committee is interested in each applicant as an individual. The autobiographical sketch should comment upon the following:
 - a. Early life experience which may have influenced your development, *e.g.*, significant incidents in your home with parents, siblings, friends; work and responsibilities as an employee or member of a group; experience in school and elsewhere.
 - b. College experience including a listing of organizational memberships, offices held, and other activity participation which influenced a decision to apply for the chosen program of study in the Department of Guidance and Educational Psychology.
 - c. Work and other experiences, *e.g.*, teaching, summer camping, church work, work in industry, which support your chosen program of study in the Department of Guidance and Educational Psychology.
 - d. Interpersonal relationships with your peers and other educators which influenced your decision to enter education which may affect your success as a professional educator.
 - e. The role you perceive to be that of the educator-counselor as one relates to the students, the faculty, and the administrative staff.
 - f. The social issues which you believe to be most important to mankind.
 - g. Summarize, briefly, why you feel that you will succeed in your chosen field of work.

Academic Requirements

1. Minimum of 36 hours of course work with a minimum grade point average of 3.0.
2. All candidates will be required to pass one written examination during the semester in which he completes requirements for the master's degree. A written request from students signed by the advisers, must be submitted one month prior to the examination date. Should the candidate fail to pass comprehensive exams, they can expect to complete additional work as determined by the examining committee.
3. A thesis or equivalency paper in lieu of thesis is required.
4. As part of their practicum experience full time graduate students will be

placed in an appropriate educational setting for a minimum of one and a half days a week. This experience will occur during the second and third semester. Laboratory experiences and a seminar appropriate to the field work will be included. Special arrangements will be made for part time students.

Curriculum. Adolescent and adult counseling: students interested in counseling adolescents and adults are required to complete the following courses within the department: 562b Human Development in Education (3 hrs.); 538 Interpersonal Relations: Theory and Practice (4 hrs.); 542 Career Development Procedures and Practice (4 hrs.); 530 Standardized Testing: Use and Interpretation (4 hrs.); 543 Group Theory and Practice (3 hrs.); 547 Implementing Guidance Services, required only for public school counselors, (3 hrs.); 502 Basic Statistics (3 hrs.); 494b Adolescent and Adult Counseling Practicum (3 hrs.); 494c Career Planning Practicum (3 hrs.). Elective courses will be determined jointly by the student and the academic adviser.

Child counseling: students interested in counseling with children are required to complete the following courses: 562a Human Development in Education (3 hrs.); 521 Analysis of Classroom Behavior — Consultative Practices for School Personnel (3 hrs.); 537 Counseling with Children: Theory Techniques, and Practice (4 hrs.); 530 Standardized Testing: Use and Interpretation (4 hrs.); 543 Group Theory and Practice (3 hrs.); 547 Implementing Guidance Services, required only for public school counselors (3 hrs.); 494a Child Counseling Practicum (3 hrs.). Elective courses will be determined jointly by the student and the academic adviser.

EDUCATIONAL PSYCHOLOGY

The student enrolled in the concentration of educational psychology may select specializations in (1) human learning and development and (2) applied instructional psychology. The respective objectives and curricula for each specialization are described below. Requirements for admission, retention, and graduation, (which are mostly common for both program emphases) follows.

Admission Requirements. Students electing a concentration in educational psychology must meet general departmental requirements and should submit examples of previous work, related to education or psychology, i.e., papers, articles, curriculum materials, etc. as direct evidence of student's potential in this concentration. This is highly desirable, but not required.

Academic Requirements. Academic requirements common to both specializations include:

1. A B average in a sequence of prescribed courses totaling 32 semester hours.
2. A thesis must be written for the educational research specialization. The thesis topic is to be formally approved and the thesis is to be read and accepted by the student's adviser and one other member of the departmental faculty. Students in the applied instructional psychology specialization will submit a paper or product based on their internship work in lieu of thesis. As with the thesis, the paper or product will be judged by at least two department graduate faculty.

EDUCATIONAL PSYCHOLOGY (HUMAN LEARNING AND DEVELOPMENT)

Program Objectives. The masters program with a specialization in human learning and development is designed to provide students with fundamental knowledge and inquiry skills in the areas of human learning, development, socialization, instruction, research design and quantification procedures. The program is primarily designed for individuals preparing for doctoral work in educational psychology. Some occupations open to students completing this degree include:

research work in public schools, universities, research and development centers, as well as industrial, military, or rehabilitation settings. Graduates might also be employed as teachers in universities and junior colleges.

Curriculum. Students will study in three areas which are designed to provide the necessary foundation in the major areas of educational psychology. The program will be determined jointly by the student and the academic adviser in accordance with the following departmental requirements.

1. Learning: 6 hours.
2. Design and Quantification: 10 hours.
3. Social-Developmental: 6 hours.
4. Thesis: 6 hours.
5. Elective: 4 hours.

A total of 32 semester hours is required.

EDUCATIONAL PSYCHOLOGY (APPLIED INSTRUCTIONAL PSYCHOLOGY)

The master's degree with a specialization in applied instructional psychology is designed to make a teacher more effective in the classroom. Emphasis will be on interpersonal relations and group dynamics in the classroom, cognitive and affective growth, classroom discipline, and psychological trends, problems, and issues in contemporary education. Design and development of classroom tests will be covered as well as the use and interpretation of standardized tests.

There are two options for completing the program. First, there is an option for part-time students, such as teachers. This option is designed to take two summers and two academic years to complete. But the reader should note that only one course is taken during each semester of the academic years. More than one course can be taken by consent of the department and thereby reduce the completion time. Courses will be offered in the late afternoons or evenings so that teachers who are employed can attend them. The second option is for full-time students. This option can be completed in two summers and one academic year.

An internship is part of this master's degree program. The internship requirement can only be satisfied by professional work in an elementary, secondary, or post-secondary school.

The degree requires 30 hours of work which includes two electives and one paper (one hour credit) which is to focus on the internship experience (Guidance 595) and which is in lieu of a thesis. One elective should be in a content area of the student's choice; such as reading, math, science, social studies, etc. The other elective should be from special education and should involve training of handicapped children; that is, mentally retarded or defective, hard of hearing or deaf, poor eyesight or blind, stutters, epileptics, etc.

The part-time and full-time options are illustrated below. They should not be interpreted as fixed sequences of courses or completion times. There is considerable flexibility and other schedules and sequences can be arranged with departmental consent.

Option 1 (part-time students)

First summer: two electives
 First fall: 512
 First spring: 518
 Second summer: 422, 540
 Second fall: 513, 595 (4 hrs)
 Second Spring: 595 (4 hrs), paper

Option 2 (full-time students)

First summer: two electives
 First fall: 512, 513, 422
 First spring: 518, 540, 595 (4 hrs)
 Second summer: 595 (4 hrs), paper

The Specialist Degree

The Specialist degree in guidance and educational psychology is awarded to students who complete successfully the equivalent of a year of sequenced training

(minimum 30 hours) beyond the master's degree. Students who complete the program of study may qualify for positions as pupil personnel administrators or counselors with special populations or for admission to an internship in school psychology.

The specialist program is designed to train service oriented personnel who have interests in children and young adults who have learning and social problems related to their schooling. Sensitivity to the school or college as a social system and understanding the interrelationships among professional personnel as well as between staff members and students are emphasized.

Program Objectives. This specialist program is designed to meet the needs of school personnel through an interaction model of training involving local school districts, the state Department of Public Instruction, the College of Education, and other appropriate resources. All students who complete the specialist program will be expected to have skills and knowledge in the area of: (1) consultive roles of school specialists, (2) counseling theory and practice, (3) individual appraisal and diagnosis, (4) evaluation of school programs, and (5) management of classroom behavior.

Students in conjunction with their advisers will select one or more of these areas for special emphasis. Laboratory practice and experiences in the schools will be employed to relate knowledge gained through formal course work to the skills required on the job.

Program Administration. Faculty members of the Department of Guidance and Educational Psychology who have responsibilities in the specialist program hold doctorates and are experienced practitioners. The content and quality of the specialist program, including curriculum review, selection of students, and program relevancy, are the responsibility of an admissions committee.

Admission procedures: admission into the program of study is established by the approval of an admissions committee.

1. The student must be admitted to the Graduate School and
2. Must complete the application for admission requirements (letters of recommendation, test scores, as identified on the admission application).

Admission criteria required by the department:

1. A master's degree or its equivalent in educational psychology, special education, guidance, or related area is required.
2. Submission by an appropriate university or other agency of scores received on the Graduate Record Examination. The tests may be taken on campus at Southern Illinois University at Carbondale.
3. Experience in the public schools or related areas is required.
4. A 3.25 graduate grade average (based on 4.0 as A) will be required of applicants for the Specialist degree before they will be admitted to the program unconditionally.
5. A student must be admitted by both the Graduate School and the department admissions committee.
6. Students must have academic competencies in the following areas for unconditional admittance to the Specialist degree program:

Competency Areas:

- | | |
|-----------------|--|
| (a) Statistics | Guid 502 (Introduction to Statistical Methods) or Equivalent |
| (b) Measurement | Guid 530 (Standardized Testing) or Psych 522 (Experimental Design and Analysis) or equivalent |
| (c) Personality | Psych 440 (Personality Theory) or Psych 530 (System of Personality and Psychotherapy) or Psych 431 (Psychopathology) or equivalent |

- (d) Behavior & Development Guid 562a (Human Development in Education or Guid 562b (Human Development in Education or Psych 451 (Advanced Child Psychology) or Psych 554 (Development Theory) or equivalent
- (e) Curriculum El Ed 561 (Elementary School Curriculum) or Sec. Ed. 562 (Secondary School Curriculum) or Ed AF 511 (Curriculum Organization) or equivalent

A department admissions committee will inform appropriate university offices when the applicant is accepted to a program of study.

Certificate Requirements

1. The requirements for the Specialist's degree are reviewed in Chapter 1 of this catalog. A minimum of 30 semester hours beyond the master's degree with a 3.25 grade point average is required for all course work taken at the specialist's level.
2. A candidate is required to pass a written comprehensive and an oral examination over course work after 24 semester hours have been completed. An evaluation is also made of the candidate's performance as a professional in a public school.
3. A scholarly paper or project is required on a topic formally approved by the student's specialist committee.

The students will follow the guidelines suggested below so that minimal competencies for the Specialist degree will be assured.

		HOURS
Analysis of Classroom Behavior	Guid 521	3
Seminars: Counseling	Guid 568	3
Evaluation (as the topic)	Guid 580	
School Psychology	Guid 555	
Practicums: School Psychology	Guid 494d	3
Counseling	Guid 494a	
Advanced Practicum	Guid 594	
Individual Investigation	Guid 592	3
Individual Appraisal	Guid 532	10
	Guid 533	
	Guid 546	
Electives		8

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, and participates in the Ph.D. degree in education. Students interested in seeking employment in the area of industrial safety are encouraged to consult with the chairman regarding appropriate courses.

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 chairman.

3. Miller Analogies Test scores must be submitted. Students may take this test on the SIU campus at Carbondale.
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 in accordance with regulations of the Graduate School.

Additional admission requirements for the concentration in school health education or safety education:

1. Candidates should be certified for teaching. Exceptions to this requirement may appeal to the academic affairs committee of the department.

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.

Higher Education

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

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

The Department of Higher Education offers four concentrations toward the Master of Science in Education degree in higher education: academic administration, college and university business affairs, college student personnel, and community and junior college teaching. Students interested in one of these master's programs may obtain information and advisement from the advisers of the respective programs through the Department of Higher Education.

The Department of Higher Education in cooperation with other academic units also offers graduate work leading to the Master of Science in Education degree with a concentration in adult education. Inquiries about this concentration should be directed to the chairman of the department.

Application. Inquiries regarding application should be directed to the chairman of the Department of Higher Education. Each applicant must submit an application to the Graduate School. In addition, an applicant is required to submit to the Department of Higher Education the departmental application form, an autobiographical statement, three letters of reference (special form provided), and, when necessary, 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 college and university business affairs master's program may be required to have taken certain courses in or to have attained at least one or more competencies related to business affairs. Students considering college student personnel programs 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 or junior 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 progress, in supervising the thesis or research paper, and in administering the final examination. The records of each master's 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

32 semester hours (minimum)

Required Courses: 15 semester hours

Hi Ed 510-3 Higher Education in the United States

Hi Ed 513-3 Organization and Administration in Higher Education

Hi Ed 516-3 College Students and College Cultures

Hi Ed 518-3 College Teacher and College Teaching

Hi Ed 535f-1 Academic and Faculty Administration

Hi Ed 545e-2 Problems in Central Administration

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

COLLEGE AND UNIVERSITY BUSINESS AFFAIRS

32 semester hours (minimum)

Required Courses: 14 semester hours

Hi Ed 501-2 Research in Higher Education

Hi Ed 513-3 Organization and Administration in Higher Education

Hi Ed 518-3 College Teacher and College Teaching

Hi Ed 528-3 Finance in Higher Education
 Hi Ed 535f-1 Academic and Faculty Administration
 Hi Ed 545e-2 Problems in Central Administration
 Hi Ed 545f-2 Business and Fiscal Affairs

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

One or more professional competencies relative to business affairs are required.

COLLEGE STUDENT PERSONNEL

40 semester hours (minimum)

Required Courses: 14 semester hours, including 2 hours of credit internship

Hi Ed 515-3 College Student Development: Operations and Policies
 Hi Ed 516-3 College Student and College Cultures
 Hi Ed 525-3 Philosophy of Higher Education
 Hi Ed 595-2 Internship in Higher Education
 Guidance 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 OR JUNIOR COLLEGE TEACHING

32 semester hours (minimum)

Required Courses

Courses in the teaching specialty: 20 semester hours

Courses in Higher Education: 12 semester hours

Hi Ed 516-3 College Students and College Cultures

Hi Ed 518-3 College Teacher and College Teaching

Hi Ed 521-3 Curriculum Design and Policy

Hi Ed 526-3 Community Junior 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)

Hi Ed 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 college and university business 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 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 course work, the student is recommended to the Graduate School for graduation.

Financial Aid

The Department of 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.

History

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. For the Master of Arts degree in history, the department has no formal admission requirements beyond those of the Graduate School, except that students admitted with a GPA 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. For admission to the doctoral program, each applicant should submit to the department, in addition to the material sent to the Graduate School, the following: three letters from former teachers, preferably at the graduate level; a letter expressing the applicant's professional and personal objectives; and a report of the result of the aptitude test (verbal and quantitative) and the advanced test in history of the Graduate Record Examination.

The Master's Degree

Three concentrations are offered for the Master of Arts degree in history: American, Latin American, and European. 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 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 administrating department in the College of Education before registering for courses.

For the Master of Arts degree 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 six hours of graded 500-level courses. A candidate for the Master of Arts degree must demonstrate proficiency in one foreign language, statistics, or computer programming.

The language requirement may be fulfilled either by passing Foreign Language 288b with a grade of *A* or *B* or by passing a reading examination offered by the Educational Testing Service. Proficiency in statistics may be demonstrated by passing Guidance 506 or Mathematics 514 and 515 with a grade of *A* or *B*. Competency in computer science may be demonstrated by earning an *A* or *B* in Computer Science 202 and a second course in computer science approved by the Chairman of the Department of Computer Science. The candidate may fulfill the research requirement through either the thesis or the non-thesis program.

A candidate in the thesis program should, with the approval of the chairman, 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. The candidate must submit an acceptable thesis and pass a comprehensive oral examination covering his fields of specialization and his thesis.

A candidate in the non-thesis program must receive an *A* or *B* in two separate 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 three-man committee. The examination will cover two fields of the candidate's choice.

DIVISION I — AMERICAN HISTORY

United States to 1877
United States 1865 to present

DIVISION II — LATIN AMERICAN HISTORY

Colonial
19th Century
20th Century

DIVISION III — EUROPEAN HISTORY

Ancient
Mediaeval
England since 1600
Europe, 1450-1789
Europe, 1789 to present

DIVISION IV — ASIAN HISTORY

The Doctor of Philosophy Degree

Students seeking the Ph.D. degree in historical studies must complete at least two years of full-time graduate work beyond the bachelor's degree or one year beyond the master's degree (or its equivalent), and submit a satisfactory dissertation. 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. The goal is to develop high competence in the five selected fields in which the student will be examined. 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, statistics or computer programming may be substituted for one language. Procedures for demonstrating proficiency in foreign language, statistics, or computer programming are the same as those required for the Master of Arts degree. The language requirement must be satisfied prior to the preliminary examinations.

The department offers advanced study in thirteen fields of history which are grouped in four major divisions.

DIVISION I — AMERICAN HISTORY

Colonial
United States, 1776-1865
United States, 1865-1919
United States, 1919 to present
Mississippi Valley and Illinois

DIVISION II — LATIN AMERICAN HISTORY

Colonial
19th Century
20th Century

DIVISION III — EUROPEAN HISTORY

Mediaeval
England since 1600
Europe, 1450-1815
Europe, 1789 to present

DIVISION IV — ASIAN HISTORY

Each student will be responsible for five fields; either all five in history or four in history and one in a minor subject. For preliminary examinations, the student will present four fields, all in history or three in history and one in a minor field. The student will be certified in a fifth field, either in history or in a minor subject, by taking courses and passing them to the satisfaction of the advisory committee and the professors in that field. Not more than three fields may fall within any one of the above divisions. The preliminary examinations will consist of a three-hour written examination in each of his four fields and a two-hour oral examination covering all fields.

After completing his 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 American history, Latin American history, or European history. Subjects in American history may fall within any field listed in division I above. Subjects in Latin American history may fall within any field listed in division II. Subjects in European history may be chosen from selected topics in modern continental 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 chairman, Department of History.

Home Economics Education

(See Vocational Education Studies for program description)

Instructional Materials

(See Educational Media under Curriculum, Instruction and Media for program description)

Journalism

The School of Journalism offers graduate programs leading to the Master of Arts and the Doctor of Philosophy degrees in journalism. Students in the journalism programs may concentrate their work in these general areas: media history,

behavioral studies, legal studies in communication, and mass media and society. The Master of Arts and Ph.D. degrees are research degrees culminating in the preparation of a thesis or dissertation. The student is 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 a subject.

Admission to the Degree Program

Students seeking admission should consult the appropriate section of the Graduate Catalog. GRE Aptitude Test scores must be submitted to complete the application for admission. Students without a previous journalism degree or professional media background are required to take some undergraduate courses for no credit as a way of building background. The amount of this course work will be determined by the adviser in consultation with the faculty. A TOEFL score of 600 or higher is required of *all* foreign students, except those from English-speaking countries.

Master of Arts Degree

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 or comprehensive examination results indicate 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.

When all course work has been completed (with all incomplete and deferred grades removed) with a minimum 3.0 grade point average, each student must choose one of two alternatives: (1) Pass a written comprehensive examination covering history of the mass media, communication law, communication theory, and an appropriate research methodology. An oral examination is also required. (2) Prepare and present before a committee of three School of Journalism faculty members a comprehensive review and critique of the literature in a selected area of mass communication studies. A rigorous oral examination over the area will follow the presentation. Either alternative (1) or (2) must be completed prior to completion of the student's fourth term of residence, including summer term.

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 on comprehensive examinations (or on the paper or defense of the paper prepared in lieu of the examinations), 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.

Doctor of Philosophy Degree

Minimum course requirements for the Ph.D. degree include 38-40 semester hours beyond the master's degree. 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; the remaining hours will be earned in a non-journalism 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.

Students must maintain a 3.25 average in course work taken at Southern Illinois

University at Carbondale, and may be required to take extra work if any grades of *C* or lower are earned at Southern Illinois University at Carbondale.

During the second semester of study, each Ph.D. student will prepare a total program plan for the degree. 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 the 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:

Journalism 500 and 501 (Research Design)

Journalism 530 and History 492 (Historiography)

Guidance 506 and 507 (Statistics)

Journalism 540 and History 461A or 461B or Political Science 433A or 433B (Legal Research)

Computer Programming (courses to be selected)

Modern Foreign Language

Courses listed as tools are subject to change without notice at times when departments change course content, titles, or numbers. Only grades of *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. The form and scope of the examinations are at the discretion of the graduate faculty members in the School of Journalism, but ordinarily the tests examine the student's grasp of mass media history, communication law, communication theory, an appropriate research methodology, and an area outside of Journalism that is relevant to the student's studies.

Each student prepares a dissertation proposal, defends and explains the proposal to his or her committee, and completes the research and writes the dissertation. Within one year after admission to candidacy, the student must have a written dissertation proposal approved by his or her committee. The dissertation 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.

The dissertation defense will be held before members of the dissertation committee (all of whom must be present) and interested observers. Although others than committee members may ask questions of the student, the pass or fail decision on the oral will be made by committee members only.

Latin American Studies

The Master of Arts degree in Latin American studies is earned through an interdisciplinary program of courses offered in the Departments of Agricultural Indus-

tries, Animal Industries, Anthropology, Botany, Economics, Foreign Languages and Literature, Geography, History, Marketing, Philosophy, Plant and Soil Science, and Political Science. Southern Illinois University at Carbondale has a distinguished faculty of Latin Americanists and the Latin American holdings of the Morris Library are extensive. The program is supervised by the Latin American studies advisory committee.

Prerequisites for the masters degree include a basic knowledge of the Latin American area obtained through previous academic work, independent study or personal experience in the region. Students also must demonstrate language skills (in Spanish, Portuguese or both) appropriate to their career goals. The chairman of the Latin American studies advisory committee will determine if the student has met these prerequisites and prescribe additional work to eliminate any deficiencies.

Requirements for the Master of Arts Degree

1. The completion of at least 20 hours in courses pertinent to the Latin American area offered for graduate credit in one of the departments listed above.
2. The completion of a minimum of 10 hours in complementary courses approved by the student's supervisory committee. To meet this requirement students may select offerings in a maximum of three fields.
3. The completion of a satisfactory thesis on a Latin American topic in the major department. Students will receive 3 to 6 hours of credit for the thesis. Three of these hours may count toward the 20 hour requirement in the major department.

In every case the student's final program must be approved by the supervisory committee, acting under the policies established by the Latin American studies advisory committee, in accordance with the rules of the Graduate School.

Linguistics

Graduate courses in theoretical and applied linguistics are offered leading to the Master of Arts degree in linguistics or to the Master of Arts degree in English as a Foreign Language. Both 400- and 500-level courses are offered for a minor in linguistics, and in English as a Foreign Language. Applicants for admission should send inquiries to the chairperson, Department of Linguistics, Southern Illinois University, Carbondale, Illinois 62901.

Admissions. Applicants for admission to either degree program, besides meeting the general conditions for admission to the Graduate School, must have an undergraduate GPA of at least 2.7 (A = 4.0). Applicants with GPA's between 2.4 and 2.7 may be granted conditional admission. (Students admitted on a conditional basis must earn a graduate GPA of 3.0 after the first 12 hours of coursework taken in their program; failure to do so will result in the student's being dropped from the program.) In addition, applicants who are not native speakers of English must have a TOEFL score of at least 550. Applicants are encouraged to submit GRE scores in the support of their application for admission. An undergraduate background or work experience in one of the following fields is desirable but not required: anthropology, English, foreign languages, mathematics, philosophy, psychology, speech, sociology.

Preprofessional Assignments. As a vital part of his graduate educational experience each student must be engaged in an appropriate research or teaching assignment each term. These assignments vary according to the needs and professional goals of the student. They are designed to supplement the formal course work with

a variety of preprofessional activities in research and teaching, under staff supervision.

The amount of time required of the student varies according to the progress made, the type of assignment, etc. The purpose of these assignments is to expose the student to some of the types of activities that will ultimately be engaged in after receiving the M.A. degree. Performance on these assignments is evaluated.

Retention. Students admitted on a conditional basis because of having a GPA between 2.4 and 2.7 must earn a graduate GPA of 3.0 after the first 12 hours of course work taken in their programs; failure to do so will result in the student's being dropped from the program.

If, after one term on academic probation, as defined either by the Graduate School or herein, any students who fail to return to good standing, will not be entitled to financial assistance from the department. If, after 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. On that academic probation the above stipulations for financial assistance and for being dropped from the program apply.

Comprehensive Examination. Toward the end of their course work, students must take and pass a written comprehensive 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, students must have at least a 3.0 GPA when the examination is given. Students having a GPA just below 3.0 may petition the department's executive committee for a special waiver of this 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 Linguistics

Applicants for admission to the linguistics program must satisfy the following prerequisites: coursework corresponding to articulatory phonetics (402a) and general linguistics (401).

Applicants with partial deficiencies in these prerequisites may be provisionally admitted until the prerequisites are met. With regard to these prerequisite courses (which do not carry degree credit), the student who believes himself capable in the material of any of these courses may ask that a proficiency examination be administered. Such an examination will be equal in scope to that usually given at the end of the course.

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. In cases in which there is doubt about the currency or the degree of proficiency, such proficiency must be demonstrated by obtaining at least a grade of *B* in the appropriate Foreign Languages 288b 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.

A thesis is required for the M.A. degree in linguistics. The student, in consultation with the departmental graduate adviser, shall propose a topic and a chairman and two other faculty members to serve as the thesis committee; the executive committee of the department must approve the topic and the structure of the thesis committee. The chairman 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. The topic of the thesis may come from the major field of linguistics, or from the area of the student's minor, with the stipulation that the topic be demonstrably related to the major in linguistics. In the latter case, the thesis committee may be co-chaired by a faculty member outside the Department of Linguistics. In addition to the copies required by the Graduate School and requested by committee members, the student must submit a copy of the thesis to the department.

The total credit requirement is a minimum of 32 credit hours; a minimum of 15 of these hours must be at the 500-level. Students are encouraged to attend the summer linguistic institute of the Linguistic Society of America; credit will be allowed for course work successfully completed.

Major Requirements: the following 19 hours of linguistics:

405 Phonological Theory	4
408 Syntactic Theory	4
415 Sociolinguistics	3
506 Historical Linguistics	4
550 Seminar in Linguistics	4
Thesis requirement:	
599 Thesis (minimum 3, max. 6 hrs.)	3
Minor requirement:	
10 hours of courses relevant to linguistics	10

A wide variety of courses which will interest the linguistics major is offered both within and outside the department. In consultation with an adviser, the student should structure a coherent minor. Possible areas are psycholinguistics, sociolinguistics, language, and culture, language area studies, instrumental phonetics, language and literature/stylistics. If the student with a major in linguistics wishes to choose English as a Foreign Language as a coherent minor, the department requires the following:

Minor in English as a Foreign Language (for linguistics majors), 10 hours	
570 Theory and Methods of EFL/ESL	3
580 Seminar in Special Problems of EFL/ESL	3
581 Practicum in EFL/ESL: Oral English	2
585 Practicum in EFL/ESL: Written English	2

If the student can demonstrate equivalent experience or academic credit for any of the above course requirements, other appropriate courses may be substituted to make up the total number of required hours.

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 must have an undergraduate concentration in English language or literature, or the equivalent in practical experience. They must also demonstrate spoken and written proficiency in English, which is measured by department diagnostic examinations given when students enter the program. Students not able to pass these tests must take suitable remedial work provided for by the department. The Master of Arts Degree will be awarded to non-native English-speaking students only when they have demonstrated satisfactory proficiency in spoken and written English, in addition to meeting the regular degree requirements.

All students entering the program must demonstrate a minimum level of knowledge of traditional English grammar. This is tested by a department diagnostic examination. Students not able to pass the test must undertake prescribed individual grammatical study until they are able to attain the required proficiency level.

The EFL program at Southern Illinois University is uniquely different from

many such programs in the way it blends theory and practical matters; it prepares the student 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 sequence of the EFL program is based upon the application of theoretical linguistics to EFL pedagogy. In addition, the EFL program provides for practice in control of gestures, tone of voice, and tempo of class management as practical aspects of pedagogy. Thus, graduates of this program are prepared to be teacher-trainers as well as 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). 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 undergraduate grammar courses (i.e. GSD 104). 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: (10 hours of EFL courses; 7 hours of linguistics courses)

570	Theory and Methods of EFL/ESL	3
580	Seminar on Special Problems of EFL/ESL	3
581	Practicum in EFL/ESL: Oral English	2
585	Practicum in EFL/ESL: Written English	2
<i>Total</i>		10
401	General Linguistics	4
402a	Articulatory Phonetics	3
<i>Total</i>		7

Approved electives: (15 hours, at least 9 of which must be chosen from the following list)

571	Language Laboratories	2
572	Materials Preparation in EFL/ESL	2
501	Contrastive Linguistics	3
403	English Phonology	3
408	Syntactic Theory	4
415	Sociolinguistics	3

The additional 6 hours of electives may be chosen from the above list, from other linguistic department offerings, or, in consultation with the departmental graduate adviser, courses in other departments which may be related to the student's program and interests.

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 SIU. 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 exempt from this requirement.

A thesis is not required for the MA degree in English as a foreign language; however, such a candidate may optionally choose to write a thesis. In that case, the thesis policy and guidelines for the MA in 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/copies required by the Graduate School, the student must submit a copy to the department.

A certificate of attendance will be granted to those students who do not satisfy the graduation GPA requirement (3.0) or the comprehensive examination requirement.

Mathematics

Graduate work in mathematics is offered leading to the Master of Science, Master of Arts, and Doctor of Philosophy degrees in mathematics. A program may be developed for a teaching specialty in mathematics in the Master of Science in Education degree in secondary education or in higher education. Minor work for graduate degrees in other fields, which allow for a minor, is also offered. In addition to general rules, regulations, and requirements of the Graduate School, the following specific requirements pertain to the degrees available in mathematics.

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. For unconditional acceptance the student will be expected to have taken a sufficient number of undergraduate courses in mathematics, including a course in linear algebra, in preparation for the graduate program, as would be in the case of a strong undergraduate major in mathematics or a minor in mathematics with a major in a related discipline.

Students will also be expected to have completed a year of French, German, or Russian or to have a working knowledge of a computer programming language (such as is covered in Computer Science 202 and either 302 or 311). A student who does not fully meet these conditions may be admitted conditionally but will be expected to remedy any deficiencies in undergraduate preparation.

Master of Science Degree

1. Graduate credit must total at least 30 semester hours of which at least 15 must be at the 500 level. This will ordinarily be in courses offered by the Department of Mathematics unless an approved minor is taken outside the department; in this case at least 21 semester hours of graduate credit must be in courses offered by the Department of Mathematics. (One such approved minor in Operations Research-Management Science consists of courses BA 501, BA 541, BA 544.)
2. The candidate's program must include at least one course from each of four of the following areas: (i) pure and applied algebra; (ii) pure analysis; (iii) applied analysis; (iv) geometry and topology; (v) probability and statistics. This requirement may be met in whole or in part by means of courses taken elsewhere prior to acceptance for graduate study in the department; such courses must be judged comparable to corresponding 400 or 500 level courses offered by the department.
3. The student must demonstrate ability formally to communicate mathematical concepts either by preparing a research paper (3 hours credit in Math 595) or by successfully completing at least two semesters of the master's seminar, Math 550k (a total of 3 hours credit required), including the preparation of a research report based on one of his seminar presentations.

4. At the completion of the program, the student must demonstrate satisfactory performance on an oral examination based on course work and a research paper or report. The examination will be administered by a committee appointed by the chairman of the department.

Master of Arts Degree

1. Graduate credit must total at least 30 semester hours of which at least 15 must be at the 500 level. This will ordinarily be in courses offered by the Department of Mathematics.
2. The candidate's program must include at least one course from each of four of the following areas: (i) pure and applied algebra; (ii) pure analysis; (iii) applied analysis; (iv) geometry and topology; (v) probability and statistics. This requirement may be met in whole or in part by means of courses taken elsewhere prior to acceptance for graduate study in the department; such courses must be judged comparable to corresponding 400 or 500-level courses offered by the department. The candidate must take each of the courses (or have taken the equivalent elsewhere) Math 419, 421, 433 or 437, 452, and at least four mathematics courses at the 500 level.
3. The candidate must demonstrate ability to read mathematical literature in French, German, or Russian. This requirement may be met in any of the following ways: (1) by passing an examination given by the Educational Testing Service of Princeton, New Jersey; (2) by passing an examination given by the foreign language examining committee of the mathematics department; (3) by passing with a grade of *B* or better, the b part of the research tool course (in the language elected) offered by the Department of Foreign Languages and Literatures.
4. The candidate must write a thesis carrying 3 to 6 semester hours of credit in Math 599.
5. The candidate must exhibit distinguished performance in course work, the thesis, and on an oral examination based on them given at the completion of the program. The examination will be administered by a committee appointed by the chairman of the department.

Doctor of Philosophy Degree

A student will be considered for acceptance into the Ph.D. program if above average performance in graduate work has been demonstrated comparable to that required for a master's degree at most American universities.

Once accepted, the requirements are:

1. Satisfactory performance on a comprehensive examination in three areas of mathematics over material commensurate with that covered in three 500 level courses not including 514, 515; at least two of the areas must be selected from those represented by Math 501, 520, 530, 555. The examination will normally be taken in August at the beginning of the student's second year in the Ph.D. program.
2. Demonstrated reading competence in mathematics in two of the three languages: French, German, Russian. One language may be replaced by passing Computer Science 302 or 311 with at least a grade of *B*. The language requirement may be met in any of the following ways: (1) by passing an examination given by the Educational Testing Service of Princeton, New Jersey; (2) by passing an examination given by the foreign language examining committee of the mathematics department; (3) by passing with a grade of *B* or better, the b part of the research tool course (in languages elected) offered by the Department of Foreign Languages and Literatures.
3. Completion during the first year in the program of any of the courses 501, 520, 530, 555 not previously taken at SIU at Carbondale or elsewhere at an equivalent level. Course work must include 12 hours in one field as a major

concentration and 6 hours in each of two other fields (minors) from the following list: algebra; analysis; applied mathematics; differential equations; logic; number theory; probability and statistics; topology and geometry. The course work in the major and minor areas must be at the 500 level and be exclusive of the courses 501, 520, 530, 555.

4. Satisfactory performance on a preliminary written and oral examination on the student's major and minor areas. The written exam will be confined to the student's major area; the oral exam will cover both major and minor areas. The preliminary examination will ordinarily be taken after completion of the language (research tool) requirement and 24 hours of credit in the program. However, the student should pass his preliminary examination by the end of the academic year following that in which he passed his comprehensive examination.
5. A dissertation (representing at least 24 hours of credit in Mathematics 600) demonstrating the candidate's capacity for original and independent research in the concentration chosen from the following list: algebra; analysis; applied mathematics; differential equations; probability and statistics; number theory; topology and geometry. This list is subject to change due to changes in the graduate faculty. Candidates must pass an oral examination on their dissertation.

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 a basic knowledge of the field of microbiology as well as to allow each student to specialize in some particular area of study with the goal of developing microbiologists with a broad perspective and scientific sophistication who will advance human knowledge and meet the changing needs of society.

Admission and Advisement

Prospective graduate students must submit separate application forms obtainable from the Graduate School and the Department of Microbiology. Graduate Record Examination (GRE) scores and three letters of recommendation are required as part of the departmental application.

Admission to the doctoral program in microbiology requires a master's degree, or its equivalent, a minimum grade point average in graduate work of 3.25, and 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 assist the student in arranging for a graduate faculty advisory committee and its chairman to assume the continuing responsibility of planning the program of study and directing the research project for the degree.

Master's Degree

Each candidate for the master's degree is required to complete 30 semester hours of acceptable graduate credit, an approved thesis, and pass a comprehensive examination. 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 courses numbered 500 or above. Within the 15 semester hours of 500 level credit, each student must successfully complete 10 semester hours of credit selected from departmental courses numbered 502, 504, 505, 540, 542, 551, 562, 564, taken once.

The remaining credit hours requirements may be elected from the 400 and 500 level courses in the department or *other* departments with the approval of the

graduate adviser. Additional credits may be earned in courses 504 and 505 provided that they are repeated with different instructors.

During each semester, every graduate student is expected to register for Microbiology 500 (Seminar) either for credit or audit.

Copies of the draft thesis must be submitted to the advisory committee and the department chairman at least six (6) weeks before commencement. Each candidate for a master's degree is required to pass a comprehensive final examination administered by the advisory committee. The approved thesis, in final form, must be submitted to the dean of the Graduate School at least three (3) weeks before commencement.

Doctoral Degree

Each prospective candidate for the doctorate is required to complete 96 semester hours of acceptable graduate credit including 24 hours of dissertation credit, satisfy the statistics requirement, pass the qualifying examination, write and defend an acceptable dissertation based on a laboratory research problem, and spend at least two consecutive semesters in residence after admission to the doctoral program and before admission to candidacy.

All students will be expected to complete a core of courses consisting of 403-2, 404-2, 425a,b-4, 426a,b-4, 441-3, 442-2, 451-3, 452-2, 460-3, and 461-3, or their equivalent.

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 advisory committee.

During each semester, every graduate student is expected to register for Microbiology 500 (Seminar) for credit or audit.

Students may petition the department to accept credit earned in the master's program toward the credit requirements of the doctoral program.

The microbiology department requires that all students enrolled in the doctoral program present evidence of competence in statistics by earning a grade average of *B* in a series of courses or by passing a proficiency exam (administered by the course instructor) equivalent to one of the series of courses as follows:

1. Guidance 506 and 507
2. Mathematics 483 and 487
3. Mathematics 514 and 515

Students must satisfy the statistics requirements before taking the qualifying examination. After passing the qualifying examination, the student is advanced to candidacy for the doctorate.

The qualifying examination will consist of the three parts which are indicated below.

1. General Microbiology

This examination will be constructed and graded by the entire faculty.

2. Area of Concentration

The nature of this area, either a departmental or interdisciplinary speciality, shall be determined by the student together with his advisory committee and the chairman. The examination shall be prepared and graded by the chairman of the advisory committee.

3. Outside Area

The nature of this area, involving one or more departments or areas outside of the department shall be determined by the student, together with his advisory committee and the chairman. The examination shall be prepared and graded by a faculty member outside of the department.

In order to pass the qualifying examination, students must satisfy every member of the examining committee. If they fail to do so, they will fall in one of three categories. (1) They may fail and be denied a re-examination. (2) They may fail and be given an opportunity to be reexamined after an interval of time agreed upon by

the student and the chairman of the committee. (3) They may be required to repeat a part of the examination. This re-examination will be conducted by the member(s) dissenting from passing the student initially.

Students working towards the doctoral degree should consider the following steps applicable to the dissertation:

1. The student and the chairman 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 his 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

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

Graduate students in Mining Engineering are required to take one term of internship in coal industries, research institutes, or governmental agencies for practical experience during the early stages of their advanced study. For this activity, the student will earn appropriate credits (up to 3 semester hours) as determined by the instructor.

Every student is required to enroll in the course MNGE 550 for one term and to submit a term paper describing the work conducted and knowledge gained during the internship period.

Assistantships and fellowships are available for qualified applicants. Additional information about programs, courses, assistantships and fellowships may be obtained from the School of Engineering and Technology.

Molecular Science

Molecular Science is an interdisciplinary program designed to provide advanced education for those students who desire to pursue scientific careers which require understanding at the molecular level. The program encompasses a number of interdisciplinary areas such as: atomic-nuclear-molecular science, biochemistry, biophysics, geochemistry, geophysics, materials science, theoretical physics and applied mathematics, and molecular biology.

Students may enter the program from diverse educational backgrounds including the physical, engineering, and life sciences, and mathematics.

Admission to Graduate Study

Qualified students holding the baccalaureate degree in any of the physical sciences, life sciences, mathematics, or engineering are admissible to graduate study in preparation for subsequent admission to doctoral candidacy in molecular science. In addition to the other subject matter they may have studied, students should have the following background:

Mathematics — at least two semesters of calculus

Chemistry — through organic chemistry

Physics — two semesters of calculus-based physics

Biology — two semesters of biology above the level of General Studies.

Since the program in molecular science is interdisciplinary and broadly based, it is anticipated that many students entering the program will not have the background indicated above. The deficiencies in these areas must be corrected. This can be done either by taking the appropriate course work, or by proficiency examinations administered by members of the molecular science faculty or the appropriate department.

The First Year of Graduate Study

During the first year the student will enroll in three five-semester hour courses in molecular science. An unusually well-qualified student may meet the requirements of these courses by passing appropriate examinations. These are the only courses, other than dissertation, which are required for the Ph.D. degree in molecular science. Thus, all mandatory course work may be completed during the first

year of study. To round out the first year program the student, with the aid of an adviser, will select other courses relevant to molecular science.

Retention in the Program

After completion of the three courses in molecular science, the performance of each student in these courses and in remedial and supplementary courses 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 the Molecular Science Program

Admission to the Ph.D. degree program in molecular science requires a master's degree or its equivalent from any of the physical or life sciences, mathematics, or engineering. In addition the student must have a grade point average in graduate work of at least 3.25, and complete the first year of study with certification of the executive committee, as described above.

A student who does not have an appropriate master's degree will seek master's equivalency from the Graduate School, usually by the end of his second year of graduate study. 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 on the student's knowledge of research techniques, and which is based on a special research project.

Admission to Candidacy for the Ph.D.

Permission to apply to the Graduate School for admission to candidacy for the Ph.D. degree requires the satisfactory completion of the research tool requirement and the passing of the Ph.D. preliminary examination.

The research tool requirement is intended to be an integral part of the student's program. The molecular science program requires a single research tool. The student can satisfy this requirement either by passing the ETS examination in French, German, or Russian languages, or by demonstrating competence in computer programming.

The degree of a student's command of the basic disciplines dealt with in the molecular science program at the graduate level is checked by means of a preliminary examination before he or she is admitted to candidacy for the Ph.D. degree. The examination consists of a written part followed by an oral examination. The student will be asked to indicate which three areas among the six listed below to be tested on:

- (a) Quantum Theory — Molecular Spectroscopy
- (b) Statistical Mechanics — Thermodynamics
- (c) Materials Science
- (d) Applied Mathematics
- (e) Biochemistry
- (f) Biophysics

In addition, students will be examined in depth by written test on a specialty area of their choosing.

Requirements for the Ph.D. in Molecular Science

A candidate for the Ph.D. degree must meet the general requirements as set forth by the Graduate School. Specifically, he must submit a dissertation and defend it with distinction before a dissertation committee.

For complete details, the chairman of the molecular science program should be consulted.

Music

The School of Music offers programs leading to the Master of Music degree and to the Master of Music Education 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 in education, with a concentration in secondary education, may choose the elective portion of their programs from graduate courses offered in the School of Music.

Master of Music Degree Standard Curricula

History-Literature. Majors complete Music 501-3; 502-4 (2, 2); 2 credits in 414 or other performing ensembles; 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.

Theory-Composition. 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 selected from 566, 414, 567, or 568; 599-6; 5 credits of approved music electives in theory-composition, history-literature, conducting, or performance.

Performance. Majors complete Music 501-3, 502a or b (2); 5 credits from 461, 482, or 470-570 series; 8 credits in 540 (440 is specializing in pedagogy); 2 credits from 566, 414, 567, or 568 (or other electives if keyboard major); 6 credits in 595 and 598 (recital and document); 4 credits in non-performing music electives. If specializing in conducting, majors must complete Music 501-3; 502-4 (2, 2); 556-4 (2, 2); 3-6 credits from the 470-570 series; 2-4 credits in 440; 2-3 credits from 566, 414, 567, or 568; 6 credits in 595 and 598 (recital and document); 3 credits in music electives.

Opera/Music Theater. Opera and music theater majors must have an undergraduate degree 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. Majors complete Music 468-2; 4 credits from 567 or 568; 12 credits selected from 440-540, 461, 501, 570, 556, 567, 568; six credits selected from Theater 402a, b; or 404; 409; 412, 415, 417; 432; 505; and six credits from Music 499 and 595; or 598 and 595; or 599.

Master of Music Education Degree Standard Curriculum

Majors complete Music 503-3 (or 501-3); 502 a or b (2); 4-5 credits from 509, 550, or 460; 7-8 credits selected from music education courses; 2 credits from 566, 414, 567, or 568; 5 credits elected from non-music education courses including at least one course from 410, 482, or the 470-570 series; 599-6 or six credits from 499 and 595; or 595 and 598; or from approved electives in music or related fields.

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 usually range from \$30 to \$60 per term.

Advisement. After initial advisement by the graduate coordinator in music, each entering student will be assigned a faculty adviser. The adviser for a student with a performance major will normally be the student's instructor in performance. Assignments of advisers in music theory, education, and history literature will be

made on a rotational basis from faculty in those areas, unless otherwise requested by the student. The faculty adviser supervises the overall planning of the student's program and consults with the student and the graduate coordinator in regard to the eventual designation of a 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 specialized 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.

Exceptions to Degree Requirements. Appropriate substitutions in or for the curricula for either the Master of Music degree or the Master of Music Education 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 specialized sequence of course offerings, following the above curricular patterns as far as possible. All specialized 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, or (4) courses which involve research papers or creative projects demonstrating professional abilities equivalent to the above.

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 and the student's adviser—will designate a document or thesis director from the current list of graduate faculty serving in that capacity. Exceptions to this procedure must be approved by the music graduate committee. 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 extensive work is done 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 or adviser. This jury approves the level of literature to be performed and the quality of performance by audition in advance of the final performance, the acceptability of which must also be judged by the performance jury.

Although the Master of Music Education degree does not require a thesis or document, the student may elect to write one and enroll in Music 599 or 595.

Students working toward the Master of Music Education degree who do not elect to write a thesis or document must complete six hours of course work including

research terminating with a paper or papers following thesis style. These research papers are filed with the graduate coordinator for music.

Three copies of all theses, thesis-composition manuscripts and tapes, documents, and research papers 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 the document or thesis director, when applicable. The coordinator of graduate studies will forward two copies to the Graduate School and retain one copy. Guidelines for preparing theses and documents are available from the Graduate School and the music graduate office.

Comprehensive Examinations. During the final semester of study, the student will take comprehensive examinations, written and oral, 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 not later than five weeks before the expected date of graduation, and the examinations must be passed no later than three weeks before graduation. 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 representing the student's areas of concentration to assist, 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 may supply questions for the student's written examination under the general supervision of the music graduate committee.

Occupational Education

(See Vocational Education Studies for program description.)

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. Three official transcripts of the applicant's record to be sent to the Graduate School.
3. Three letters of recommendation from individuals familiar with his/her work should be requested by the applicant to be sent to the department's director of graduate studies.

4. Scores for the Graduate Record Examination verbal and quantitative aptitude tests to be submitted by native English speaking applicants to the graduate school. Doctoral applicants should also submit scores on the GRE advanced test in philosophy. The department may, where other evidence of competence seems so to warrant, accept a candidate on the condition that he/she later submit acceptable scores. Foreign-born applicants from countries where English is not the native language should submit TOEFL scores in lieu of GRE scores to the office of foreign admissions.

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 fellowships and special doctoral assistantships 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 masters 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 towards 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 288b 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 subject of his/her research.

Teaching Masters 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 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 his 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 prior to taking the preliminary examination.
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 288b 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; 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.

Physical Education

Graduate courses in physical education are offered toward the Master of Science in Education degree in physical education or toward a concentration for the Doctor of Philosophy degree in 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 20 for a major or 10 for a minor. 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 at least the equivalent of an undergraduate minor (preferably a major) in physical education.

3. Presentation of at least one undergraduate course in kinesiology and at least one in educational psychology or psychology of the particular field of the student's specialty.
4. Possession of the ability to teach and demonstrate an acceptable variety of skills and techniques in physical education activity.

A student may be conditionally admitted to the program and may be permitted to do graduate course work while he removes 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.

Minor

Students with a major in a related area may take a minor in physical education. This consists of 10 hours chosen from one of the areas of concentration in consultation with a physical education adviser.

Requirements

The Department of Physical Education offers programs in several areas. Core courses common to all concentrations are P.E. 500, 503, and either 592 or 599. The courses are designed to provide common experiences to all students regardless of their specialization. For 599 three copies of the thesis must be bound and deposited with the department. Two unbound copies are deposited with the Graduate School.

Areas of Concentration

THE EXPERIMENTAL PHYSICAL EDUCATION PROGRAM

This program is intended to prepare students to enter advanced study and to perform scholarly research which emphasizes depth in a selected science. A student, in conference with an adviser, designs a program which satisfies the student's special interest.

THE PROFESSIONAL PHYSICAL EDUCATION PROGRAM

This program is designed to develop a high level of competency in teaching physical education in colleges, secondary, and elementary schools. The student, in conference with an adviser, designs a program which satisfies the student's special interest.

THE APPLIED PHYSICAL EDUCATION PROGRAM

The purpose of this program is to prepare coaches of athletic teams to (1) increase their knowledge of fundamental principles which are basic to the coaching and administration of athletics and (2) to develop a broad perspective of the role of athletics in the total education environment.

Physics and Astronomy

The Department of Physics and Astronomy offers graduate work leading to the Master of Arts and Master of Science Degrees in physics. Graduate courses in physics may also be taken to satisfy teaching specialty requirements for the Master of Science in Education degree 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, and Physics 520A. 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 University's Student Affairs Research and Evaluation Center.

The M.A. degree 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 a similar examination for testing computer skill. English can be substituted for either of the above requirements at the discretion of the graduate adviser provided it is not the native tongue 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 in physiology. Graduate courses in physiology may also contribute to a program leading to a Master of Science degree in biological sciences or to a teaching specialty for the Master of Science in Education degree 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 concentrating in one of these sub-disciplines. The advisory system in the department is set up to help the student in planning his work. All graduate training programs in the department are subject to approval of the graduate training committee of the department.

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 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 his 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, electronic 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 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 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 examination and an oral qualifying 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 referred 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 in plant and soil science with concentrations in the areas of crop, soil, and horticultural sciences; specialization 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 his 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, 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.

The School of Agriculture offers courses in plant and soil science as part of a residence-center program at Western Illinois University.

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 three official transcripts directly to the Graduate School. In addition applicants should send a letter directly to the chairman of the Department of Plant and Soil Science expressing their professional and personal career objectives. Applicants should also request that three persons who can evaluate the student's academic ability write letters directly to the chairman in their behalf. Final admission to the program and a particular concentration administered by the Department of Plant and Soil Sciences is made by the department. Minimal admission requirements to the program are: a) completion of the plant and soil science undergraduate requirements and b) a minimal grade point average of 2.7 (A = 4.0). The students who do not meet the requirement of completing the required courses in the undergraduate program in Plant and Soil Science may apply to enroll as an unclassified student 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 chairman 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. The departmental chairman will always serve on the examining committee.

Political Science

Graduate programs in the Department of Political Science may be designed to lead to a Master of Arts degree in political science, a Master of Public Affairs degree, or a Doctor of Philosophy degree in political science. Graduate work in political science may be taken to satisfy requirements for a teaching specialty for the Master of Science in Education degree in secondary education or in higher education. Graduate work in political science may also serve as a cognate field for a student majoring in another discipline.

Application Procedures

Application for admission to graduate study in political science should be directed to the Graduate School in conformity with the requirements specified in Chapter 1. In addition, supporting materials should be sent to the director of graduate studies, political science department. These materials consist of (1) the personal

and professional data form; (2) three letters of recommendation from persons who can evaluate the applicant's academic ability; (3) a careful explanation of reasons for seeking graduate study; and (4) 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. 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 forms for applying for financial assistance, may be obtained from the director of graduate studies, political science department. Applications and supporting materials should be submitted at least four weeks before the term of registration. Those applying for teaching 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 fields of concentration listed under the Ph.D. requirements. The selection of fields of concentration 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 the 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 fields of concentration 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 are counted as part of the 30 semester hours and (2) the tool courses are not counted as fulfilling one of the field requirements.

Thesis. In addition to the required course work, the student must submit a thesis, an internship report of thesis quality, or two research papers approved by a department committee as satisfactory demonstration of research ability. A student may receive a maximum of six hours credit for the thesis or internship report, but the student offering two research papers must complete 30 hours of course work. Before registering for thesis or internship 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 or internship committee approved by the director of graduate studies. The membership of the advisory committee and the thesis or internship committee need not be identical. A prospectus outlining the research proposed for the thesis or internship report must be approved by the members of the thesis or intership committee and filed with the director of graduate studies. The acceptability of the two research papers offered as an alternative to a thesis shall be determined by a committee consisting of the student's advisory committee and two members of the graduate studies committee appointed by the director of graduate studies.

A final oral examination conducted by the appropriate committee and open to the public will cover the thesis, internship report, or the two research papers 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, internship report, or research papers are rejected, the student may be dropped from the department's degree program or may submit a new or revised thesis, report or research papers, or repeat the examination at the discretion of the examining committee.

Copies of the thesis, internship report, or two research papers should be submitted to the student's thesis, internship or advisory committee members no later than one week before the scheduled final oral examination. A copy of the approved thesis, internship report or research papers 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

Applications for admission should be directed to the Graduate School and the director, master of public affairs program, political science department. Graduate Record Examination scores are not required although they are recommended if the applicant wishes to be considered for a fellowship from the Graduate School. To be considered for an assistantship from the M.P.A. program, a letter indicating interest and extent of financial need should be sent to the director prior to April 1, for awards beginning the following Fall. Applications are evaluated by the director, master of public affairs program, and the program's steering committee.

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 conditional admission. If a candidate's undergraduate background is inadequate preparation for specific graduate courses being planned, it may be necessary to enroll in preliminary or prerequisite courses at the undergraduate or graduate level. Graduate-level courses taken to remedy

undergraduate deficiencies may be applied to the degree on approval of the director.

Retention is governed by the standards of the Graduate School.

Requirements for completing the degree are: (1) satisfactory completion of courses as listed below; (2) completion of 36 semester hours of graduate credit, 15 of which must be on the 500 level; and (3) satisfactory performance in either an agency internship or an applied study project, for which up to 6 semester hours of graduate credit can be earned.

Core courses required of all candidates are advanced public administration, planning and budgeting systems, and advanced policy analysis. Before taking certain advanced courses, students must have acquired a basic knowledge of statistics. In addition, prerequisite courses are required in some instances.

The student must also complete the specified minimum number of hours in each of the following core areas, taking courses in any of several departments of the University which are certified by the director of the program as fulfilling area requirements:

1. Theory (3 semester hours minimum) — Courses in management theory or organization theory.
2. Techniques (6 semester hours minimum) — Courses in accounting, budgeting, public finance, personnel administration, collective bargaining, planning, statistics, computer science, research design and methods, policy analysis, information systems, and operations research.
3. Behavior and Institutions (6 semester hours minimum) — Courses in political, managerial, and organizational behavior, administrative institutions and processes, American government and politics, public policy, economics, sociology, political communication, labor relations, and urban geography.

Additional credits may be completed either in these areas or elsewhere in the graduate curriculum. In selecting these added credits, candidates are encouraged to consider courses in their substantive professional area, e.g., administration of justice, community development, educational administration, forestry, recreation, rehabilitation, social work, transportation and highway engineering, and water resources.

Students who have not taken an undergraduate course in public administration must audit POLS 340-3 or make other satisfactory arrangements. In addition, each candidate must have completed at least one graduate course in American government. The director must approve the student's initial program of study. This program should be tailored, to the extent possible, to the student's individual needs and interests and to those of the agency in which he is employed or intends to be employed, if known. Course work may be taken on a full-time or part-time basis, although all work must be completed within six years.

Candidates who have not had at least one year of professional experience in an approved government agency or related organization must enter an internship arranged or approved by the director. Candidates with one year or more of approved experience must undertake an approved applied study project. For either the internship or project a written report must be prepared, in accordance with a prospectus approved by an advisory committee (formed for this purpose), and filed with the director.

Each candidate shall satisfactorily complete a final oral examination, conducted by the advisory committee and open to the public. The examination may be given only after all course work is complete. It will cover the written report, the major area in which it is written, and the student's general competence in the fields studied. If the examination is failed more than once, the candidate is dropped from the program. A copy of the approved written report must be filed with the director and with the Graduate School before the student's graduation application will be approved.

An exception from these rules must be justified in a petition approved and signed

by the student's advisory committee members, submitted to the director, and approved by members of the program's steering committee at a previously scheduled meeting.

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.

Retention. Retention is governed by the rules of the Graduate School. Students should avoid accumulating incomplete grades. Students holding graduate student 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 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 fields of concentration.

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 an appointment) after admission to the Ph.D. program before preliminary examinations can be taken. Residence shall be counted from the time when the student passes the final examinations for the master's degree. An applicant wishing to meet the department's residence requirement by using Option II (see Chapter I of this Catalog) must submit a petition and a proposed program to the graduate studies committee at the time that the student applies for admission to the program.

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 field of concentration.

The student must take four written examinations with an oral examination following. The fields of concentration are: political theory or methodology; American Government and politics, public administration and policy analysis; comparative government and politics; international politics, law, and organization; a cognate or interdisciplinary field.

The examinations will be taken in four of these fields; or the student may, with the consent of the advisory committee, take examinations within two sub-fields of the field of primary concentration and in two other fields. Thus, for example, a student might take examinations in urban politics and in political parties within the American politics field, and also in international politics and political theory. The student must have completed a minimum of six hours of course work, including not more than three hours of readings or individual research, at the M.A. or Ph.D. level, in each field or sub-field of examination. In addition the student must complete the requirements for two research tools (see below) and the two Political Science 501 research methods courses best complementing the student's fields 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 fields of examination. At least half of all course work must be in 500 level courses.

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. If the students pass the written and oral examinations, they are advanced to candidacy for the Ph.D.; if they do not pass, they may be permitted to retake the examinations at a later date or be dropped from the degree program of the department, at the discretion of the examination committee.

Research Tools. All Ph.D. degree students must satisfy a statistics tool requirement by earning at least a *C* in 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 field 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 288a and b in the Department of Foreign Languages and Literatures with a minimum grade of *B* in 288b. Where the Department of Foreign Languages and Literatures recommends that the student start with 288b, the completion of the recommended course with a grade of *B* in 288b 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 and either Computer Science 302, 311f, 3111, 311p, 370, or an appropriate 400 level course, e.g. 403, 411, 430, or 470, with a grade of *C* or better required in the second course to fulfill the requirement.
2. Computer Science 202 and Political Science 503 with a grade of *C* or better required in each course to fulfill the requirement.
3. Computer Science 202 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 members of the committee need not be the same as the members of the preliminary advisory committee. A dissertation prospectus must be approved by the members of the dissertation committee and filed with the director of graduate studies. The student must register for a minimum of 24 hours of dissertation credit, and cannot register for dissertation credit until he or she has been admitted to candidacy or, with the approval of the advisory committee and the director of graduate studies, for 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 examination. The successful passing 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.

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 total 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 in psychology with concentrations in the following areas: experimental, clinical, bio-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 Southern Illinois University at Carbondale is to develop psychologists who will have a broad perspective and scientific sophistication as well as the requisite skills to advance the field of psychology and meet changing needs. The program emphasizes formal course work in the core curriculum and concentrations, and preprofessional activities in training assignments and in 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 and special doctoral assistantships. 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 entire program of study: required courses, planned electives, anticipated dates for fulfillment of specified requirements, etc. Upon formation of the thesis or dissertation committee, the chairman of that committee automatically becomes the student's academic adviser.

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 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. In consultation with the adviser, the student selects electives. Those in the experimental, bio-clinical and counseling programs select from any four of the following specialty areas, subject to the approval of the faculty teaching in those areas: cognitive, developmental, learning, personality, physiological, quantitative, sensation-perception, social, or any other area in the department or an approved area outside the department. Students in the clinical program, select from the above areas, with the stipulation that one of the electives must be from developmental or social and one must be from learning or physiological. The student should take these electives early in tenure to facilitate the integration of major and minor areas. All core requirements should be completed by the end of the seventh academic term of residence.

Areas of Concentration

EXPERIMENTAL PSYCHOLOGY

The concentration in experimental psychology offers a broad academic course of advanced study, primarily for students working toward careers in teaching and research. While the student may select courses from several areas, the student is expected to specialize in at least one area of experimental psychology: cognitive, developmental, learning, personality, physiological, quantitative, sensation-perception, social. The following courses are required: 409 (or its equivalent), 522c, a seminar in procedures and problems in clinical psychology, and a course in computer programming. The student is also required to take research credit during all but the first two semesters of residence.

CLINICAL PSYCHOLOGY

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: 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 specialty: (1) General clinical students are required to take an assessment practicum and an additional semester of therapy practicum plus 4 electives; (2) the experimental clinical students are expected in their six additional courses to take those which have a research orientation, e.g., 532, 533, 539, etc.; (3) students in the

child clinical specialty are required to take 432 and 556 plus 4 electives. In addition it is expected that they will take 552 and 554 as a part of departmental electives.

BIO-CLINICAL PSYCHOLOGY

The program is bio-medically oriented and is designed to place psychological research and clinical practice within the broad framework of the biological sciences. In order to train mental health scientist-practitioners for careers in medical, health-related and academic settings, a dual-track program is pursued in clinical psychology, and in either physiological psychology or learning processes.

The following courses are required: 415; two of the following — 509, 510, or 511; 514; 522c; 530a and b; 531; 535; 540; 598; 594e; 534 (behavior, therapy seminar); 585 (bio-clinical psychology seminar — 1 credit each semester during the first three academic years), computer programming, and medical neurosciences.

COUNSELING PSYCHOLOGY

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 be most useful in a university setting, either in an academic department or a counseling center.

Students may also be prepared for positions 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 and b, 538, 547, 548, 594f, and 598. In addition, the following electives are recommended: 531, 532, 539, and 585.

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.

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.

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 SIU at Carbondale must apply formally to the Graduate School for admission to doctoral-level study, and be approved by the department chairman.

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 majoring in clinical, bio-clinical or counseling psychology must complete an approved internship: 48 weeks for clinical and

bio-clinical students, and the equivalent of nine months for counseling students. The placement 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. The bio-clinical students must complete all academic work prior to internship. 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 on successful completion of written examinations in both the minor and major areas. Both examinations are composed primarily of essay questions that require substantive knowledge of experimental and theoretical topics. Questions are not limited to course content. The examinations are designed to ensure the breadth and depth in the student's training, encourage the student to organize and integrate knowledge, and inform the faculty as to the student's competence. The examinations are four hours in length for the minor and six hours in length for the major.

Every student is expected to pass each examination the first time it is taken. In any event, the student will not be permitted to take either the minor or the major exam more than twice.

Minors. 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. Fields of concentration for the preliminary examination in the major are listed below:

1. Experimental. Any one field from the following may be selected for the major examination: cognitive, developmental, learning, personality, physiological, quantitative, sensation-perception, social.
2. Clinical. The major examination includes the following: psychological assessment, psychotherapy, psychopathology, and personality. In addition, the examination reflects the specialization emphasis for each student.
3. Bio-clinical. The student takes two major level examinations: one in clinical psychology, and the other in learning processes or physiological psychology. Both examinations consist of material inherent to each area and of material especially relevant to bio-clinical psychology.

4. Counseling. The major examination includes two fields: (a) counseling, and (b) psychological evaluation.

The major 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 intention to take the examination. Examination committees are appointed by the chairman.

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 chairman, the student should arrange a meeting with him 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) for distribution to psychology faculty 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 chairman for filing in the student's permanent records. If major modifications are needed, the student may be asked to rewrite the prospectus, circulate the revised prospectus, arrange another committee meeting, and then file the revised prospectus as above. A prospectus must be approved at least one semester before graduation.

Style. The student has the option of writing the thesis or dissertation in the traditional fashion or in journal style. In the latter case, ancillary material (full survey of literature, subsidiary analyses, etc.) are placed in the appendices, although figures and tables appear in the text. The psychology department prefers that citations, table headings, etc. follow the APA style (Publication Manual of the American Psychological Association, 1974 revision, Washington, D.C.).

General Procedures. Students should not register for 599 or 600 hours until they have supervisors and will actually be using university facilities, or faculty time for assistance and direction.

Prior to graduation (a minimum of five weeks for master's students and eight weeks for doctoral students) the candidate must submit a final rough draft of the

thesis or dissertation to the full committee so that appropriate suggestions can be made. At least one week usually expires between the submission of the rough draft and the oral examination.

Number of Copies. Four copies of the complete thesis or dissertation are required: two copies are submitted to the Graduate School for placement in the University library, and two bound copies—one for the committee 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. The student who wishes to have a course waived should consult with the adviser. If the adviser agrees, the student submits a written petition to the major area committee, which decides how proficiency in the course will be determined.

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, plusses and minuses are added to the standard *A, B, C* grades reported to the registrar.

Student Evaluation. All students are evaluated by the faculty at least once a year, at the end of spring semester. In addition, new students are evaluated in the beginning of the spring semester (first year), and students on probation at times specified in their probation. The evaluation is based on the following criteria: (1) academic performance on a ten point rating scale ($A + = 10$); (2) ratings on the training assignment, and (3) progress toward the degree. The student's evaluation may also be based upon evidence concerning professional attitudes or ethical behavior.

Each student's adviser informs the student of the evaluation and of any faculty recommendations as soon as possible after the meeting. In addition, the department chairman writes a formal letter notifying the student of the evaluation and recommendations.

Public Affairs

(see Political Science for program description)

Public Visual Communications

The Master of Arts degree in public visual communications is sponsored jointly by the Departments of Cinema and Photography and Radio-Television and is intended to provide substantial advanced training in the theory, history, and practice of public communications. Emphasis in the program is upon the social influences and applications of the electronic and photographic media.

Within the general program students can elect to concentrate either in cinema, television, or still photography or any combination of cinema, television, or still photography in an interdisciplinary configuration.

In the cinema concentration students may specialize in film history, in film theory, or in motion picture production. In the television concentration work will ordinarily be limited to the theory and practice of public telecommunications in the areas of content development, audience analysis, media characteristics, management and administration, and social effects. In the still photography concentration students may specialize in history of photography, publications photography, scientific photography, or creative photography.

Acceptance in the program, and subsequent continuation in it, are at the discretion of the Graduate School and the program in public visual communications. Minimal admission requirements are those of the Graduate School. Prior to admission into the program, applicants will be expected to present evidence of their creative work, scholarship, and specifically, a minimum of 9 semester hours of courses in the social sciences to a program acceptance committee. In addition students will be expected to have a minimum of 18 semester hours in photography, film studies, or radio-television courses. Students who seek admission without undergraduate preparation in any of the above will be required to make up deficiencies before receiving graduate credit for work in this program. Courses taken to satisfy such undergraduate deficiencies will not apply toward the graduate degree.

Course hour requirements for the program are 30 semester hours. Of these, 6 hours must be in a department other than cinema and photography or radio-television, and 15 hours must be at the 500 level. All students in the program will be required to successfully complete the common core courses PVC 500, introduction to public visual communications; and, as capstone, PVC 589, seminar in public communications in a dynamic society. All television concentration students will be required to select two from among the following PVC Courses: 510, 530, 532, 570, 571, or 580. A 3.0 grade point (on a 4.0 scale) must be maintained for retention in the Program. It is expected that students will be in full-time residence for a minimum of one calendar year. If additional prerequisites are necessary, or if extensive creative work is involved, the program may require a longer period for completion.

A maximum of 12 hours of transfer credit may be petitioned into the student's program. An out-of-program course, designed to aid the student in the methodology and skills of research, may be required as agreed upon by the student's advisory committee. This course, however, will not qualify as meeting the program's minor requirements.

As soon as possible after admission to the degree program, and not later than the end of the first term in residence, the student will select a major adviser and a committee of two additional graduate faculty members. This committee will develop with the student a specific plan of study according to the requirements of the Graduate School, the program, and the goals of the student. The major adviser will

direct the thesis. Students will be reviewed by the graduate faculty for continuation in the program at the end of their first 12 hours of class work.

In all instances students will be held responsible for a comprehensive written examination over the entire work taken for the degree. An oral examination by the faculty advisory committee will normally constitute part of the graduation requirements.

Graduation requirements may, in part, be satisfied by a traditional written thesis or a final creative project. If the non-thesis option is chosen, the student must take the full 30 hours of coursework including 3-6 hours of PVC 597 resulting in a creative work presented to a public. A related essay or research paper will be submitted to the Graduate School as evidence of ability to undertake formal research. The University reserves the right to retain a sample of each student's work.

Recreation

The Department of Recreation offers a broad interdisciplinary program of studies preparing students for administrative careers in leisure education and recreation management. The program leads to the Master of Science in Education degree in recreation.

Graduate work in recreation stresses research and administration and is open only to highly qualified students. All students must be admitted to the Graduate School in good standing.

A minimum 30 semester hours of credit, no more than 3 of which may be for the thesis, constitute the basic course requirements for the M.S. in Ed. degree. At least 24 of these hours must be at the 500 level.

A student must maintain an overall 3.0 (4-point scale) grade point average in order to be eligible for the Master of Science in Education degree.

An advisory committee is chosen for each student. All elements of the student's program must receive the approval of this committee. A thesis or research paper is required for the Master of Science in Education degree, the topic of which is chosen in consultation with the adviser at the earliest practical time.

The final oral examination will cover the thesis or research paper and the major area in which it was written, and it may also test the candidate's general competence in the field of recreation.

A student admitted to the master's program in recreation will work closely with the adviser in designing a program to fit the needs for professional preparation in a chosen concentration.

The areas of concentration in recreation are: (1) park and community recreation, (2) recreation for special populations, (3) outdoor recreation, and (4) commercial recreation. Students are expected to complete (1) the core professional courses: Recreation 500, 520, 530, 550, and 570; (2) fifteen hours of electives in an area of concentration; (3) Recreation 599-3, a thesis in recreation, or Recreation 575-3 to 6, independent study conducted in a recreation setting. Students choosing the 575 option are required to write a research paper.

Rehabilitation Institute

In response to pressing human and social needs, the applied field of rehabilitation has solidly entrenched itself as a professional discipline over the past twenty years. Multidisciplinary courses of study have been drawn together from the behavioral, social, and medical sciences appropriate to the development of competent prac-

titioners, 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 a Master of Arts or a Master of Science degree in behavior modification, rehabilitation administration and services, and rehabilitation counseling. While rehabilitation administration and services requires a minimum of 30 semester hours of course work and field experience, behavior modification and rehabilitation counseling are 45 semester hour programs. The distinction between M.A. and M.S. degree 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 specialization. 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 MODIFICATION

The behavior modification program is a 45 semester hour program leading to either a M.A. or M.S. degree. Substantive courses are provided in therapeutic, instructional, and rehabilitative procedures that are based on learning and reinforcement principles. A program of study tailored to the interests of the individual student allows the student to acquire specific competencies in behavior modification with such special populations/settings as mental retardation, mental disorders, child behavior and classroom problems, sexual behavior, and behavior therapy.

A minimum of 30 hours of course work are required in addition to an internship and thesis or research paper. Of this 30 hours at least 18 hours must be selected from the didactic courses taught by behavior modification faculty. These courses normally include, but need not be limited to: Rehabilitation 409, 503, 508, 543, 545, 553, 554, 555, 564, 568, 577 and 584. The remaining hours may be taken in additional courses, practicum or independent study. Practical experience (Rehab. 594B) in a variety of field settings is a major part of the program.

A 12 week full-time internship at an affiliated training center under the supervision of a member of the behavior modification faculty is required. A student usually receives 9 hours of credit in Rehab. 595 for this experience. The student typically receives 6 hours credit for satisfactory completion of the M.S. research paper (Rehab. 593) or the M.A. thesis (Rehab. 599). Comprehensive examinations are satisfied through oral examination by the student's research or thesis advisory committee.

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 applied and action-oriented curriculum.

All students must complete a minimum of 30 semester hours of graduate course work and field experience 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 file and have approved a plan of study through an adviser with the concurrence of 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 Psychosocial Aspects of Disability
Rehb 593	3-6	Research in Rehabilitation
Rehb 594	3-6	Practicum in Rehabilitation
*Rehb 595	1-12	Internship in Rehabilitation
Student Choice	2-4	One course dealing with either the specialized setting or population with which the student plans to work. A Research Paper or Project

*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.)

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

SAMPLE PROFESSIONAL COURSE SEQUENCES*Rehabilitation Administration Sequence*

Rehb 570	3	Rehabilitation Administration
Rehb 573	2-3	Programming, Budgeting, and Community Resources
Rehb 576	2-3	Development and Supervision of Rehabilitation Employees
Rehb 579	3	Advanced Fiscal Management in Rehabilitation
Rehb 479	2	Technical Writing in Rehabilitation
Rehb 582	1-4	Seminar in Rehabilitation Services

Vocational Evaluation Sequence

Rehb 436	3-4	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	2	Technical Writing in Rehabilitation
Rehb 501	2	Rehabilitation Foundations

Adjustment Services Sequence

Rehb 436	3-4	Vocational Evaluation and Adjustment Services
Rehb 406	3	Introduction to Behavior Modification
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	2	Rehabilitation Foundations

Electives. The student is expected to complete his/her plan of study with other courses which are 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. The student may request waivers of both the practicum and internship requirements and in turn, ask that 6 to 12 semester hours of credit be granted for prior or concurrent work experience (REHB 494, Work Experience in Rehabilitation). Students granted this request will still be expected to complete at least 30 semester hours of graduate course work.

Waiver requests 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 Requirements. 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

This one and one-half calendar year program (45 credit hours) usually requires two semesters and a summer in addition to an internship to complete an M.A. or M.S. degree. The professional rehabilitation counselor must demonstrate competence in establishing a counseling relationship, guidance and vocational planning, assessment procedures, and job placement as well as have an awareness of professional and community resources. Students focus on a broad range of skills and resources necessary to facilitate the development of handicapped persons to maximum use of their abilities.

Required Courses

Rehab. 400, 501, 513, 421, 431, 451, 594, and 595. The student is given field work assignments on a weekly basis and must complete at least a three-month internship in a rehabilitation setting. Completion of a terminal project, research paper or experimental research project is required depending on the degree selected by the student.

There is sufficient flexibility in the curriculum so that special interests can be pursued by the student. By way of field training assignments, selected seminars and courses, the student gives special emphasis to certain client groups. Concen-

trations offered are in aging, corrections, mental retardation, mental health, and economic deprivation.

A comprehensive examination is required when the student has completed about two-thirds of his program.

Secondary Education

(See curriculum, Instruction and Media for program description)

Sociology

The Department of Sociology offers programs of graduate study leading to the Master of Arts and the Doctor of Philosophy degrees in sociology. The department ordinarily requires a grade point average of at least 3.0 for admission to the master's program and a minimum graduate grade point average of 3.5 for admission to the Doctor of Philosophy degree program. Graduate Record Examination scores on both the aptitude and the advanced (sociology) sections must be submitted with the application for admission.

Master of Arts Degree

A minimum of 30 semester hours is required for the master's degree, and the total number of hours may be taken entirely in sociology. Courses in other fields which are related to a student's program of study may, with approval of the adviser, count toward the total minimum hours.

There are no specific course requirements, but the student must pass a comprehensive written examination covering major areas of the discipline. Two of these areas, theory and methodology, are required by all students. The student must elect three additional areas from the following: social psychology; social organization; social and cultural change; the family; social disorganization, deviance and control; demography and ecology.

If the student fails to pass the examination or any part, the student may request re-examination appropriate to the case. Re-examination will be made at a time designated by the departmental graduate examination committee, usually no sooner than the next regularly scheduled examination period. The committee may elect to deny a request for re-examination after the student has failed twice.

A thesis or research paper is required for the degree. Up to 4 hours of individual research credit may be earned for the research paper and from 3 to 6 hours credit for thesis. The sociology master's programs should take about 4 terms of normal study to complete. Students on departmental stipends cannot expect continuance of such support beyond the second year of study at the master's level.

Students who have completed all requirements for the master's degree except the thesis or research paper may petition the academic affairs committee to be permitted to by-pass the master's degree and be admitted to the Ph.D. program. The committee will ask the Graduate School to certify that the student's previous work is equivalent to a master's degree.

This request must be followed by a formal application to the Graduate School for admission. The petition will be given consideration only under the following conditions:

1. The student has passed all sections of the comprehensive examination on the first trial and received grades of outstanding in a majority of the sections of the examination.
2. The student has achieved a grade-point average of at least 3.5 for all graduate courses taken in sociology prior to petition.

3. The student has completed all key sociology courses in required and elective areas of his program and has not acquired an excessive number of incomplete or deferred grades in other courses.

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 personal adviser.

As soon as possible, the student shall, in consultation with an 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 areas of examination. The committee is, with the consent of its members, formally appointed by the director of graduate studies and entered in the student's records along with his declared primary and secondary areas of examination.

Diagnostic Examination. A diagnostic examination for Ph.D. students shall be given in the Fall and Spring semesters. Students are required to take the examination the first time it is offered following their entrance into the program. This examination serves diagnostic purposes only and is intended to reveal special interests and abilities, as well as deficiencies, which need to be considered by the student and the adviser in planning a program of study. For students who have master's work in sociology at Southern Illinois University at Carbondale the M.A. comprehensive examination previously taken will serve as the diagnostic examination.

Areas of Examination. All students must declare two primary areas of examination, one of which must be sociological theory-methodology, and two secondary areas of examination. For students with a special interest in theory, the department offers a maximum examination area in sociological theory-methodology, corresponding to a combination of a primary and a secondary area.

At present, the department regularly offers the following primary and secondary areas of examination: theory-methodology, deviance and social control, quantitative methods, social change, social psychology, sociology of religion, sociology of science, sociology of the family.

Social organization (focusing on the city, community, complex organization or stratification) is also regularly open as an area of examination, but prior approval of a special study plan is required.

Other areas of examination may be offered in particular cases as student needs arise and faculty resources permit. Approval of a special area of examination must be obtained from the 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. 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 the formal course work, the students are expected to qualify themselves by independent reading in primary and secondary areas of examina-

tion. Students shall, with the assistance of the program committee, develop their own list of readings covering chosen areas of examination. As a general rule, the personal reading list shall include the most important works in each of the chosen areas. The final reading list must be approved by the program committee.

Comprehensive Examination. To qualify for the status of candidate for the Ph.D. degree, the student must pass a written comprehensive examination, which will be prepared by a special examination committee, consisting of the student's program committee supplemented as need may arise 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, upon the recommendation of the student's program committee, appointed by the chairman of the department graduate examination committee.

Normally, the comprehensive examination consists of six hours examination in each of the two primary areas of examination and three hours in each of the two secondary areas. In the case of a maximum examination in theory-methodology, there will normally be a three-hour general examination and a six-hour examination in the student's chosen area of theoretical emphasis as it appears in the reading list.

The examination may, at the request of the student, be taken in two parts, each consisting of a primary and secondary area of examination. The second part of the examination must be taken during the following regular semester. Failure to do so negates all examinations previously passed.

A student who fails to pass the examination in any declared areas must be re-examined in those areas. This re-examination must be taken during the following semester. After failing twice, the student may be denied further examination by the chairman of the department.

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 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 chairman 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, and the methods and techniques to be used. When the candidate is ready to present a prospectus, the dean of the Graduate School shall, on the recommendation of the department chairman, approve a dissertation committee with the student's dissertation director serving as chairman. According to the present Graduate School requirements, the dissertation committee with the student's dissertation director serving as chairman. According to the present Graduate School requirements, 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. A final draft must be submitted to the committee members at least two months before the date of graduation.

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 Specialization. A student enrolled in another graduate

program who wishes to declare sociology as a secondary area must submit a written request to the chairman of the departmental 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 his program in sociology to the total program.

The student will be expected to stand comprehensive examination in the area.

Applicants for admission to graduate study in sociology should apply in writing to the chairman of the department. Additional information on programs may be obtained from the departmental director of graduate studies.

Interdisciplinary Program. Students who have been admitted to the doctoral program in sociology and who wish to develop an interdisciplinary program, should review the guidelines set forth on page 20 of this catalog. 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 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 in special education and to a concentration in special education for the Doctor of Philosophy degree in education.

Master of Science in Education degree

In the master's degree program, which requires a minimum of 30 semester hours for completion, four options 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 options 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 as a part of a longer master's program planned for them by their graduate adviser. 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 Records Examination and to submit the results as a part of their application to the department.

There are four options open to those seeking a master's degree in special education: (1) resource teacher of the mildly handicapped, (2) teacher in self-contained classes for the severely handicapped, (3) coordinator of classes for the pre-school handicapped, and (4) teacher of the gifted. Program requirements for each of these options include the following courses: Sp Ed 580-3, 517-2, 500-3 and 502-2. In addition, they require completion of the courses listed below with the explanation of each of the options.

Resource teacher of the mildly handicapped. Students choosing this option will ordinarily enter the program with certification in at least one area of special education, and during the program will add 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, or to teach in self-contained classes for mildly handicapped in their areas of certification. In addition to the core courses, they must complete: Sp Ed 594-2; one

of Sp Ed 401-3, 402-3, or 404-3; 511-3; at least one of 513-3, 515-2, or 514-3; and additional electives selected in cooperation with their graduate adviser, to a total of at least 30 semester hours.

Teacher in self-contained classes for the severely handicapped. Students choosing this option will ordinarily have been certified previously in the same area, and during the master's program may or may not add another area of certification. After completion of the program they will be prepared to work as teachers in self-contained classes for severely handicapped, to work as coordinators of classes for these children, or to coordinate the development of suitable programs for them across a long span of their school experience. In addition to the core courses, they must complete: Sp Ed 594-2; 421-3; at least one of 513-3, 515-2, or 514-3; and additional electives selected in cooperation with their graduate adviser, to a total of at least 30 semester hours.

Coordinator of classes for the pre-school handicapped. Those selecting this option 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 certification 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: Sp Ed 594-2; 505-3; 511-3; and additional electives selected in cooperation with the graduate adviser to a total of at least 30 semester hours.

Teacher of the gifted. Those selecting this option will usually have completed certification requirements as an elementary or secondary teacher although not necessarily as a special education teacher. At the completion of the program, they will be prepared to work as itinerant or resource teachers for gifted children in elementary or secondary grades. In addition to the core courses, they must complete Sp Ed 594-2; and additional electives selected in cooperation with the graduate adviser to a total of at least 30 semester hours.

Research requirements for the master's program are as follows:

1. The student must successfully complete Sp Ed 500-3, and then Sp Ed 502-2 during which the research paper is completed.
2. The student must successfully defend the research paper in an oral examination conducted by the student's committee chairman and two additional committee members.

A comprehensive examination over the field of special education is also required, and is conducted by the student's committee chairman 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.

Ph.D. Program

A Doctor of Philosophy degree in education with a concentration in special education is offered. This program is based in the policies of the Graduate School and the College of Education. It is described fully in another section of this catalog under education.

Speech Communication

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, creative dramatics, interpersonal and small group communication, language behavior, oral interpretation, organizational communication and public relations, phenomenology and philosophy of communication, political communication, rhetoric and public address, semiology, and (at the doctoral level) theater. Students from the Department of Theater must take at least 12 semester credit hours of course work in the Department of Speech (see the doctoral program description in 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.

Application for admission to graduate studies in speech communication should be directed to the Graduate School. 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 do not have 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 Sheet* or *APA Style 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.

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. 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. For master's degree students the "Communication Theory and Methodology" curriculum core consists of the following course requirements:

1. Three credit hours of Speech 510, Seminar: Rhetoric and Communication.
2. Three credit hours selected from Speech 401, Communication Theories and Models, or, Speech 402, Empirical Research in Speech Communication.
3. Three credit hours selected from:
 - a. Speech 502, Seminar: Empirical Communications Research.
 - b. Speech 503, Seminar: Non-Quantitative Research Methods.
 - c. Speech 531, Seminar: Speech Education.
 - d. Speech 540, Seminar: Language Behavior
 - e. Speech 572, Critical Perspectives in Interpretation.
4. Two semesters of Speech 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.

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 of course work. 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 of Speech Com-

munication, 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. A student who completes only the minimum of 42 hours of course work may devote no more than 21 hours to course work outside the department. Such outside work 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 graduate 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. 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 course 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. Three credit hours of Speech 510, Seminar: Rhetoric and Communication.
2. Three credit hours selected from Speech 401, Communication Theories and Models, or, Speech 402, Empirical Research in Speech Communication.
3. Three credit hours selected from:
 - a. Speech 502, Seminar: Empirical Communication Research.
 - b. Speech 503, Seminar: Non-Quantitative Research Methods.
 - c. Speech 531, Seminar: Speech Education.
 - d. Speech 540, Seminar: Language Behavior.
 - e. Speech 572, Critical Perspectives in Interpretation.
4. Four semesters of Speech 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. At least six credit hours of course work that have a direct relation to research methodology that will assist the student as preparation for writing the dissertation.

Normally this last category of course work will be taken inside the department. Such course work must be selected from the courses listed in requirement two or three above, but excluding the two courses chosen to fulfill requirements two and three. If the student wishes to obtain all or part of the six hours outside the department, in order to meet requirement five, the courses selected by the student and approved by the advisory committee and the graduate committee must be in a methodology cognate to the speech communication discipline, such as: cinematics, ethnomethodology, foreign language, historiography, literary criticism, phenomenology, and statistics.

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.

Dissertation. Each student must register for at least 24 semester hours of dissertation credit in Speech 600. In addition, the student must register for at least one semester hour of credit in Speech 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 student's reliance upon faculty assistance justifies, he or she may be required by the dissertation adviser to register for an appropriately greater number of credit hours in Speech 600.

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 on page 20 of this catalog. 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.

Speech Pathology and Audiology

The Department of Speech Pathology and Audiology offers graduate work leading to the Master of Science and Doctor of Philosophy degrees in speech pathology and

audiology. The program at the master's level is designed to develop a high level of 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 specialized teachers and researchers in concentrated areas in speech pathology and audiology.

Course work at the master's level should be planned to meet the academic and professional requirements for state and national certification, which are required for professional employment, depending upon one's goal in placement. The M.S. degree program 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 and Hearing Association. ASHA certification is usually required for work in agencies, hospitals, medical centers, etc. The program in clinical training is approved and registered with the Education and Training Board of the American Board of Examiners in Speech Pathology.

Essentially, the departmental program matches the program requirements of the American Speech and Hearing Association, 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 such disorders. Thirty of the sixty hours must be in courses that are acceptable toward a graduate degree by the University in which they are taken.

Students who have not had an adequate undergraduate background in speech pathology and audiology will be required to take leveling courses as determined by the department.

GRE aptitude test scores must be submitted to the department. While they are not mandatory for admission, they should be submitted upon application, or within the first semester of residence.

A number of graduate assistantships made available by the College of Communications and Fine Arts are awarded each year to students with outstanding scholastic records. The awards 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 awards that are awarded annually by the Graduate School.

Professional experiences for graduate students are provided in the following settings: the University's clinical center; a summer residential camping program for persons with organic speech problems; the V.A. Hospital in Marion; A. L. Bowen Center for Retarded Children; nursing homes; and Anna State Hospital. Cooperative programming is maintained with other public and private agencies such as the Division of Vocational Rehabilitation, the Easter Seal Society, the National Association of Speech and Hearing Agencies, and the University of Illinois Division of Services for Crippled Children. Students participate in traveling speech 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 available in the St. Louis and Chicago areas as well as the medical school at Southern Illinois University at Carbondale and the dental school at Southern Illinois University at Edwardsville. Emphasis is on the 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 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 air and bone conduction sensitivity, localization and speech discrimination. The laboratory also has the needed equipment for studies in automatic audiometry, PGSR, middle ear impedance, and aural reflex experimentation. Another large laboratory is equipped with specialized modular television equipment for the experimental analysis of behavior and behavior modification. This laboratory also has equipment for the measurement of physiological indices of emotion, such as units for palmar sweat and electrophysiologic skin measurements. The availability of sophisticated instrumentation has made programmatic approaches to language research problems possible in the language laboratory. The department also maintains extensive materials and a laboratory for cleft palate.

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

Master's Degree

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 of the 500 level, and the completion of an approved thesis or research paper. Specific course requirements and total number of hours are determined by advisement after consultation with the graduate student. A comprehensive examination as required by the Graduate School will be given by the faculty after the student has completed two semesters of full time work.

It is recommended that students plan their programs to meet the academic and practicum requirements for the Certificate of Clinical Competence in speech pathology or audiology as designated by the American Speech and Hearing Association and for the special certificate in speech and language impaired for the Illinois State Teacher Certification Board.

A candidate for the master's degree has two options: to write a thesis or a research paper. Credit for the master's thesis may range from 3 to 5 semester hours of credit. A research paper is required of those who do not undertake a thesis. A paper should show evidence of the student's ability to formulate and present research in a form which demonstrates an acceptable level of scholarship. All students intending to pursue doctoral studies are encouraged to write a thesis. If the student plans to continue at Southern Illinois University at Carbondale, a thesis is mandatory.

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.

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

After successful completion of the approved academic program, research tool, and 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 showing capability in independent research.

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

Research Tool

- a. 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.
- b. 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 Speech Pathology and Audiology. 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.

Theater

The Department of Theater offers programs of study leading to the Master of Arts and the Master of Fine Arts degree in theater and to a concentration in theater for the Doctor of Philosophy degree in speech communications.

Graduate study in theater (at the master's level particularly) is organized more or less formally into the following areas of study: (1) acting, (2) directing, (3) design: scenic/costume, (4) playwriting, (5) history and criticism, (6) dance, (7) children's theater, Soviet and East European theater, music theater, or an approved interdisciplinary group of courses.

All students enrolled in the M.A., M.F.A., and Ph.D. degree programs will be expected to select one of these areas as their area of special interest and to demonstrate special competence in that field. Ph.D. students will also be expected to demonstrate competence in a cognate speech communication area: oral interpretation, interpersonal relations, rhetoric and public address, speech education, or language behavior.

Admission

Application for admission to graduate study in theater should be directed to Graduate School. Supporting materials for the application should be sent to the director of graduate studies in the theater department. These materials consist of (1) a personal and professional data form, and (2) three letters of recommendation from former teachers or supervisors. The official forms for these materials may be obtained from the director of graduate studies, Department of Theater. Applications and supporting materials should be submitted at least eight weeks prior to the beginning of the semester in which the student expects to begin the chosen field of study.

An undergraduate major in theater is not essential for admission to a graduate degree program in theater. A student with an undergraduate major in speech or English, for instance, may audit undergraduate courses in theater to make up any deficiencies.

Departmental processing of applications for acceptance as a graduate student in theater is the responsibility of the department's graduate adviser, who serves as adviser for all graduate students until such time as a faculty adviser or committee is named for the individual student, which is usually done not later than the middle of the first semester in residence.

Graduate students are urged to supplement their class work with practical

experiences in acting and production. Membership in the Southern Players is open to graduate students, and they may also earn graduate credit as members of the Southern Touring Company and the Summer Playhouse Company.

Master of Arts Degree

Requirements for admission imposed by the department are in addition to those of the Graduate School. The department will ordinarily accept as candidates for the master's 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 the field of theater or speech; (3) have a 2.7 (4 point scale) overall grade point average, or alternatively, a 3.0 overall for the last two years of undergraduate work; and (4) have a 4.0 overall average in theater or speech. Applicants who do not meet these minimal requirements or their equivalent, but who do meet the minimum standards of the Graduate School, can be considered for acceptance only on petition to the department's graduate adviser which, if granted, will be accompanied by a statement specifying the special conditions or requirements of admission.

A minimum of 30 semester hours of credit, no more than 6 of which may be for the thesis, constitutes the basic course requirements for the Master of Arts degree. At least 15 of these hours must be at the 500 level. The course work must be so planned as to include at least 3 hours of work in each of three of the eight areas of study.

A student who completes only the minimum of 30 hours of course work may devote no more than 5 of those hours to courses outside the department unless the work is in a cognate field which has been approved as a replacement for one of the areas of concentration within the department. In the latter event, as many as 10 hours in outside fields may be counted within the 30 hour minimum.

Each candidate for a Master of Arts degree must take the departmental course Theater 500: introduction to research methods. Candidates for the Master of Arts degree must demonstrate proficiency in a foreign language or complete a research-tool project relevant to either (1) professional skills (acting, directing, playwriting, etc.) or (2) a research area in a specialized interest.

A student must maintain an overall 3.0 (4-point scale) grade point average in order to be eligible for the Master of Arts degree.

The departmental graduate adviser is at the service of students by registering them in courses, helping them plan their program, and conferring with the students in the selection of the chairman and members of a thesis committee. The topic of the thesis, which is required, is chosen in consultation with committee chairman at the earliest practical time.

The final oral examination will cover the thesis and the major area in which it was written, and it may also test the candidate's general competence in the field of theater.

The Master of Fine Arts

While the department's requirements for admission to graduate-degree programs coincide with those of the Graduate School, a student who wishes to earn the M.F.A. degree must follow a program procedure in order to qualify for admission to this degree program.

Students must take 11-12 hours of core courses in the department: a directing course (Theater 402 a or b); seminar in theater arts, aesthetics (Theater 526); contemporary developments in the theater (Theater 438); one course in the concentration with directing students taking a course in acting; and a qualifying project consisting of a piece of creative work which may be registered for under 1 hour of independent study (Theater 530). If a student has taken equivalent content elsewhere, other courses suggested by the graduate adviser or the advisory committee may be substituted.

Successful completion of these courses with a grade of *B* or better will not in itself assure the student of candidacy for the M.F.A. degree; the student must also satisfy the faculty as being artistically qualified for admission to the program by demonstrating above-average talent in one of three areas: (1) acting-directing, (2) design: scenic/costume, and (3) playwriting. Artistic qualification may be determined after demonstrated ability is shown by a portfolio of designs, for example, or by directing, or designing a laboratory production, or by submitting play manuscript(s). Each potential candidate will also be interviewed by a faculty committee or jury. The judgment of the faculty committee in the evaluation of artistic qualifications will be final.

Once admitted as a candidate for the M.F.A. a student will complete 48 hours of courses (including 6 for the thesis) and a creative project in the area of concentration under the guidance of his adviser.

It is assumed that the majority of students applying for admission to the M.F.A. program are graduates of institutions other than SIU. All such transfer students must give evidence of having completed elsewhere practical training of thoroughness and quality which is the equivalent of the undergraduate work offered in theater at SIU at Carbondale. Transfer students who hold an M.A. or M.S. in theater from another institution will not, under any circumstances, be accepted for the M.F.A. until they have successfully fulfilled the requirements and thus given evidence at Southern Illinois University at Carbondale of their qualifications.

Doctor of Philosophy Degree

Prospective doctoral students should carefully study the program description in speech communication.

For the degree of Doctor of Philosophy, theater students are required (1) to complete a minimum of 37 hours of course work exclusive of the research tool, and (2) to complete a dissertation in theater. A minimum of 23 of these hours are taken in theater and the remainder comprise a cognate composed of courses from related areas of competence, 11 from speech, and the rest may be from courses outside the Departments of Speech communication and Theater.

Students in the Doctor of Philosophy program who have a special interest in dramatic literature may, upon the approval of their advisory committee, earn the degree by substituting for theater courses a limited number of courses in dramatic literature as offered in the Department of English. A similar specialization may be built from courses in radio-TV, cinema, fine arts, etc., upon advisory approval.

Qualified students may offer a creative equivalent in producing, playwriting, or design, under the supervision of an advisory committee. For the Doctor of Philosophy degree with a concentration in theater a student must demonstrate competence in one research tool (refer to speech communication for description) relevant to skills needed for understanding materials in the field, or in the conduct of research for the dissertation, or in continuing research contributions in the field of concentration. Students must also satisfy the graduate staff that they are qualified for candidacy by passing a comprehensive preliminary examination. Graduate courses in theater may also be taken as a secondary concentration leading to the Doctor of Philosophy degree with a concentration in one of the areas of competence in speech communication.

Vocational Education Studies

The Department of Vocational Education Studies offers three programs (business education, home economics education, and occupational education) and cooperates with the Department of Agricultural Industries 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) 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 the secretarial subjects, teaching distributive education, teaching consumer education, principles and problems of business education, research in vocational, occupational and career education, and organization and administration of cooperative vocational business education. A minimum of two of the following courses is required: VES 561, VES 566, VES 511, VES 512. 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. Eight 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 April and July. Broad, essay-type questions are asked that require the student to apply the knowledge acquired in solving realistic problems. Each student selects four of the following areas to be included in the

examination, writing on each area from forty to sixty minutes: (1) teaching typewriting, (2) teaching shorthand and transcription, (3) teaching bookkeeping and accounting, (4) teaching office practice and machines, (5) teaching general or basic business and consumer education, (6) teaching distributive education, (7) teaching data processing, (8) vocational business education, (9) office management, (10) records administration, (11) principles and problems of business education, (12) research in business education, (13) tests and measurements in business education, (14) administration and supervision of business education.

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.

HOME ECONOMICS EDUCATION

Graduate programs in home economics education in the Department of Vocational Educational Studies are designed to prepare persons to qualify for the following types of positions:

- a. High school teaching, including supervision of student teachers in home economics.
- b. Teacher education in colleges and universities.
- c. City, state, or similar supervisory positions.
- d. Directing or teaching of adult programs of home economics.
- e. Teaching or coordinating occupational education programs.
- f. Junior college teaching.

These programs also meet the needs of those who desire to go into teacher training, state supervision, vocational education, or cooperative extension work. All students are encouraged to supplement their courses in home economics education with preparation in related areas and general professional education.

In addition, a student enrolled in a program leading to the Ph.D. degree in education with a concentration in secondary education, higher education or occupational education may select the elective portion of the program from graduate courses offered in the program of home economics education in the Department of Vocational Education Studies.

Program Requirements for Admission

- a. Admission to the Graduate School.
- b. A bachelor's degree from an accredited college, with a major or its equivalent in home economics education. Under certain circumstances a student without sufficient background in home economics education and education may be admitted with the approval of the adviser and allowed to make up undergraduate deficiencies concurrently with graduate study. Courses taken to correct undergraduate deficiencies will not apply to minimum requirements for the degree.

Program Requirements for the Degree

- a. The Master of Science in Education degree in home economics education requires a minimum of 30 semester hours of graduate credit. Twenty to twenty-two hours in home economics education and vocational education studies courses are required for all students. The additional hours required will be selected in terms of the candidate's vocational objectives from one or more related fields such as: education, anthropology, art, psychology, and sociology.

- b. Required courses for all students in the home economics education program are: Guidance 502, introduction to statistical methods; Vocational Education Studies 561, methods of research, or equivalent.
- c. All students are expected to evidence competency in the areas of curriculum, methodology, evaluation, and philosophy. High school teachers wishing to qualify as supervising teachers in student teaching centers should include VES 522 in their programs.
- d. Students preparing for positions listed in B and C above will include VES 522 and when possible 597, the practicum in supervision. Such students will, in addition to the home economics education requirements, include a minimum of 6 hours of related work from the field of education.
- e. Students preparing for work in occupational education programs include VES 466, principles and philosophy of vocational-technical education; VES 525, vocational cooperative education; a work experience practicum; and other courses as needed to provide sufficient skill background. Two thousand hours of work experience in home economics related occupations are required for full approval for vocational coordinator positions.
- f. Students preparing for junior college teaching should take HIEd 526, the community junior college; VES 466, principles and philosophy of vocational-technical education; and subject matter courses in two or more areas of home economics. An internship program is available for qualified students.

OCCUPATIONAL EDUCATION

Programs leading to the Master of Science in Education degree and the Master of Science degree in occupational education and to a concentration in occupational education for the Doctor of Philosophy degree in 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.

Student 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.

Master of Science in Education Degree

The Department of Vocational Education Studies offers the Master of Science in Education degree in occupational education for the development of competencies in one of the occupational or vocational-technical concentrations. This degree requires a minimum of 30 hours, including 2-6 hours of research paper.

Requirements: Other requirements include:

1. Completion of a minimum of 16 hours in occupational education and vocational education studies with the following courses required: VES 466-3, VES 561-3, VES 562-3, and VES 574-3.

2. An individually designed program of studies approved by the student's advisory committee before completion of 8 hours of the credit applied to this degree.
3. A research paper which meets guidelines of the Graduate School and has the approval of the student's graduate adviser.
4. Copy of draft research paper must be submitted to the student's adviser 6 weeks before graduation.

Master of Science Degree

This degree specialization is offered to the student who desires to develop research oriented competencies in the study of occupational education such as the construction and testing of teacher-learning equipment, physical measurement problems, curriculum development, and evaluation. Each candidate for the Master of Science degree is required to complete 32 hours of graduate credit and to submit an approved thesis.

Requirements: Other requirements include:

1. Complete a minimum of 20 hours in vocational education studies and occupational education. Required courses are: VES 466-3, VES 561-3, VES 562-3, VES 574-3, and 2-6 hours of VES 599.
2. An individually designed program of studies approved by the student's advisory committee before completion of 8 hours of the credit applied to this degree.
3. Required research competency such as statistics, computer programming or other research methodology as approved by the student's advisory committee.
4. Nine to 12 hours in a concentration selected to strengthen the student's expertise in the thesis topic area. Selection of courses must be approved in advance by the student's advisory committee.
5. Advisory committee approval of thesis topic and proposal no less than 4 months in advance of graduation.
6. Copies of draft thesis must be submitted to the student's advisory committee 6 weeks before graduation.

Zoology

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 (exceptional individuals may be admitted following the bachelor's degree.); have a grade point average in graduate work of 3.25 (where A = 4.0) or above.

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 chairman.

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 chairman.

A program of course work and 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 593 (when 593 is used as part of the M.S. requirement), 599 or 600 no later than the end of the second semester of registration in the program. The doctoral student should file a research plan no later than the end of the second semester in the program.

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 288b 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 593. 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.

A passing performance on a written examination covering the general concepts of zoology is required no later than the end of the second semester of registration in the program. With approval of the student's committee, the examination may be repeated one time, but this must be done before the end of the third semester in the program. There will be a periodic review of all graduate students; and to continue in the program, all retention requirements listed above must be accommodated.

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 three 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 application for graduation.

The Ph.D. Degree

No minimal number of credit hours is required for the degree. 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 288b 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: 302, 311F 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; a minimum grade point average of 3.00 (*B*) is required for all course work. 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 of formal course work are completed, usually at the end of the second year of graduate study. The student after consulta-

tion with the adviser and the director of graduate studies in zoology registers with the chairman of the preliminary examination committee to take the examination. The written examination covers the general principles and concepts 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, reviewed for approval by the chairman and forwarded 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. Following the seminar, a 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 application for graduation.

3

Course Descriptions

In this chapter all 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.

Administration of Justice	Engineering Biophysics	Mining Engineering
Agricultural Industries	Engineering Technology	Molecular Science
Agriculture	English	Music
Animal Industries	Foreign Languages and Literatures	Philosophy
Anthropology	Chinese	Physical Education
Art	Classical Studies	Physics and Astronomy
Biology	French	Physiology
Botany	German	Plant and Soil Science
Business Administration	Greek	Political Science
Accountancy	Japanese	Psychology
Administrative Sciences	Latin	Public Visual Communications
Finance	Russian	Radio-Television Recreation
Marketing	Spanish	Rehabilitation
Chemistry and Biochemistry	Forestry	Religious Studies
Cinema and Photography	Geography	Science
Communications and Fine Arts	Geology	Social and Community Services, Division of
Comprehensive Planning and Design, Division of	Guidance and Educational Psychology	Black American Studies
Clothing and Textiles Design	Health Education	Community Development
Interior Design	Higher Education	Social Welfare
Computer Science	History	Sociology
Curriculum, Instruction, and Media	Human Development, Division of	Special Education
Economics	Child and Family	Speech Communication
Education	Family Economics and Management	Speech Pathology and Audiology
Educational Leadership	Food and Nutrition	Theater
Engineering	Human Resources	Vocational Education Studies
Electrical Sciences and Systems Engineering	Industrial Technology	Business Education
Engineering Mechanics and Materials	Journalism	Home Economics Education
Thermal and Environmental Engineering	Linguistics	Occupational Education
	Mathematics	Zoology
	Medical Education Preparation	
	Microbiology	

The first entry for each course is a three-digit identification numeral. Courses numbered 400-499 are open to both seniors and graduate students, unless designated otherwise. Courses numbered above 499 are for graduate students only.

Following the course identification number is another number which indicates

maximum credit allowed for the course. The maximum may vary, and specific semester hours may be assigned for each term a course is offered.

Following the course 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. They may not register for 400-level courses in which Pass-Fail grading is mandatory and may not receive a grade of *Pass* or *Fail* in 400-level courses graded Pass/Fail on an elective basis. Graduate credit is awarded for 500-level courses which have been approved to be graded *S/U* (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, published three times a year by University Graphics, Southern Illinois University at Carbondale, Illinois 62901.

Administration of Justice

The following courses are offered through the Center for the Study of Crime, Delinquency, and Corrections.

406-3 Legal Aspects in the Administration of Justice. Substantive jurisprudence in the criminal law, including historical and analytical; substantive law relating to police, courts, and corrections including factors affecting decision making. Prerequisite: 305, or graduate status, or consent of instructor.

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: 200 and 201 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: 200 and 201 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: 200 and 201 and 416 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: 200 and 201 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: 200 and 201 or consent of instructor.

473-4 Juvenile Delinquency. (See Sociology 473.) Prerequisite: 200 and 201 or consent of instructor.

485-3 Corrections and the Community. Traditional correctional functions are redefined to emphasize development of resources of community at large, diversion of convicted offenders from institutions, and direct involvement of correctional programs in community affairs. Prerequisite: 200 and 201 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: 200 and 201 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: 200 and 201 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.

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.

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

578-1 to 4 Seminar in Correctional Rehabilitation Counseling. Review of major issues and research relative to rehabilitation practices in youth and correctional settings. Prerequisite: consent of instructor.

580-3 Planning for Change in the Administration of Justice. A simulated planning and design experience with real justice system problems is offered. Each student is required to individually investigate a criminal justice sub-system, study the literature and theoretical 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.

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.

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. 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. Graded on a letter grade basis. Prerequisite: consent of instructor.

599-3 to 6 Thesis. Graded *S/U* only. Prerequisite: consent of academic coordinator.

Agricultural Industries

Field trips are required for certain courses. The School of Agriculture offers courses in agricultural industries as part of a residence-center program at Western Illinois University.

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. Elective Pass/Fail.

402-1 to 18 (1 to 6 per topic) Problems in Agricultural Industries. (a) Agriculture Economics. (b) Agriculture Education. (c) Agriculture Mechanization. Designed to improve the techniques of agriculture industries 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 chairman.

411-3 Program Development in Agricultural Extension. Principles and procedures in developing extension programs with emphasis on program determination and methods. Prerequisite: junior standing.

412-2 Principles of Agriculture Mechanization. Theory and use of educational materials and devices adaptable to the needs and interests of educators involved in agricultural mechanization laboratories.

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.

440-3 Land Resource Economics. (Same as Economics 471.) The use of land as an economic variable in production of goods and services; land markets; group versus individual conflicts; and land utilization as related to institutional arrangements. Prerequisite: 204, GSB 211 or consent of instructor. Elective Pass/Fail.

442-2 Agricultural Development in Emerging Countries. Principles and practices in improving agriculture in areas with limited capital and low levels of technology. Prerequisite: 204 or GSB 211. Elective Pass/Fail.

443-2 Marketing Practices and Problems in Developing Countries. Types of markets, assembly of products, storage, transportation, quality determination, and pricing practices which are peculiar to the developing countries. Market organization and practices for the major export products and the principal domestic foods and fibers in such countries. Various methods of progressively improving such markets. Prerequisite: 204 or equivalent. Elective Pass/Fail.

450-3 Advanced Farm Management. The role of the farm manager in credit institutions, professional farm management service and the self-employed farmer will be emphasized. The concepts of farm marketing, farm finance and decision making as integrated in the management process will be central. Field trips not to exceed \$25. Prerequisite: 350 or equivalent. Elective Pass/Fail.

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. Elective Pass/Fail.

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. Elective Pass/Fail.

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: 360.

462A-1 Agricultural Marketing Problems and Practices — Livestock. Problems and their solutions in marketing livestock. Prerequisite: 362. Elective Pass/Fail.

462B-1 Agricultural Marketing Problems and Practices — Field Crops. Problems and their solutions in marketing field crops. Prerequisite: 362. Elective Pass/Fail.

462C-1 Agricultural Marketing Problems and Practices — Dairy and Poultry. Problems and their solutions in marketing dairy and poultry products. Prerequisite: 362. Elective Pass/Fail.

462D-1 Agricultural Marketing Problems and Practices — Horticultural Crops. Problems and their solutions in marketing horticultural crops. Field trips cost \$5.00. Prerequisite: 362. Elective Pass/Fail.

463-2 Commodity Futures Market. The mechanics of futures market trading, commodity charting, technical and fundamental trading approaches, hedging and risks in commodity speculation will be emphasized. The history, development, and importance of the commodity future market will be reviewed and the role of participants and supporting institutions will be presented. Prerequisite: junior or senior standing. Elective Pass/Fail.

472-3 Agricultural Tractors and Engines. The principles of operation, selection, mechanics, maintenance, tune-up and testing of multi-cylinder farm type internal combustion engines. Prerequisite: 379 or equivalent, or concurrent enrollment or consent of instructor.

473-2 Advanced Agricultural Electricity. Application of electricity to agricultural problems. An emphasis on principles of electrical distribution on the farm and the agribusiness operation. Planning the efficient usage of electrical machinery and a study of components parts to increase productivity and save labor. Prerequisite: 379 or equivalent.

474-2 Advanced Agricultural Structures. A discussion and study of design characteristics applicable to farm structures. Consideration of economics, costs, environment, arrangements, materials and type of structures. Plans and drawing of farmstead layout, service buildings, and rural residential buildings will be made. Prerequisite: 378 or equivalent.

475-3 Agricultural Materials Handling, Processing, and Storage. Arrangement of systems for animal waste disposal, feed handling, and processing, and storage of agricultural products. Prerequisite: 378 or 379 or 473 or 474.

500-4 (2, 2) Agricultural Industries Research Methodology. (a) Social science research

methodology in agriculture including defining research problems, preparing project proposals, and sources of data. (b) A survey of techniques and procedures for developing and evaluating agricultural economic research models.

551-3 Resource Allocation in the Agri-Business Firm. An examination of resource allocation in the agri-business firm. Production decisions, agricultural product price analysis, and decision making models are considered. Prerequisite: six hours of agricultural economics or economics or consent of instructor.

552-3 Problems and Policies of the Agricultural Sector. An analytical survey of agricultural policy issues including agricultural price and income stabilization; international trade, capital and credit, the structure of agriculture and the quality of life in rural areas. Prerequisite: six hours of agricultural economics or economics or consent of instructor.

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: 471 or 472 or equivalent.

581-1 to 12 (1 to 4 per topic) Seminar. (a) Agriculture Economics. (b) Agriculture Education. (c) 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.

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.

Animal Industries

Field trips are required for certain courses. The School of Agriculture offers courses in animal industries as part of a residence-center program at Western Illinois University.

414-2 Animal Feed Quality Control. Laboratory procedures for nutrient determinations used in animal feed quality control. Prerequisite: course in chemistry recommended.

415-3 Monogastric Nutrition. Advanced principles and practices involved in meeting nutrient requirements of monogastric animals. Prerequisite: 215 and 315 recommended.

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 recommended.

419-3 Stable Management and Horsemanship. Laboratory experience in routines of horse care, training, and management. Field trips. Additional costs \$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. 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. Elective Pass/Fail.

- 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 population; interpretations of gene frequency, heritability, and genetic correlations; application of selection and breeding systems in farm animals. Prerequisite: 332. Elective Pass/Fail.
- 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. 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: consent of instructor.
- 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: consent of instructor.
- 531-2 Livestock Management for Reproductive Efficiency.** An advanced course in livestock reproduction and its application to management problems. Current research in reproductive physiology applicable to the management of farm herds and flocks will be discussed. 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.

Anthropology

400A-3 Current Problems in Physical Anthropology. The collection, analysis and interpretation of data on human populations. Problems in the study of human populations, including inbreeding, natural selection, fertility, drift and migration. Prerequisite: 300A for undergraduates or consent of instructor.

400B-3 Current Problems in Linguistic Anthropology. Presentation and discussion of

ongoing development in theory and methodology in linguistic anthropology. Prerequisite: 300B for undergraduates or consent of instructor.

400C-3 Current Problems in Archaeology. Detailed consideration of various aspects of current directions in archaeological method and theory. Prerequisite: 300C for undergraduates or consent of instructor.

400D-3 Current Problems in Social-Cultural Anthropology. A survey of current problems in the description and analysis of non-Western social systems. Prerequisite: 300D for undergraduates or consent of instructor.

401-3 Language and Culture. Linguistics and the study of culture in relation to animal communication, language acquisition, linguistic typology and universals, ethnosemantics and sociolinguistics. Prerequisite: 300B for undergraduates or consent of instructor.

402-3 Man and Culture. Offered primarily for non-anthropology majors. Focuses on the nature of culture and cultural processes with emphasis on the relationship of cultural behavior to man as an individual and as a group.

404-3 Technology and Anthropology. An introduction to the basic ways in which Man utilizes the natural resources of his habitat to meet his various needs, such as food, shelter and transportation. Consideration will be given to the types of materials used and the tools and appliances manufactured by non-Western peoples to meet their needs.

405-3 Art and Anthropology. The nature of art, its locus in culture, its integration in society as exemplified in world cultures.

406-3 Conservation Archaeology. The method and theory of archaeology in relationship to local, state, and federal laws regarding the protection and excavation of antiquities. Emphasis is on problem-oriented survey and excavation, as well as the preparation of archaeological contracts and the writings of reports to satisfy statutes involving environmental concerns. Prerequisite: 300C or 400C or consent of instructor.

409-3 History of Anthropology. The development of anthropological thought from the Age of Discovery to the present. The emphasis will be on the intellectual and social milieu which fostered general and specific conceptual views and methods. Considered are developments in the several major subfields of anthropology including archaeology, anthropological linguistics, human biology, and cultural anthropology. Required for all anthropology graduate students. Prerequisite: None. 300D recommended for undergraduates; 400D or equivalent recommended for graduate students.

410A-3 Applied Anthropology. The practical applications of theoretical social anthropology. Problems of directed culture change are examined from an anthropological perspective as they apply to the work of the educator, social worker, extension agent, administrator and others who are attempting to guide change in the life ways of others in Western culture and the third world. Prerequisite: none. 300D recommended for undergraduates.

410B-3 Educational Anthropology. An examination of the cultural processes of formal and informal education, the use of anthropological premises in educational program design, bicultural-bilingual education programs, comparative American/non-American systems, and the teaching of anthropology. Prerequisite: none. 300D recommended for undergraduates.

410C-3 Economic Anthropology. The study of non-Western economic systems. Prerequisite: none. 300D recommended for undergraduates.

410D-3 Anthropology of Folklore. A comparative study of the role of folklore in various cultures of the world, with emphasis upon nonliterate societies. Analysis of motifs, tale-types, themes and other elements; comparisons between nonliterate and literate groups. Prerequisite: none. 300D recommended for undergraduates.

410E-3 Anthropology of Law. Anthropological thought on imperative norms, morality, social control, conflict resolution and justice in the context of particular societies, pre-literate 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.

420-3 to 9 Advanced Studies in Languages of the World. Attention given to language

families, focusing on studies of linguistic history, genetic relationships, and typological classification. Any one semester will concentrate on language of a major geographical area. Prerequisite: 300B or 400B or consent of instructor.

425-3 Cognitive Anthropology. The theory of culture as cognitive organization is explored. Among the topics are: formal analysis of lexical domains, folk classifications and strategies, the problem of psychological validity, linguistic determinism and relativity, biogenetic and psycholinguistic bases of cognition, and the "new ethnography".

430A-3 Archaeology of North America. Detailed study of the early cultures of North America. Emphasis on the evolutionary cultural development of North America. Prerequisite: 300C or 400C or consent of instructor.

430B-3 Archaeology of Meso-America. Detailed study of the early cultures of Meso-America with emphasis on the evolutionary cultural development of Meso-America. Prerequisite: 300C or 400C or consent of instructor.

430C-3 Archaeology of the Southwest. Detailed study of the early cultures of the Southwest with emphasis on the evolutionary cultural development of the area. Prerequisite: 300C or 400C or consent of instructor.

430D-3 Archaeology of the Old World. Detailed study of the early cultures of the Old World with emphasis on the evolutionary cultural development of the area. Prerequisite: 300C or 400C or consent of instructor.

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.

441-3 Laboratory Analysis in Archaeology. Methods of analysis of archaeological data in a laboratory setting.

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).

460-1 to 12 (1 to 3 per semester) 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.

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

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. Elective Pass/Fail.

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) Seminars 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.

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.

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.

570-2 to 6 (2 to 3 per topic) Seminar in Art and Technology. 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.

571-2 to 6 (2 to 3 per topic) Visual Anthropology. The anthropology of visual communication.

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.

595-4 (2, 2) Field Methods in Ethnology. (a) Stresses field methods in ethnology, including 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. (b) Stresses the linguistic context of culture, its appropriate recording, and structural study.

596-4 (2, 2) Field Methods in Archaeology. (a) Includes anthropological methods of inquiry and documentation of culture and habitat, together with appropriate instruction in the techniques of field work. (b) Stresses the practical application of archaeological methods and techniques to field work.

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.

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.

400-2 to 16 Drawing I. 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:

- Undergraduates-300-8. Graduates-consent of major adviser in appropriate art discipline.
- 401-2 to 16 Painting I.** 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: Undergraduates-301-8. Graduates-consent of major adviser in appropriate art discipline.
- 402-2 to 16 Printmaking I.** 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: Undergraduates-302-8. Graduates-consent of major adviser in appropriate art discipline.
- 403-2 to 16 Sculpture I.** 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: Undergraduates-303-8. Graduates-consent of major adviser in appropriate art discipline.
- 404-2 to 16 Ceramics I.** 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: Undergraduates-304-8. Graduates-consent of major adviser in appropriate art discipline.
- 405-2 to 16 Metalsmithing I.** 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: Undergraduates-305-8. Graduates-consent of major adviser in appropriate art discipline.
- 406-2 to 16 Fibers/Weaving I.** Art studio course directed toward helping the student develop a sense of visual organization through individual research in fibers/weaving while gaining skill and facility in the use of these materials and their use in the student's creative expression. Prerequisite: undergraduates, 306-8; graduates, consent of major adviser in appropriate art discipline.
- 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.
- 414-2 to 16 Glassblowing I.** 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: Undergraduates-consent of instructor.
- 418-2 to 9 (2 to 3, 2 to 3, 2 to 3) Individual Teaching Methods.** Each student demonstrates an understanding of individual teacher-directed self-evaluative teaching methods involving studio projects, teacher-student evaluative sessions, individual projects, lecture-discussions and a term paper. Incidental fee \$20.00 maximum.
- 419-3 17th and 18th Century Art.** Painting, sculpture, and architecture in Europe from the Baroque period to the French revolution.
- 427-3 Art Since 1945.** Painting, sculpture, and architecture since World War II. Main emphasis is on the shift of artistic innovation from western Europe to the United States.
- 428-3 Individual Problems in Art Education for Elementary Education Majors.** Individual concentration on one studio discipline and its application to preschool, elementary education, early childhood and special education. Incidental expenses will be at least \$20.00. Prerequisite: 348a.
- 429-3 20th Century Art to World War II.** Painting, sculpture, and architecture in Europe from the turn of the century to 1945.
- 439-3 American Art to World War II.** Painting, sculpture, and architecture in the United States from the Colonial period to 1945.
- 447-3 Introduction to Museology.** A survey of museum and gallery techniques 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 his/her own studio. Prerequisite: art major or consent of instructor.
- 449-3 Renaissance Art.** Painting, sculpture, and architecture in Italy and Northern Europe during the Renaissance period and its culmination in 16th Century Mannerist Art.
- 457-3 Women in the Visual Arts.** Consists of lecture, discussion, and research in the following areas: women artists in history and the contemporary art world, the image and symbolism of the female form, women as art patrons, and women in photography, film, crafts, and architecture. Screening fee will be \$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 Art of the Thirties.** A study of American art (painting, sculpture, mural art, crafts, etc.) during the Great Depression. Special emphasis will be placed on the origins of governmental patronage of the arts; its success and failure.
- 499-2 to 16 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 student's individual needs in problem research. Can be used for interdisciplinary program flexibility. Prerequisite: consent of instructor.

500-2 to 16 Drawing 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.

501-2 to 16 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.

502-2 to 16 Printmaking 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.

503-2 to 16 Sculpture 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.

504-2 to 16 Ceramics 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.

505-2 to 16 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. Prerequisite: consent of instructor.

506-2 to 16 Fibers/Weaving II. Art studio course directed toward developing the student's sense of visual organization and imagery by intensive, individual research in fibers/weaving or that aspect that he has chosen to explore. Prerequisite: consent of instructor.

507-3 to 6 (3, 3) Readings in Art History. Individual assistance and investigation to discover new meaning and involvement in graduate studio work through the literature of art.

508-2 to 9 (2 to 3, 2 to 3, 2 to 3) Research in Art Education. Each student demonstrates via class presentations, a term paper, surveys of research reports and formulations of research designs, an understanding of advanced art education research procedures, analyses and implications; new process and product research techniques; and research in artistic creativity, perception and the evolution of art images. Prerequisite: consent of instructor.

514-2 to 16 Glassblowing 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 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.

Biology

There is no graduate program in biology (see Chapter 2 for biological sciences).

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.
- 411-4 Morphology of Ferns and Fern Allies.** The study of external form, internal structure, and relationships of ferns and fern allies, living and extinct. Two lectures and two laboratories per week. Prerequisite: 204.
- 412-4 Morphology of Seed Plants.** The study of external form, internal structure, and relationships of gymnosperms and angiosperms, living and extinct. Two lectures and two laboratories per week. Prerequisite: 204.
- 414-1 to 2 Paleobotany.** (Same as Geology 414.) The development of skills in paleobotany through the pursuances of specific laboratory or library research problems. Prerequisite: 400 or consent of instructor.
- 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.
- 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.** Distribution of forests and shrublands of the world in relation to climate and soil with emphasis on forest types of North America and of the Midwest. Autecology, physiological ecology, and genetics of major forest species. Two lectures per week with Saturday field trips and exercises. Prerequisite: Biology 307 or equivalent, or consent of instructor.
- 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 (\$5.) 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: \$80.00. 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.
- 456-4 Introductory Pathology.** A study of plant diseases caused by fungi, bacteria, and viruses. Special attention given diseases of southern Illinois plants. Laboratory and field trips.
- 457-3 Forest Pathology.** A study of the nature and control of tree diseases in forests, parks, streets, and nurseries. Fungal diseases are stressed.
- 460-3 Application of Statistical Techniques in Botanical Research.** Techniques of data handling and graphical representation, use of statistical tests, design of experiments and interpretation of results, and preparation of scientific papers. Students will choose individualized projects in the greenhouse, laboratory, field, computing center, or library. Two lectures per week plus conferences on projects. Prerequisite: ten hours in botany or equivalent.

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.)

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 chairman.

503-10 (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.

524-2 Advanced Plant Genetics. A consideration of incompatibility systems, paramutation, cytoplasmic inheritance, developmental genetics, and other genetic topics as they occur in higher plants. Prerequisite: Biology 305 or equivalent.

525-3 Cytology. (Same as Zoology 525.) An analysis of the subcellular and cytochemical organization of the cell. Structural-functional aspects of organelles, membranes, and other cellular 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.

526-4 Cytogenetics. A study of structure, transmission, and mutation of nuclear and cytoplasmic genetic elements, with emphasis on the utilization of structural changes in chromosomes and of changes in chromosome number in theoretical and applied genetics. Two lectures and two laboratories per week. Prerequisite: Biology 305 and 306, or equivalent.

532-3 Embryogenesis and Organography of Plants. A study of the developmental anatomy and comparative morphology of embryophytes, with emphasis on analysis of homologous versus analogous structure. In particular, the following aspects of organ development will be considered: embryological origin, cellular pattern of formation, cytochemical and histological characterization, and diversification in form. Laboratory will allow students to observe the organographic features discussed. Prerequisite: 320, 400, or consent of instructor.

533-4 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. Analysis of growth and effects of these regulators will be the subject of the individualized laboratory study on a plant of the student's choice. Prerequisite: 320 or consent of instructor.

535-2 Energetics of Aquatic Ecosystems. Energy flows in aquatic habitats; photosynthesis and respiration rate determinations under natural and laboratory conditions; determination 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, cytotaxonomy, 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 GSA 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 GSA 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.

580-1 to 6 (1 per semester) Seminar. One hour discussion of current topics in biology. Every semester. Graded *S/U* only.

581-1 Ecology Seminar. Student discussions and presentations concerning various classical, contemporary, and controversial ecological topics. Prerequisite: consent of instructor.

582-1 Bryology Seminar. Student and faculty discussions and presentations concerning various classical, contemporary, and controversial topics in bryology, including systematics, morphogenesis, ecology, genetics, and natural history of all major families and key genera. Prerequisite: consent of instructor.

583-1 to 4 (1 per semester) Mycology Seminar. Student and faculty discussions and presentations concerning various classical, contemporary, and controversial topics in mycology. Prerequisite: consent of instructor.

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

590-1 to 3 Introduction to Research. Methods of presentation of research materials, including bibliographies. Taxonomy students learn to write keys and descriptions; botanical Latin, nomenclature. Every semester. Prerequisite: consent of instructor.

591-2 to 9 Research. Assignments involving research and individual problems. Master's students may use this for their research for their thesis. Every semester. Prerequisite: consent of instructor.

599-2 to 9 Thesis. Course to be taken in the preparation of the master's thesis. Every semester. Prerequisite: consent of instructor.

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.

Business Administration

Students desiring to enroll in these courses must be admitted to the MBA program or have permission of the associate dean for graduate study in business administration.

410-3 Accounting Concepts. Interpretation and critical analysis of reports, statements, and other accounting data from the viewpoint of users of financial information. Restricted to MBA students. Prerequisite: enrollment in MBA program or consent of instructor.

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 instructor.

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 instructor.

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 instructor.

451-5 Methods of Quantitative Analysis. (See Mathematics 457.)

500-3 Research Applications in Business and Organizations. The analysis of actual problems in research: project design, data collection, analysis, interpretation, dissemination, and application in business and organizational settings. This includes an understanding of the proper utilization of appropriate research statistics and involves use of the computer for problem solving. Three lecture and two laboratory hours per week. Prerequisite: enrollment in MBA program or consent of instructor.

501-3 Operations Research I. A survey of quantitative approaches to business problems with specific emphasis on problem formulation, model building, and model solution. Topics include linear programming, transportation models, dynamic programming, inventory theory. Prerequisite: enrollment in MBA program or consent of instructor.

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 instructor.

510-3 Managerial Accounting and Control. Emphasizes the uses of accounting information by management for planning, control, and decision making and its behavioral impact. Includes study of job order and process cost systems. Prerequisite: enrollment in MBA program or consent of instructor.

511-3 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 governmental agencies. Prerequisite: enrollment in MBA program or consent of instructor.

512-3 Auditing Concepts and Methods. Development of auditing theory and its implications for auditing practice; emphasis on auditing standards concepts; pronouncements and bulletins of the American Institute of Certified Public Accountants, and current literature. Prerequisite: enrollment in MBA program or consent of instructor.

514-3 Controllorship. Function of controllorship in a business organization; analysis of the duties and responsibilities of a controllor; contribution of a controllor to effective planning, coordination, and control through accounting, case studies. Prerequisite: enrollment in MBA program or consent of instructor.

515-3 Accounting Informations Systems. Basic concepts underlying information systems design and operation for integrated business operations. Concepts are developed within

the framework of economic information requirements, business organization theories, decision models and information flow criteria. Survey of accounting, marketing, and production subsystems, planning and budgeting systems, and computer-based systems. Prerequisite: enrollment in MBA program or consent of instructor.

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

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 instructor.

526-3 Managerial Economics. Develops conceptual framework for business decision making with emphasis on demand, costs, prices, and profits. Prerequisite: enrollment in MBA program or consent of instructor.

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 instructor.

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 instructor.

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 instructor.

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 instructor.

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

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 instructor.

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 salesman problems, probabilistic programming, queuing, simulation and inventory theory. Prerequisite: 501; enrollment in MBA program or consent of instructor.

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 instructor.

544-3 Production-Operations Management. A graduate level survey of the design operation and control of systems or processes by which materials, labor, and capital are combined in an organized way with the objective of producing goods or services. Techniques mastered in 501 and 541 will be heavily relied upon such as linear and dynamic programming, network analysis, and queuing theory. Topical coverage includes the systems concept, planning, forecasting, job design, location, layout, logistics, scheduling and production, inventory, quality, labor and cost control. Prerequisite: 501 or equivalent.

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 instructor.

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 instructor.

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 instructor.

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 instructor.

555-3 Consumer Behavior. Emphasis on theories and experimental techniques drawn from the behavioral sciences. Prerequisite: enrollment in MBA program or consent of instructor.

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 instructor.

580-3 International Business Operations. Course is designed to provide an overview of the international dimension of a firm's operations. Alternative methods for reaching foreign markets, operational adjustments and specific problems in dealing with foreign environments, are the principal areas of consideration. Prerequisite: enrollment in MBA program or consent of instructor.

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

598-3 Business Policies. Study of the development and evaluation of business strategies and policies as they relate to the overall performance of the firm within its environment. Knowledge of the functional areas of administration, available business data, and analytical tools will be utilized in solving comprehensive business cases and simulation games. Prerequisite: enrollment in MBA program or consent of instructor.

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

Accountancy

There is no graduate program offered through the Department of Accountancy. Four-hundred-level courses in this department may be taken for graduate credit unless otherwise indicated in the course description.

405-3 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: 222.

419-3 Accounting Information Systems. Accounting systems design and installation. The study of accounting information systems, including computer-oriented systems, with emphasis on the information and control functions of the management decision-making process. Prerequisite: 322, 341, Computer Science 212.

432-3 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: 365.

442-3 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: 341.

453-3 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.

475-3 Budgeting and Systems. A study of the application of mathematics, statistics, and the computer to specific budgetary and accounting problems. Includes concepts, methods, and tools used in accounting system for planning, coordinating, and controlling business activities. Prerequisite: 341, Computer Science 212.

477-3 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.

486-3 Auditing. Standards, objectives, and procedures involved in examining and reporting on financial statements of business organizations. Prerequisite: 322, 341, 365.

495-3 Internship. Supervised work experience in professional accounting. Not for graduate credit. Prerequisite: outstanding record in accounting and recommendation of the departmental committee on internship. Mandatory Pass/Fail.

Administrative Sciences

There is no graduate program offered through the Department of Administrative Sciences. Four-hundred-level courses in this department may be taken for graduate credit unless otherwise indicated in the course description.

402-1 Strategies for Seeking Employment. The job placement process and the work environment from the viewpoint of the applicant. Emphasis on career planning, manpower analysis, placement and interviewing techniques with a stress on the transition from the academic community to the business and professional environment. Not offered for graduate credit. Prerequisite: senior standing or consent of department. Mandatory Pass/Fail.

431-3 Organizational Behavior II. 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. Elective Pass/Fail.

452-3 Management Science I. An introduction to mathematical model building in business and solution techniques commonly used to solve such models. Topical coverage includes introduction to models and decision theory, classical constrained optimization, linear programming and some extensions, inventory, maintenance, and replacement models. Prerequisite: 208, Mathematics 117 or 140 or equivalent, junior standing or consent of department.

453-3 Management Science II. A continuation of 452. Mathematical model building in business and solution techniques commonly used to solve such models. Topical coverage is primarily probabilistic models with an emphasis on inventories, queues, simulation, and decision theory. Prerequisite: 452, junior standing or consent of department.

456-3 Management Systems Applications. 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 or 452 and junior standing or consent of department. Elective Pass/Fail.

457-3 Advanced Management Systems. Survey of systems theory and models related to management and administration of a variety of organizations. Topics include systems analysis, diagnosis, and synthesis; hierarchies; information and control; and general systems theory. Prerequisite: 345, 352 or 452, 341, junior standing or consent of department. Elective Pass/Fail.

474-3 Management 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 his environment and its conflicting demands. Prerequisite: senior standing or consent of department. Elective Pass/Fail.

479-3 Problems in Business and Economics. (Same as Economics 479.) 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: 208 or Economics 308, Economics 215, Marketing 304, and junior standing or consent of department. Elective Pass/Fail.

481-3 Administrative 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 320, Marketing 304, or equivalent. Elective Pass/Fail.

483-3 Advanced Production-Operations Management. Internal problems of managerial control of production including recent developments in theory and techniques; case material will be utilized for the development of analytical ability. Cost of field trips (\$5) must be incurred by the student. Prerequisite: 318, 352 or 452, junior standing or consent of department. Elective Pass/Fail.

485-3 Organizational 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. Elective Pass/Fail.

489-15 (3, 3, 3, 3, 3) Seminar in Administrative Sciences. 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) Personnel. (b) Organization. (c) Systems. (d) Production. (e) Management Science. May be taken singly. Prerequisite: consent of department chairman and instructor. Elective Pass/Fail.

491-1 to 6 Special Topics in Administration. 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 chairman and instructor.

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.

421-3 Management of Business Finance. The principal problems of managing the financial operations of an enterprise. Emphasis upon analysis and solutions of problems pertaining to policy decisions. Prerequisite: 320.

422-3 Acquisitions, Divestments, and Recapitalization. A study of the issues involved in developing financial plans for external growth, divestment, and recapitalization. The case approach is emphasized in the course. Prerequisite: 320.

475-3 Forecasting and Budgeting. Methods and problems associated with the development of data used in planning financial activities. Prerequisite: 320.

476-3 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. Elective Pass/Fail.

480-3 International Financial Management. Financial behavior of multinational firms. Emphasis on the modifications of conventional financial models to incorporate uniquely foreign variables. Prerequisite: 320 and Economics 315.

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, or consent of department.

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 junior standing or higher, or consent of department.

439-3 Industrial Marketing. Analysis of decision criteria related to the marketing of industrial products. Emphasis on program development, formulation of a marketing mix, and the behavioral relationships in the modern industrial organization. Prerequisite: 304 and junior standing or higher, or consent of department.

452-3 Physical Distribution Management. Integration of physical distribution activities of the firm into a system. Transportation and location as elements of the system. Inventories and service as constraints upon the system. Planning, operation, organization, and management of the system. Prerequisite: 304 and junior standing or higher, or consent of 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 junior standing or higher, or consent of department.

493-3 Marketing Policies. A comprehensive and integrative view of marketing policy formulation. Marketing decisions analyzed and discussed. Prerequisite: 329, 363, and 390 (Not more than one to be taken concurrently) and junior standing or higher, or consent of department.

495-3 Quantitative Techniques in Marketing. An introduction to and survey of mathematical tools of decision making in marketing situations. Application of these techniques to the analysis of marketing problems is emphasized. Prerequisite: 304 and Mathematics 117 or 140 and junior standing or higher, or consent of department.

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 his areas of interest. May be repeated for credit only when topics vary. Prerequisite: junior standing or higher and approval of the department chairman 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 \$1.00 to \$6.00.

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.

412-2 Inorganic Preparations. Introduction to modern techniques of syntheses and compound characterization. Synthetic techniques include handling of air-sensitive materials, electrosyntheses, high-temperature reactions, and chemistry of non-aqueous solvents plus modern spectroscopic techniques for characterization. Prerequisite: 226, 347, and 349.

416-3 X-Ray Crystallography. (See Geology 416.) Prerequisite: 224 and 225, or 222b, one 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 transfer of liquids and solids; gas, thin-layer and ion-exchange chromatography; atomic absorption; flame photometry; ion selective electrode potentiometry; and spectrophotometry. The course is intended for senior-level and graduate students in disciplines other than chemistry who desire to know the practical aspects of laboratory measurements. The course is not applicable to a major in chemistry. One lecture, one laboratory-lecture, and two three-hour laboratories per week. Prerequisite: 224 and 225, or 222a,b or nine hours of Chemistry excluding general studies courses. Elective Pass/Fail.

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. Prerequisite: one semester of physical chemistry concurrently.

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: 434 or equivalent, or consent of instructor.

446-3 Qualitative Organic Analysis. A systematic study of the separation and identification of organic compounds. One lecture and six hours of laboratory per week. Prerequisite: 226 and either 348 and 349 or consent of instructor.

450-4 Survey of Biochemistry. Function and metabolism of amino acids, proteins, enzymes, carbohydrates, lipids, and nucleic acids. For preprofessional students, chemistry majors, biology majors, and others desiring a terminal one-semester survey of biochemistry. Three lectures and one laboratory per week. Prerequisite: 346 and 347 or 348 and 349.

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 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. Three lectures and one three-hour laboratory per week. Prerequisite: 226 and Mathematics 150. Elective Pass/Fail.

462-6 (3, 3) Physical Chemistry. Three lectures per week. (a) Thermodynamics and its applications; chemical kinetics. Prerequisite: 226, Mathematics 251; concurrent enrollment in 463A; Mathematics 305 recommended. (b) Quantum mechanics of atoms and molecules; statistical thermodynamics. Prerequisite: 226, Mathematics 251; concurrent enrollment in 463B; Mathematics 305 and 406 recommended.

463-4 (2, 2) Physical Chemistry Laboratory. The sequence covers analysis of data, computational techniques, theory and practice of phenomenological kinetics and spectroscopy, and applications of thermodynamics. Two three-hour laboratories per week. (a) Prerequisite: 226, Mathematics 251; concurrent enrollment in 462a; Mathematics 305 recommended. (b) Prerequisite: 463a; concurrent enrollment in 462b; Mathematics 305 and 406 recommended. Must be taken in a,b sequence.

466-3 Molecular Structure and Spectroscopy. An introduction to the principles of spectroscopy with emphasis on ir., Raman, n.m.r. and e.s.r. spectroscopy. Three lectures per week. Prerequisite: 462a,b.

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 348 and 349.

472-6 (3, 3) X-Ray Crystallography. (See Engineering Mechanics and Materials 402.) Prerequisite: 462b and 463b.

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

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: 224, 225, 346 and 347 or 348 and 349.

491-2 History of Chemistry. The evolution of chemistry from ancient times until 1920. Two lectures per week. Elective Pass/Fail.

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, consent of instructor and department chairman.

500-3 Structural Inorganic and Theoretical Organic Chemistry. An introduction to the above topics for beginning graduate students. Three lectures per week. Prerequisite: one year of undergraduate organic chemistry and 411 or an equivalent undergraduate course in advanced inorganic chemistry.

501-3 Kinetics and Thermodynamics. An introductory graduate course in solution kinetics and thermodynamics. Three lectures per week. Prerequisite: one year of undergraduate physical chemistry.

502-2 Molecular Orbital Theory. An introduction to molecular orbital theory and molecular orbital calculations.

503-4 Applied Spectroscopy and Electronics. Designed to provide a working knowledge of nuclear magnetic resonance, infrared, mass spectroscopy, ultraviolet-visible spectroscopy, electron spin resonance and other instrumental techniques of interest to all graduate students. A basic working knowledge of electronics will also be covered. Two lectures and two three-hour laboratories per week.

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.

519-2 to 9 (2 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 laboratory per week. Prerequisite: 434.

534-3 Analytical Molecular Spectroscopy. Theory and practice of spectroscopic characterizations of organic and inorganic molecules, with emphasis on qualitative identification of molecules and on the relationships of spectroscopic parameters to electronic and molecular structures of molecules via e.s.r., n.m.r., and ir. Three lectures per week. Prerequisite: 434.

539-2 to 9 (2 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 Advanced Organic Chemistry. An advanced course covering covalent bonding, structure, stereo-chemistry, reactions, reaction mechanisms, substituent effects, correlation of physical and chemical properties, and physical methods in organic chemistry. Three lectures per week.

542-3 Advanced Organic Chemistry. Continuation of 541. Three lectures per week. Prerequisite: 541.

549-2 to 9 (2 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.

556-7 (3, 4) Advanced Biochemistry. (a) Physical biochemistry-thermodynamics and kinetics of enzyme systems, physical characterization of biopolymers. (b) Protein structure, function and evolution; nucleic acid structure and function. Must be taken in a,b sequence. Prerequisite: 451a,b or equivalent and one semester of physical chemistry.

559-2 to 9 (2 to 3 per semester) Advanced Topics in Biochemistry. Topic to be announced by the department. Maximum credit nine semester hours. Prerequisite: 451b.

561-3 Chemical Thermodynamics. Basic methods and theories as applied to chemical problems. Three lectures per week. Prerequisite: one year of undergraduate physical chemistry or consent of instructor.

562-6 (3, 3) Quantum Chemistry Basic Principles. Three lectures per week. Prerequisite: one year of undergraduate physical chemistry or consent of instructor; Mathematics 406 recommended.

563-3 Chemical Dynamics. Experimental description and classical theories of the rate of chemical reactions; kinetic theory of non-uniform gases and its application to reacting systems; molecular beam techniques. Three lectures per week. Prerequisite: 462b or consent of instructor.

564-3 Statistical Thermodynamics. Elements of statistical mechanics and application to relatively simple systems. Three lectures per week. Prerequisite: 462b or consent of instructor.

569-2 to 9 (2 to 3 per semester) Advanced Topics in Physical Chemistry. Topic to be announced by the department. Maximum credit nine semester hours. Prerequisite: consent of instructor.

594-2 to 3 Special Readings in Chemistry. Assigned library work in any of the six fields

of chemistry with individual instruction by a staff member. (a) Analytical, (b) Biochemistry, (c) Inorganic, (d) Organic, (e) Physical, (f) History of Chemistry. Maximum credit three hours. Graded *S/U* only.

595-1 Advanced Seminar in Chemistry. Advanced level talks presented by graduate students. (a) Analytical, (b) Biochemistry, (c) Inorganic, (d) Organic, and (e) Physical Chemistry.

597-1 to 15 Professional Training. Experience in teaching of chemistry, instrument operation and special research projects. One hour required each semester in residence. Graded *S/U* only. Prerequisite: graduate standing.

598-1 to 50 (1 to 12 per semester) Research. Maximum credit 50 hours, except by permission of the student's graduate advisory committee. Graded *S/U* only. Prerequisite: consent of chairman.

599-1 to 6 Thesis. A maximum credit six hours. Prerequisite: consent of chairman.

600-1 to 30 (2 to 12 per semester) Dissertation—Doctoral. Requirement for Ph.D. degree, 24 hours. Maximum credit 30 hours, except by permission of the student's graduate advisory committee. Prerequisite: 598.

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 \$5 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.

403-3 Studio Portraiture. History, theory and practice of formal studio portrait photography. Students purchase texts and provide photographic materials and chemicals. \$5 cost for additional laboratory materials. Prerequisite: 322 and consent of department. Elective Pass/Fail.

405-3 Commercial/Industrial Photography. History, theory and practice of commercial and industrial photography. Students purchase texts and provide photographic materials and chemicals. \$5 cost for additional laboratory materials. Prerequisite: 322 and consent of department. Elective Pass/Fail.

406-3 Advertising/Illustrative Photography. History, theory and practice of photography as used for advertising, illustration and editorial purposes. Students purchase texts and provide photographic materials and chemicals. \$5 cost for additional laboratory materials. Prerequisite: 405 and consent of department. Elective Pass/Fail.

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. \$5 cost for additional laboratory materials. Prerequisite: 322 and/or consent of department. Elective Pass/Fail.

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. \$5 cost for additional laboratory materials. Prerequisite: 407 and/or consent of department. Elective Pass/Fail.

415-3 Technical and Scientific Photography. History, theory and application of photographic research methods in science, technology and medicine. Students purchase texts and provide photographic materials and chemicals. \$5 cost for additional laboratory materials. Prerequisite: 322 and consent of department. Elective Pass/Fail.

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. \$5 cost for additional laboratory materials. Prerequisite: 322 and/or consent of department. Elective Pass/Fail.

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. \$5 cost for additional laboratory materials. Prerequisite: 322 and consent of department. Elective Pass/Fail.

421-3 Experimental Darkroom Techniques. Experimental darkroom manipulations of

the straight camera image. Students purchase texts and provide photographic materials and chemicals. \$5 cost for additional laboratory materials. Prerequisite: 322 and consent of department. Elective Pass/Fail.

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. \$5 cost for additional laboratory materials. Prerequisite: 322 and consent of department. Elective Pass/Fail.

423-3 Reconstruction of Color. A study of the principle of color separation in photography as it relates to the processes of dye transfer, silkscreening, lithography, letter press, etching, and other reproduction processes. Students purchase texts and provide photographic materials and chemicals. \$5 cost for additional laboratory materials. Prerequisite: 322. Elective Pass/Fail.

425-3 to 9 Studio Workshop. An intensive workshop focusing on current trends in photography as a fine art. Students provide photographic materials and chemicals. \$5 cost for additional laboratory materials. Prerequisite: 322 and consent of department. Elective Pass/Fail.

452-3 Film Planning and Scripting. Analysis of both scripted and non-scripted films. Script as a basis for production. Practice in preparing film plans, treatments, storyboards and scripts. Students purchase texts. Screening fee. Prerequisite: 355 and/or consent of department. Elective Pass/Fail.

454-3 Graphic/Animated Film Production. Practical course for visual expression related to the graphic film; symbology, composition, kinestasis, animation, typography, color and materials. Students purchase texts and materials. Screening fee. Prerequisite: 355 and 453. Elective Pass/Fail.

455-3 Film Production III. Advanced production by individuals or crews of 16mm sound films from pre-production through shooting. Intensive study of budgeting, production planning, scripting, casting, location and studio shooting techniques, equipment rental, lighting, and double system sound filming. Students provide film stock, processing and sound materials. Screening fee. Prerequisite: 356, 452 and consent of department. Elective Pass/Fail.

456-3 Film Production IV. Continuation of 455 through editing and post production to a first answer print. Intensive study of editing, sound mixing, laboratory procedures and distribution problems. Students provide expendable editing and sound materials and are responsible for laboratory costs. Screening fee. Prerequisite: 455 and consent of department. Elective Pass/Fail.

460-3 History of the Silent Narrative Film. Study of the theatrical film from its beginning to 1930. Screening fee. Students purchase texts. Elective Pass/Fail.

461-3 History of Sound Narrative Film: 1927-1945. Study of the theatrical sound film from its beginnings to 1945. Screening fee. Students purchase texts. Elective Pass/Fail.

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. Elective Pass/Fail.

463-3 History of the Experimental Film. Study of experimentation in cinema from the turn of the century, through the avant garde periods, to contemporary independent films. Screening fee. Students purchase texts. Elective Pass/Fail.

464-3 History of the Contemporary Film. Study of the major movements in theatrical motion pictures from neo-realism to the present. Screening fee. Students purchase texts. Elective Pass/Fail.

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

468-3 Advanced Film Theory. Study of the film theories of Munsterberg, Eisenstein, Kuleshov, Pudovkin, Arnheim, Balaz, Bazin, Kracauer, Wollen, Perkins, Metz, and others. Films which pose particular theoretical problems as well as those which attempt to apply theory are studied. Screening fee. Students purchase texts. Prerequisite: 368. Elective Pass/Fail.

470-1 to 9 (1 to 9, 1 to 9) Advanced Topics. An advanced course concentrating on special topics in cinema or photography. Topics vary and will be announced in advance. (a) Advanced studies in cinema. (b) Advanced studies in photography. Not more than 6 semester hours may be counted toward the M.A. or M.S. degree. A screening fee or a \$5 charge for laboratory materials may be required. Prerequisite: consent of department.

491-1 to 9 Individual Study in Cinema or Photography. Research in history, theory or aesthetics. Usually taken 3, 3, 3. Prerequisite: consent of department. Elective Pass/Fail.

492-1 to 3 Practicum. Practical experience in the presentation of photographic theory and procedures. Not for graduate credit. Prerequisite: consent of department.

495-1 to 12 Internship in Cinema or Photography. Credit for internship with professional film or photographic units. Prerequisite: consent of department.

497-1 to 9 Projects in Cinema or Photography. Individual or crew projects in motion picture production or still photography. Usually taken 3, 3, 3. Additional laboratory materi-

als costing \$5 required for still photography projects. Prerequisite: consent of department. Elective Pass/Fail.

499-4 Senior Thesis. Preparation of a portfolio, film, research or critical paper under the supervision of a cinema and photography faculty member. Normally taken during last term in residence, the senior thesis is evaluated by the departmental faculty. A senior thesis is required of all majors with the following exception: a film completed in 456 may be submitted with approval of the cinema faculty to satisfy the requirements of a senior thesis. In this case, no course hour credit is given for 499. Senior thesis credit, 499, may not be applied to graduate work. The department will retain one copy of all theses. Additional laboratory materials costing \$5 required for still photography projects. Prerequisite: consent of department. Mandatory Pass/Fail.

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) MFA Seminar. A seminar for MFA degree candidates focusing on the artistic development of the participants. Prerequisite: admission to the MFA program in cinema and photography.

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.

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.

Comprehensive Planning and Design, Division of

Clothing and Textiles

There is no approved graduate program in clothing and textiles. Students enrolled in a major in home economics may continue to receive graduate credit for the courses listed below.

Students will be required to purchase additional supplies for some clothing and textiles courses.

405-3 Textile 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.

414-4 Experimental Custom Apparel Designing. Development of apparel to meet esthetic, structural, and functional needs; problem-solving for exceptional proportions, rehabilitation, activity, performing arts, new technology, materials, environment. Some patterns originated in 414 may be tailored following semester in 428. Prerequisite: 314 or consent of chairperson.

416-3 Mass-Market Apparel Designing. Design of a line to specifications; drafting; toiles; mass-production costs; work flow; uses of industrial equipment. Field trips. Prerequisite: 314 or equivalent.

428-3 Custom Tailoring. Individualizing, fitting, and contouring of male or female garment for customer from commercial pattern or from pattern originated in 414 preceding semester. Organization of work and time. Prerequisite: 328, or 414, or consent of chairperson.

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: GSB 211 or Economics 214.

460-3 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. Offered alternate years. Prerequisite: junior standing.

462-3 Historic Clothing: Non-Western Cultures. Traditional dress in non-western cultures. Esthetics, symbolism, and uses of costume in the culture; effect of clothing on economy.

Cultures studied may vary with each offering. Offered alternate years. Prerequisite: junior standing.

482-1 to 6 (1 to 3 per semester) Workshop. Discussion and analysis of current topics in clothing and textiles. Emphasis stated in announcement. Maximum of three hours per topic. Prerequisite: eight hours of clothing and textiles.

484-1 to 3 Seminar. Topics considered at level of design room, research laboratory, mill, store, and consumer. Offered alternate years. Prerequisite: consent of chairperson.

490-1 to 4 Readings. Supervised study of clothing and textiles literature in area of special interest. Prerequisite: senior standing or consent of chairperson.

555-3 Foundations of Fashion. Anthropological approaches to fashion and socio-economic and psychological forces as determinants of fashion in modern times. Usually offered summers. Prerequisite: 351 or consent of chairperson.

573-2 College Teaching of Clothing and Textiles. Central ideas, objectives, and current practices. For preparation of college teachers.

580-3 Research Methods. Study of methods of research in clothing and textiles. Critique of published literature and theses. Development of research design. Prerequisite: statistics or concurrent enrollment.

584-3 Seminar. Individual preparation and presentation of topics related to clothing or textiles. Offered alternate years. Prerequisite: consent of chairperson.

592-1 to 6 Special Problems. Independent study for qualified students. Maximum of three hours counted toward master's degree. Prerequisite: consent of chairman.

597-1 to 3 Pilot Studies. Experimental techniques in apparel design, textile technology, or retailing. Prerequisite: consent of chairman.

599-1 to 6 Thesis. Minimum of three hours to be counted toward a master's degree.

Design

There is no approved graduate program in design. Four-hundred level courses may be taken for graduate credit unless otherwise indicated in the course description.

Students will be expected to purchase their own materials in some of the design courses.

400-3 Portfolio and Resume. An investigation and implementation of the planning, production, and management of interface information such as resume, portfolio, and presentation of self. Not for graduate credit. Prerequisite: 200, 201, 202, 250, 252, 254 plus 9 hours elective on 300 level or consent of chairman.

401-3 Problem Solving in Applied Design. A design team approach solving real problems utilizing the methods and techniques acquired in the design program. Not for graduate credit.

402-3 Advanced Human Engineering. An extension in depth of 252. Subjects will include selection of design criteria, simulation techniques, and application of theory to selected problem areas. Not for graduate credit. Prerequisite: 252 and 9 hours of 300 level core courses.

403-4 Advanced Systems Theory. An interdisciplinary team approach to the analysis of complex problems using systems theory as the analytical tool. Students from the four areas of design specialty; i.e., visual communication, computer aided design, urban planning, and product design will coordinate their efforts to solve selected problems utilizing their existing skills. Not for graduate credit. Prerequisite: 302.

405-3 Environmental Graphics. An introduction to the theory and practice of designing meaningful symbols for the public environment, including spatial perception and typography as related to signage systems, imagery, symbols, color and light. Not for graduate credit.

406-3 Exhibition Design. Techniques of exhibition design from two dimensional linear displays to freestanding traveling units. Not for graduate credit.

412-4 Practicum in Product Design. Advanced comprehensive product design projects developed into production prototypes. Not for graduate credit.

413-3 Professional Practice in Product Design. The study of designer/client relationships, business practices, design office procedures, and professional ethics. Not for graduate credit.

422-3 Visual Communication III. Principles of visual message making and investigation of symbols as they are used in communication. Study includes the development of contemporary communication techniques including photographics, topography, color, and illustration as well as learning to identify techniques and processes of communication. Not for graduate credit. Prerequisite: 372.

423-3 Multi-Media Exploration. Experimentation into various forms of electronic and sensory media as a form of visual expression, documentation, and research. Film making, animation techniques, 35mm slide format and VTR will be explored. Not for graduate credit. Prerequisite: 372 and 373.

432-3 Landscape Architecture. Study of the principles of urban and regional landscape architecture and an introduction to the elements of landscape and architecture. Site analysis and site planning are studied in relation to structures and large scale developments. Technical aspects of site development are stressed. Not for graduate credit.

433-4 Urban Design III. Continuation of urban design II with emphasis on client interaction. Projects dealing with community groups and advocacy planning needs will be dealt with where appropriate. Not for graduate credit. Prerequisite: 381.

442-4 Principles of Computer Graphics. Contemporary methods, including basic mathematical techniques, for the representation, manipulation, and display of two- and three-dimensional objects. Not for graduate credit. Prerequisite: 392 and Computer Science 202.

450-1 to 6 Internship. Supervised work experience related to student's academic program and career objectives. Not repeatable for credit. Not for graduate credit. Prerequisite: consent of chairperson. Mandatory Pass/Fail.

462-4 Research in Product Design. Not for graduate credit. Prerequisite: consent of chairman, declared specialty in product design.

463-4 Products for Special Populations. Products for special subset groups within greater population norms. May be of cross-cultural and interdisciplinary implementation. Not for graduate credit.

464-4 Environmentally-Integrated Products. Development of products integral to comprehensive environmental planning. Not for graduate credit.

465-2 to 4 Independent Study in Product Design. Creative project developed by student and faculty sponsor and approved by chairman. Not for graduate credit.

472-3 Visual Communication IV. Advanced problems in visual communication, with emphasis on creative research and experimental solutions. The course will allow opportunity to explore various approaches to visual communication problems: combinations of two and three dimensions, film, etc. Not for graduate credit. Prerequisite: 422.

485-3 Special Projects in Landscape Architecture. Special projects framework for advanced undergraduate to do research on a tutorial basis. Not for graduate credit.

492-4 Computer Aided Design. Advanced exploration of computers and the design process. Emphasizes topics in structural, architectural, and planning areas. Not for graduate credit. Prerequisite: 392 and 442.

493-4 Advanced Topics in Computer Aided Design. Applications of computer aided design to design specialties. Course emphasizes interdisciplinary topics. Prerequisite: 442 and 492.

495-3 to 9 Seminar in Design. Special projects in design developed with adjunct and visiting professors and staff. Not for graduate credit.

499-3 to 9 Senior Honors Research. Research projects for senior honors students developed by the student and faculty sponsor and approved by department chairman. Not for graduate credit. Prerequisite: consent of instructor.

Interior Design

There is no approved graduate program in interior design. Students currently enrolled in the concentration in family economics and management of the home economics program may continue to receive graduate credit for the courses listed below.

418-1 to 6 Workshop in Interior Design. Current problems facing the professional interior designer. Discussion, reports, lectures, design solution presentations, and other methods of analyzing and working on design problems. Prerequisite: 28 hours in interior design or consent of chairman.

470-3 Interior Design Seminar. Development of systematic approach involving systems analysis, human factors engineering, environmental variables. Prerequisite: eight hours in interior design or consent of chairman.

481-1 to 4 Readings. Selected readings in the area of individual interests in design-related research. Prerequisite: 28 hours in interior design or consent of chairman.

491-4 Advanced Interior Design. Systematic analysis of human factors as determinants of design solutions for large-scale interiors. Lecture and laboratory. Prerequisite: 391c, 394, or consent of chairman.

492-1 to 5 Special Problems. Directed independent work and study in areas determined by the student's interests and needs. Lecture and laboratory. Prerequisite: 18 hours in interior design or consent of chairman.

Computer Science

401-3 Computer Organization. Computer main frame architecture; control unit, arithmetic/logic unit, memory, other features. Input/output devices, mass storage devices, channels, and communications equipment. Computer systems configurations design and comparison. Prerequisite: 306 and 342.

411-3 Programming Languages. Study of the significant features of existing programming languages with particular emphasis on the underlying concepts abstracted from these

languages. Includes formal specification of syntax and semantics, representation and evaluation of simple statements, grouping of statements, scopes and storage allocation, procedures. Prerequisite: 304 or concurrent enrollment.

414-3 Introduction to Operating Systems. Operating systems: batch, multiprogramming, multiprocessing, and time-sharing systems. Specific treatment of one operating system with respect to scheduling, program initiation, memory allocation, CPU allocation, and input/output control. Prerequisite: 306.

430-3 File Organization. Organization of records and blocks. Design of files, file system, and access methods. File maintenance, external sorting, and searching. Techniques for creating and using hashed files. Introduction to the concepts of data base systems. Prerequisite: 306.

435-3 Information Systems Analysis. 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.

438-3 Introduction to Telecommunications. Time dependent computational processes. Hardware and software considerations. Dialogue design. System design and implementation. Prerequisite: 306.

445-3 Boolean Algebra and Logical Design. (Same as Mathematics 445.) Boolean algebra with applications to computer logic and circuit design. Simplification algorithms. Sequential circuits and sequential machines. Introduction to error-correcting codes. Prerequisite: 342 or Mathematics 319.

449-3 Combinatorics and Graph Theory. (Same as Mathematics 449.) An introduction to graph theory and combinatorial mathematics with computing applications. Topics include permutations and combinations, generating functions, recurrence relations, the principle of inclusion and exclusion, Polya's theory of counting, graph theory, transport networks, matching theory, block designs. Prerequisite: 342.

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. The relationship between grammars and machines with emphasis on regular expressions and context-free languages. Prerequisite: 445.

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, Mathematics 250, and Mathematics 221.

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 either Mathematics 280 or 480 or 483 or consent of instructor.

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, Mathematics 221, and Mathematics 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 either Mathematics 139 or 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-deminsional graphics, graphics system design and configuration, low and high level graphics languages, and applications. Prerequisite: 306 and Mathematics 111 or equivalent.

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 Organization. Microprogrammable computer systems. Modular computer design concepts. Microprocessors. Design concepts of stack and parallel computers. Overlap and pipeline processing. Other current topics in computer organization. Prerequisite: 401 and 445.

514-3 Systems Programming. Design and analysis of multiprogramming, multiprocess-

ing, and time-sharing operating systems. Implementation of a simple, complete operating system. Current topics in systems programming. Prerequisite: 414.

516-3 Compiler Construction. Design of a simple, complete compiler, including lexical analysis, syntactical analysis, and code generation. Advanced topics selected from mixed arithmetic, procedures and parameters, optimization, compiler writing systems. Prerequisite: 306 and 411.

531-3 Text Processing and Data Base Systems. Machine indexing, classification, and abstracting techniques. Automatic text analysis. Data base systems. Prerequisite: 430.

536-3 Artificial Intelligence and Heuristic Programming. Heuristic methods including applications to problem-solving and game playing. Theorem proving: resolution principle, strategies, achievements. Selected topics from learning and adaptive systems, self-organizing systems, simulation of natural systems, pattern recognition, question-answering. Prerequisite: 304 or consent of instructor.

553-3 Formal Languages and Automata. (Same as Mathematics 528.) Algebraic analysis of automata with emphasis on semigroup and decomposition theory. Probabilistic automata. Grammars including regular, context-free, context-sensitive and type zero. Normal forms, restricted grammars. Closure properties. The relation between grammars and automata. Basic decision problems. Prerequisite: 451.

555-3 Theory of Computability. (Same as Mathematics 529.) Turing machines and recursive functions. Church's thesis. Solvable and unsolvable problems. Introduction to complexity theory including the classes P and NP. Polynomial time approximation algorithms for NP-complete problems. Prerequisite: 451.

564-1 to 9 Advanced Numerical Analysis. (Same as Mathematics 592.) 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.

590-1 to 9 Readings. Supervised readings in selected subjects. Graded *S/U* only. Prerequisite: consent of instructor and department.

591-1 to 9 (1 to 3 per topic) Special Topics. Selected advanced topics from the various fields of computer science are investigated. Graded *S/U* only. Prerequisite: consent of department.

592-1 to 6 (1 to 3 per semester) Special Problems. Individual projects involving independent work. Graded *S/U* only. Prerequisite: consent of department.

593-1 to 4 Seminar. Preparation and presentation of reports. Graded *S/U* only. Prerequisite: consent of instructor.

599-1 to 5 Thesis. Minimum of three hours to be counted toward a master's degree. Prerequisite: consent of department.

Curriculum, Instruction, and Media

400-2 Simulation and Gaming. The role of simulation and gaming in instruction, the availability of commercial games and simulation devices, and the theoretical backgrounds used in constructing teacher-made games are to be examined.

401-1 to 3 Problems in Public School Reading. Requires attendance at all sessions of a reading conference; preparation of a paper showing practical applications of theory to the student's own teaching situation.

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.

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: specialist 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.

- 415-3 Improvement of Instruction in Middle School Mathematics (Grades 4-8).** Examines recent findings, current practices, and materials in the middle school setting. Prerequisite: 315 or consent of instructor.
- 418-2 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. Student's analysis of 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.
- 436-2 Library Research Methods.** Introduction to the use of library materials for graduate research. The use of bibliographies and reference works in various subjects. Students will consult sources in their own disciplines. Not open to students in the educational media program.
- 437-3 Educational Media in Training Programs in Business and Industry.** The utilization of visual, audio, electronic, display, and print media in industrial and business training programs. Includes experiences in using sources, selecting and evaluating media, the operation and maintenance of media hardware and the use of multi-media. Not open to students pursuing a graduate major in educational media.
- 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 library.
- 440-3 Selection of Media.** Evaluation of print and non-print media; resources and services; competencies for efficient purchasing and selecting of media.
- 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 Media for Young People.** 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.
- 451-3 Photographic Preparation of Educational Media.** Techniques of photography used in producing prints, overhead transparencies, daylight slides, high contrast materials, picture stories, filmstrips, and other photographic instructional materials. Prerequisite: 450 or consent of instructor.
- 453-3 Local Production of Educational Media.** The study of the various processes and techniques used by classroom teachers in the production of locally-made nonphotographic instructional material.

- 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 extra-class activities and programs in public schools with a focus on the status, trends, organization, administration, and problems.
- 468-3 Science Methods for Junior and Senior High Schools.** An analysis of the skills and strategies needed for effective science instruction in the secondary school. The acquisition of teaching skills and the development of instructional materials. Classroom observation and one or more field trips may be required.
- 469-2 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.
- 496-2 to 6 (2 to 4 per semester) Field Study Abroad.** Orientation and study before travel, readings, reports, and planned travel. Includes visits to cultural and educational institutions. Maximum credit hours in any term is 4.
- 498-1 to 15 (1 to 3 per topic) Workshops in Education.** Critical evaluation of innovative programs and practices. Acquaints teachers within a single school system or in a closely associated cluster of school systems with the philosophical and psychological considerations and methods of implementation of new programs and practices in each of the following areas: (a) Curriculum, (b) Supervision for Instructional Improvement, (c) Language Arts, (d) Science, (e) Mathematics, (f) Reading, (g) Social Studies, (h) Early Childhood Education, (i) Elementary Education, (j) The Middle School, (k) Secondary Education, (l) Disadvantaged Children and Youth, (m) Instruction, (n) Educational Media, and (o) Environmental Education, (p) Children's Literature. Prerequisite: consent of instructor. Maximum of six hours toward a master's degree.
- 500-3 Research Methods in Education.** Introduction to educational research and designs, writing techniques, and evaluative processes in education.
- 501-3 Organization and Administration of Reading Programs.** For reading specialists, consultants, supervisors, and instructional leaders. Recent trends in organization, administration of reading programs, K-community college; materials, equipment, budget for special programs; study of roles of various personnel; and in-service preparation programs. Specific problems of class members are studied. Prerequisite: 512 or 561.
- 502-3 Education of Disadvantaged Students: Research and Teaching.** Deals with research in selected areas within the total context of urban and rural disadvantaged children. Emphasis is placed on such issues as problems of administration, teaching, and curriculum problems, research in the social sciences, and subject matter areas as each of these topics is related to school, community, and students.
- 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.
- 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.
- 511-3 Seminar in Psychology of Elementary School Subjects.** Psychological principles of learning theories as applied to the mastery of materials used in elementary and early childhood education school subjects. Emphasis is placed on implications of theories of learning for curriculum development and instruction.
- 512-3 Reading in the Elementary School.** First course in the reading sequence. Survey of the reading process. Introduction to factors affecting the reading process, the common core of skills, teaching strategies, materials, and research.

513-3 Kindergarten-Primary Reading. A survey of problems and methodology in the developmental reading program for the primary grades. Emphasis placed upon prevention of reading difficulties.

515-3 Diagnosis and Correction of Mathematics Disabilities. Causes of mathematical difficulties, observations and instrument procedures, experience in preparing materials for diagnosing and for corrective purposes. Prerequisite: 407E.

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 Education. 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.

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

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.

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 Research in Elementary Education. Critical analysis of the most significant research studies in foundation, organization, learning, instruction, curriculum, evaluation, and specialty areas in elementary education.

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 School Media Center. Designed to round out the student's preparation for reference work in the school media center. The techniques of developing 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.

540-2 Mass Communications in Education. The use of mass media in the classroom. Includes radio, television, comic books, newspapers, magazines, and motion pictures.

542-3 Administration of an Educational Media Center. Designed to further the training of specialists in the supervision and administration of an integrated audiovisual and library program at the district level. It is based on the concept of a single agency in the school system which encompasses all forms of educational media. Prerequisite: 442 or consent of instructor.

544-3 Administration of the Community College Media Program. Includes decision-making, personnel, budget, public relations, building programs and plans, selection of instructional equipment and furniture, and long-range planning and development. Theories and practices in the administration of the community college media center. Field trips are planned.

545-3 Selection for the Community College Media Program. The selection of written and recorded materials of all kinds for the community college library. Deals also with the accessibility of materials, information retrieval, and the preparation of bibliographies. Prerequisite: 440.

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.

548-5 Production and Utilization of Media. The study of production, utilization, selection and evaluation of print and audiovisual media. Emphasis will also be given to techniques for producing and designing media to fit the needs of a specific teaching problem.

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.

550-3 History of Media. The evolution of print from cuneiform tablets to the mass printing process. The invention of photography, motion pictures, sound recordings, radio, and television. The change in storage of information from clay tablets to microfiche.

551-4 Survey of Research and Developments in Educational Media. Survey of research, research techniques, needed research, and new developments and programs in educational media. Investigation of new curriculum and organizational developments in the public schools as related to educational media.

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 Integration of Educational Media. The utilization and integration of print and non-print materials in the teaching approach. Structured for media directors and 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 Learning. Learning from 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.

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 junior and senior high school teachers who desire a foundation in reading. Emphasis placed on the basic skills appraisal of reading abilities, materials of instruction, and methods of teaching reading in the content areas.

569-3 Principles and Trends in Secondary School Social Studies Education. An evaluation and study of social studies trends and practices as they are related to curriculum, organization, and instruction at the junior and senior high school and community college levels.

571-3 Secondary School Curriculum. An introductory course designed to explore the nature and development of the curriculum at the secondary school level. Historical perspective and foundations of curriculum are examined. Functional applications to the public secondary schools are emphasized.

573-3 Perspectives on the Future and Its Schools. Deals with the future development of education and social trends which will influence that development. Emphasis is placed upon alternative models of education and their social bases.

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 Research in Secondary Education. Critical analysis of the most significant research studies in the foundations, organization, learning, instruction, curriculum, evaluation, and certain specialty areas in secondary education.

585-3 to 15 (3 per topic) Seminars in Education. A series of seminars for specialized study of significant aspects of educational problems, practices, issues, trends, research, policies, and programs. Areas of study are: (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) Disadvantaged Children and Youth, (m) Instruction, (n) Educational Media, and (o) Environmental Education, (p) Children's Literature. Maximum of six hours toward a master's degree. Prerequisite: consent of instructor.

586-3 Curriculum Design and Development. Deals with organizing the staff for maximum participation in curricular decision-making, determining content scope and sequence, creating and producing curriculum materials, and relating these materials to educational programs at various levels.

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.

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 Education, (i) Elementary Education, (j) The Middle School, (k) Secondary Education, (l) Disadvantaged Children and Youth, (m) Instruction, (n) Educational Media, and (o) Environmental Education, (p) Children's Literature. 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 Education, (i) Elementary Education, (j) The Middle School, (k) Secondary Education, (l) Disadvantaged Children and Youth, (m) Instruction, (n) Educational Media, and (o) Environmental Education, (p) Children's Literature. Maximum of three hours counted toward a master's degree. Prerequisite: consent of instructor.

594-(3 to 9 per topic) Practicum. For master's degree students: professional consultation, teaching demonstration, practical application of advanced theory, work with clinical cases, or program development, implementation, and evaluation in school systems, community colleges, or universities. Reading and research directed to special problems involved in on-site situations 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 Education, (i) Elementary Education, (j) The Middle School, (k) Secondary Education, (l) Disadvantaged Children and Youth, (m) Instruction, (n) Educational Media, and (o) Environmental 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. Each student engages in specialized service areas either in his 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 Education, (i) Elementary Education, (j) The Middle School, (k) Secondary Education, (l) Disadvantaged Children and Youth, (m) Instruction, (n) Educational Media, and (o) Environmental 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 working for the sixth year specialist degree. The work should be done in the setting of a school system where 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. Prerequisite: consent of instructor.

599-2 to 6 Thesis. Minimum of four hours to be counted toward a master's degree.

600-1 to 32 (1 to 16 per semester) Dissertation. Minimum of 24 hours for the Doctor of Philosophy degree.

Economics

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: 315 or 340 or 341 or consent of instructor. Elective Pass/Fail.

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. Elective Pass/Fail.

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. Elective Pass/Fail.

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. Elective Pass/Fail.

429-3 International Trade and Finance. Analysis of the pattern and volume of world trade and capital flows; effects of trade and payments on the domestic economy; problems and methods of adjusting to change in the balance of payments. Prerequisite: 340 and 341 or consent of instructor. Elective Pass/Fail.

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 consent of instructor. Elective Pass/Fail.

436-3 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: GSB 211 and 212 or equivalents or consent of instructor. Elective Pass/Fail.

440-3 Price, Output, and Allocation Theories. A systematic survey of theories of product prices, wage rates, rates of production and resource utilization under conditions of competition, monopolistic competition, oligopoly and monopoly markets. Emphasis is on developing analytical tools useful in the social sciences. Not open to students who have had Economics 340. Prerequisite: 215 or consent of instructor. Elective Pass/Fail.

441-3 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. Elective Pass/Fail.

442-3 Monopoly and Competition in the Industrial State. A survey of economic theories and empirical studies on the nature and consequences of business rivalry in imperfectly competitive markets. Prerequisite: 340 or 440 or consent of instructor. Elective Pass/Fail.

443-3 Senior Seminar in Economics and Problems and Policy. Application of the tools of economic analysis to the study of contemporary social problems. Economics graduate students not permitted to enroll in this course. Prerequisite: 440 and 441; or 340 and 341; senior standing. Elective Pass/Fail.

465-3 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. Elective Pass/Fail.

467-3 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 or consent of instructor. Elective Pass/Fail.

471-3 Land Resource Economics. (See Agricultural Industries 440.) Elective Pass/Fail.

479-3 Problems in Business and Economics. (Same as Administrative Sciences 479.) 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. Elective Pass/Fail.

481-3 Comparative Economic Systems. Capitalism, socialism, communism and other forms of social organization are examined from a theoretical point of view. Economic and social theories from Adam Smith and Karl Marx to Milton Friedman and Paul Sweezy will be examined. Prerequisite: 340 to 440 or consent of instructor. Elective Pass/Fail.

490-3 Workshop in Economic Education. (Same as Secondary Education 490.) Designed to assist elementary and secondary school teachers in promoting economic understanding in the minds of their students through the translation of economic principles and problems into classroom teaching materials. Elective Pass/Fail.

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 chairman.

502-1 to 4 Readings in Resource Economics. (See Forestry 590.)

505-1 to 8 Political Economy Seminar. Cooperative teaching in the political economy area. Designed to introduce students to contemporary problems in political economy emphasizing the research interest of the faculty and students. Graded *S/U* only. Prerequisite: consent of instructor.

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 the 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 Economics in Geography and Planning II. (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.

526-3 Managerial Economics. A course in the economics of the firm. Designed to develop a conceptual framework for business decision making with emphasis on demand, costs, prices, and profits. Credit may not be earned for both Economics 440 and this course. Prerequisite: 214 and 215, 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. Emphasized 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.

538-3 Advanced Price, Output, and Allocation Theories. A systematic development of production, distribution, and allocation theories for competitive and non-competitive markets. Prerequisite: 340 or 440 or consent of instructor.

540-8 (4, 4) Microeconomic Theory I and II. Taken in a,b sequence except with consent of instructor. Prerequisite: 340 or 440 or consent of instructor.

541-6 (3, 3) Macroeconomic Theory I and II. Taken in a,b sequence except with consent of instructor. Prerequisite: 441 or 341 or consent of instructor.

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. Related 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: Mathematics 514 or consent of instructor.

570-3 Seminar in Contemporary Microeconomic Theory. An investigation of recent developments and current controversies in economic theory with emphasis on microeconomic problems. Prerequisite: 540B.

571-3 Seminar in Contemporary Macroeconomic Theory. An investigation of recent developments and current controversies in economic theory with emphasis on macroeconomic problems. Prerequisite: 541B or consent of instructor.

575-3 Microeconomic Regulations. An analysis of the economic causes and effects of the regulation of agriculture, business, and labor. Prerequisite: 440 or 340 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.

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.

Education

400-4 Student Teaching. A requirement in the undergraduate professional education sequence, 400 represents preliminary student teaching experiences necessary for certification entitlement. Enrollment in this course must be arranged through the Office of Professional Education Experiences. For undergraduate credit only. Students majoring in special education and seeking entitlement to more than one teaching certificate in the State of Illinois may in certain instances be allowed credit for up to 8 semester hours of Education 400. Such increase in hours shall be contingent on the student enrolling in 4 hours of Education 400 in each of the two semesters, and shall require the written permission of the coordinator of professional education experiences. Prerequisite: admission to the Teacher Education Program, acceptance for student teaching, and concurrent enrollment in 350 and 401.

401-8 Student Teaching. A requirement in the undergraduate Professional Education Sequence, 401 concludes the student teaching experience necessary for certification entitlement. Enrollment in this course must be arranged through the Office of Professional Education Experiences. For undergraduate credit only. Prerequisite: admission to the Teacher Education Program, acceptance for student teaching, and concurrent enrollment in 350 and 400.

450-1 to 10 Experimental Education. Offered for purposes of testing new and experimental courses and series of courses within the College of Education. Prerequisite: consent of instructor.

550-1 to 10 Experimental Education. Offered for purposes of testing new and experimental courses and series of courses within the College of Education. Prerequisite: consent of instructor.

590-4 Doctoral Seminar in Cultural Foundations of Education. This seminar is one of two courses required for all students pursuing a doctoral program in the College of Education. The primary objectives are to aid in the development of the doctoral student's own nature and reflective theory of education; to help students pursue their scholarly activities in relation to the whole field of education; and to make the student aware of the 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, assump-

tions 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 Leadership

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 and Community Education. The focus for this workshop is to provide quality in-service education for practitioners in the field of adult and community education with a variety of specialties.

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.

465-3 Organization and Administration of Adult and Community 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.

500-3 Educational Research Methods. Introduction to educational research with practical training in research writing and evaluation techniques in education. Previous or concurrent enrollment in measurement and/or statistics recommended.

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 his role in relation to guidance, curriculum, schedule-making, extra-curricular activities, public relations, budgeting of time, etc.

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 Cultural Foundations of Adult Education. To define the awareness of adult education as a unique aspect within the broad field of education, and to develop an understanding of the principles underlying all phases of adult education.

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.

513-3 Supervision of Instruction. The function of the principal and/or 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.

515-1 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.

517-3 The Legal Framework of Education. A study of administrative, judicial, statutory, and constitutional laws which have application in American public schools.

519-3 Illinois School Law. A study of administrative, judicial, statutory, and constitutional laws which have application in the Illinois public schools.

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 Systems Analysis: An Application to Education. The application of methods which facilitate the planning, evaluation, and decision making processes as they relate to accountability, cost analysis efficiency, and effectiveness. Emphasis is placed upon understanding the "systems concept", planning and controlling within a system, system cost analysis, and managing a system.

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.

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.

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 Board 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 principalship. Designed to meet many of the particular needs of persons interested in becoming elementary principals. Other persons such as teachers, superintendents, and staff personnel will gain insight into problems and responsibilities of the elementary principal's role.

539-3 Evaluation and Accreditation in Public 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.

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.

551-3 Educational Leadership: 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 Education. A general introduction to comparative and international education. Comparison of educational ideas and practices of various countries in major regions of the world.

553-3 Educational Leadership: 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: consent of instructor.

555-3 Advanced Educational Administration Theory. An advanced seminar devoted to

the study of classical and modern theories concerning the administration of complex organizations. Particular emphasis is placed on organizations as social units that pursue specific goals which they are structured to serve. The major areas of study are organizational goals, organizational structure, and organizations and their social environment. Prerequisite: 503 or equivalent.

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 to 9 (3, 3, 3) Advanced Seminar in Comparative Education. A study of foreign educational systems in historical, cultural, political, and world perspective. Areas of the world or specific countries are indicated by the following letters: (e) England, (m) Mexico, (s) Soviet Union.

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.

562-3 Education and the American Way of Life. An exploration of the themes that have shaped life in the United States and the relation of these themes to education.

564-3 Education and the Challenges of the Twentieth Century. An exploration of major movements in the contemporary world in terms of their importance for American education.

588-3 to 9 General Graduate Seminar. Selected topics or problems in cultural foundations of education. Prerequisite: advanced standing and consent of instructor.

590-1 to 6 Readings in Administration and Foundations. 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. Prerequisite: consent of chairman.

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. Prerequisite: consent of chairman.

595-1 to 8 Internships in Educational Administration. Theory and practice in educational administration in cooperation with a work experience in an educational setting. Prerequisite: consent of student's adviser or committee and chairman.

596-1 to 6 Independent Investigation. Field study required or each student working for the sixth year specialist degree.

597-1 to 8 Externship. Externship conducted at home institution of Fellows in the federally funded program "Developing Leaders in Developing Institutions." The student, cooperating with the program director and president of the home institution, identifies a major problem at the home institution which becomes a focus of the student's dissertation.

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.

Engineering

Safety glasses are required for some courses in this area.

443-4 Engineering Design. Projects of an 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 in engineering. Prerequisite: senior standing in engineering.

455-3 Engineering Geology. (See Geology 455.)

Electrical Sciences and Systems Engineering

Graduate work in the Department of Electrical Sciences and Systems Engineering is offered toward a concentration for the Master of Science degree in Engineering. Safety glasses are required for some of the courses in this department. Four-

hundred-level courses in this department may be taken for graduate credit unless otherwise indicated in the course description.

421-2 Digital Computers in Applied Physical Research. Computational techniques for matrix inversion, solution of linear equations, and characteristic roots and vectors. Least squares analysis, curve-fitting, and regression. Numerical quadrature. Solution of 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. Elective Pass/Fail.

426-3 Hybrid Computation. Use of analog and digital computers for solution of engineering problems. Comparison between analog and digital problem-solving techniques. Hybrid simulation of engineering systems. Prerequisite: Engineering 222 and Mathematics 305, or consent of instructor. Elective Pass/Fail.

427-3 Digital-Systems Design I. Concepts of digital systems. Relation of Boolean algebra to switching circuits. Combinational logic circuit implementation. Minimization of combinational functions by algebraic techniques, Karnaugh mapping, and tabular methods. Sequential systems. Basic design methods for synchronous systems. Prerequisite: Engineering 345 or senior standing. Elective Pass/Fail.

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. Prerequisite: 455 or concurrent enrollment. Elective Pass/Fail.

447-2 Applications of Modern Electronic Devices. Physical mechanisms governing fabrication and operation of transistor, charge-transfer, photosensitive, display, and Hall-effect devices. Techniques of fabrication of integrated circuits and hybrid microelectronics. Device design. Prerequisite: Engineering 312 and 345. Elective Pass/Fail.

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. Elective Pass/Fail.

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. Elective Pass/Fail.

457-3 Systems Theory. In-depth study of system concepts 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. Elective Pass/Fail.

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. Elective Pass/Fail.

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. Elective Pass/Fail.

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. Prerequisite: Engineering 345. Elective Pass/Fail.

476-3 Electromagnetic Fields I. Electric and magnetic fields using vector analysis. Evolution of Maxwell's equations through the laws of Coulomb, Gauss, Ampere, and Faraday. Concepts of energy and potential. Poisson and Laplace fields. Wave equation and plane waves. Transmission lines. Prerequisite: Mathematics 305. Elective Pass/Fail.

477-3 Electromagnetic Fields II and Microwaves. Application of Maxwell's equations and the laws of electromagnetics to boundary-value problems, microwave devices, guiding structures, and radiating structures. Poynting's theorem and energy relationships. Lecture and laboratory. Prerequisite: 476. Elective Pass/Fail.

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. Elective Pass/Fail.

487-4 Power Systems Analysis I. Introduction to analysis of electric power systems. Modeling of power system components. Power system configuration. Control of power and frequency. Control of voltage and reactive power. Load-flow analysis. Introduction to symmetrical components. Prerequisite: Engineering 385. Elective Pass/Fail.

492-1 to 5 Special Problems in Engineering. Topics and problems selected either by student or instructor. Prerequisite: senior standing and consent of instructor. Elective Pass/Fail.

527-3 Digital Systems Design II. Synchronous and asynchronous sequential-systems analysis, design, and optimization. Number systems. Arithmetic-system design. Codes, code conversion, and linear sequential circuits. Digital contact networks. Analog/Digital conversion. Prerequisite: 427.

536-3 Network Synthesis. Introduction to modern network synthesis. Driving point and transfer functions. Positive real functions, Foster networks, and Cauer networks. Active network elements. Synthesis using active elements. Prerequisite: 445 or consent of instructor.

547-3 Solid-State Theory of Electronic Materials. Electronic properties of materials and their application to practical devices. Quantum and statistical mechanics. Semiconductor principles and devices. Thermo-electric phenomena. Magnetic materials. Quantum electronics and lasers. Prerequisite: consent of instructor.

556-3 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.

557-6 (3, 3) Complex Systems. Theory, techniques, and philosophy of analyzing and designing complex engineering systems. Methods which maintain generality in dealing with complex combinations of diverse subsystems such as electrical, mechanical, chemical, transport, and biological. Prerequisite: 457 or consent of instructor.

577-4 Electromagnetic Fields III. Application of Maxwell's equations and the laws of electromagnetics to more advanced boundary-value problems, circuits, propagation and reflection, guiding structures, and antennas. Prerequisite: 477 or consent of instructor.

580-1 to 4 Seminar. Collective and individual study of selected issues and problems relating to various engineering areas.

586-3 Power Systems Analysis II. Techniques for solving power system problems. Network reduction. Load-flow, short-circuit, and transient-stability studies. Utilization of digital and analog computers. Prerequisite: 487.

592-1 to 5 Special Investigations in Engineering. Advanced engineering topics or problems. Prerequisite: graduate standing and consent of instructor.

599-1 to 6 Thesis.

Engineering Mechanics and Materials

Graduate work in the Department of Engineering Mechanics and Materials 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.

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 313 or equivalent or consent of instructor. Elective Pass/Fail.

413-3 Mechanics of Fluids—Analysis and Design. The analysis and design of the elements of fluid systems. Fluid machinery; open and closed conduit systems; flow through porous media; principles of propulsion. Selected design topics. Prerequisite: Engineering 313 or equivalent.

414-2 Intermediate Fluid Mechanics. A coherent presentation of the specialized topics of fluid dynamics from the common analytical background of the general equations of motion. Real fluid flow theory and the Navier-Stokes equations. The potential flow theory and the Laplace equation. Introduction to conformal mapping. Numerical methods. The Boundary Layer theory. Dynamic similitude. Normalized equations of motion and energy. Modeling ratios. Prerequisite: Engineering 313 or equivalent.

417-3 Fundamental Compressible Fluid Flow. Equations of motion for compressible flow. Wave propagation in compressible media. Isentropic flow of a perfect gas. Normal shock waves. Oblique shock waves. Prandtl Meyer flow. Flow with friction, heat addition and heat loss. Flow with applied magnetic fields. Imperfect gas effects. Prerequisite: Engineering 313 or equivalent.

419-3 Soil Mechanics and Foundation Engineering Design. Study of soil behavior and its application in foundation engineering. Laboratory. Soil-water systems and interactive forces; stress-strain characteristics; effective stress concept; drained and undrained conditions for saturated soils; theory of consolidation. Design of retaining walls, earth dams, shallow and deep foundations. Prerequisite: Engineering 311; 313; or consent of instructor.

440-3 Structures. An introduction to structural engineering. The design procedure. Loads. Types of structures. Structural materials, safety. Social and environmental considerations. Analysis of structures. Influence lines. Deflections. Slope deflection. Moment distribution. Matrix methods. Prerequisite: Engineering 311 or consent of instructor.

441-3 Vibrations in Machines and Structures. Systems with several degrees of freedom. Equations of motion. Phasor and trigonometric solution. Applications. Prerequisite: Engineering 260b and Mathematics 305.

442-3 Structural Steel Design. An introduction to structural steel design with emphasis

on buildings. Composite design. Plate girders. Rigid frames. Prerequisite: 440 or consent of instructor.

444-3 Reinforced Concrete Design. Behavior and strength design of reinforced concrete beams, slabs, compression members, and footings. Prerequisite: 440 or consent of instructor.

447-2 Intermediate Mechanics of Materials and Structures. Shear center for beams. Unsymmetrical bending. Flexure of curved members. Contact stresses. Energy methods. Inelasticity in one dimension. Buckling formulas. Prerequisite: Engineering 311.

448-3 Experimental Stress Analysis. Theoretical and experimental methods of determining stresses and strains; use of optical, electrical, and mechanical instrumentation; relation of model and prototype; brittle coating; electrical resistance gages; Moire analysis; two-dimensional photoelastic method. Laboratory. Prerequisite: Engineering 311.

449-2 Intermediate Dynamics. Kinematics and kinetics of plane and three-dimensional motion. The principles of work and energy applied to the motion of rigid bodies. The principle of impulse-momentum applied to variable mass and rigid body systems including gyroscopic motion. Vibrational analysis of single degree of freedom systems. Prerequisite: Engineering 260b.

451-3 Numerical Methods in Mechanics. An introduction to the available numerical methods and techniques which are employed to solve engineering problems with special emphasis devoted to areas of mechanics involving stress analysis, vibrations, fluid flows, mechanisms, and structures. Prerequisite: Engineering 222, 311, 313 or consent of instructor.

458-2 Photoelasticity. Optics related to photoelasticity; theory of photoelasticity; photoelastic model materials; analysis techniques; three-dimensional photoelasticity; birefringent coatings; holography in photoelasticity; application of photoelastic methods in industrial problems. Laboratory. Prerequisite: Engineering 311.

462-3 Matrix Methods of Structural Analysis. Flexibility method and stiffness method applied to framed structures. Introduction to finite elements. Prerequisite: Engineering 222 and 311 or consent of instructor.

464-2 Intermediate Materials Science. Internal structure, treatment, and properties of metals and intermetallic compounds. Theory of dislocations in metals. Plastic flow, phase transformations, martensitic transformation, and x-ray diffraction identification of metallic phases. Prerequisite: Engineering 312.

465-3 Preparation of Crystalline Materials. Crystalline materials preparation. Phase rule. Crystal growth. Homogeneous and heterogeneous nucleation. Absorption. Impurities, rate of crystallization. Preparative crystallization. Twinning. Spiral growth theory Recrystallization. Perfection of crystalline materials. The solid as an imperfect body. Isomorphic substitution. Composition disorder. Electron holes and traps. Diffusion. The role of imperfections. Prerequisite: 464.

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.

492-1 to 5 Special Problems in Engineering. Selected engineering topics or problems in (a) Stress Analysis, (b) Fluid Flow Analysis, (c) Structural Engineering, (d) Computational Mechanics, (e) Materials Engineering and (f) Dynamics. Prerequisite: consent of instructor.

504-6 (3, 3) X-Ray Diffraction and the Solid State. (Same as Physics 571.) (a) Diffraction by an arbitrary object in Fourier transform formulation, symmetry properties of scattering functions, the convolution theorem, the Q function or auto convolution, the two repeated Fourier transformations, x-ray diffraction by an atom, by a molecule, by an ideal crystal, and by a finite crystal. Optical transforms: Fraunhofer diffraction of a circular aperture, of a molecule and a crystal of disc like atoms. The Fourier synthesis and the Patterson synthesis. The inverse Fourier syntheses. High speed computations of Fourier transforms and of Fourier series. (b) The Born-Laval theory of temperature diffuse scattering of x-rays; determination of elastic constants, dispersion relations of frequencies and velocities, interatomic force constants and elastic vibrational spectrum. Determination of Debye characteristic temperatures from the inversion phenomenon of one-phenon scattering. The Difference Fourier Transform approach. The use of optical diffractometry and optical convolution in the interpretation of imperfect crystals. Prerequisite: 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. Piroelectricity and piromagnetism. 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.

512-3 Introduction to Theoretical Elasticity. Tensor analysis in curvilinear coordinates, definitions of stress and strain, equations of elasticity and examples of their application in one and two dimensions. Prerequisite: 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 Lagally 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.

515-2 Wave Motion. Wave motion in strings and bars. Surface waves in liquids and solids. Sound waves, seismic waves. Method of characteristics and Fourier methods. Prerequisite: consent of instructor.

518-3 Introduction to Turbulence. Application of the basic equations of motion to turbulent flow problems. Reynolds equations; turbulence energy equations; description of the structure of turbulence; correlation and spectrum functions, macro, micro, and time scales; phenomenological theories; free shear and wall shear flows. Hot-wire anemometry; Laser Doppler anemometry. Prerequisite: 414 or equivalent or consent of instructor.

540-2 Elastic Stability. Bending of beam columns under simultaneous action of axial and lateral loads; buckling of compressed bars, frames, rings and arches; lateral buckling of beams; torsion of I beams; buckling of thin plates. Prerequisite: 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.

544-3 Advanced Design of Reinforced Concrete. Torsion. Yield-line theory. Columns in biaxial bending. Continuous beams and frames. Arch and shell roofs. Prestressed concrete. Prerequisite: 444 or consent of instructor.

550-3 Advanced Compressible Fluid Flow. Multidimensional compressible flow. Linearized equations of motion. Method of characteristics. Rarified gas dynamics. Hypersonic flow. Transonic flow. Prerequisite: 417 or equivalent.

561-3 Intermediate Vibrations. Lagrangian equations for several degrees of freedom, methods of finding natural frequencies, matrix methods, applications. Prerequisite: 441 or equivalent.

580-1 to 4 Seminar. Collective and individual study of selected issues and problems relating to various engineering areas. Prerequisite: graduate standing.

592-1 to 4 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.

599-1 to 6 Thesis.

Thermal and Environmental Engineering

Graduate work in the Department of Thermal and Environmental 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.

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 Intermediate Heat Transfer. Analysis of forced convective momentum and heat exchange in tubes and over surfaces. Applications to heat transfer equipment design and processes. Prerequisite: Engineering 302.

404-3 Thermal Systems Optimization. Simulation and optimization of thermal energy conversion systems based on principles of thermodynamics, heat transfer, and fluid mechanics. Mathematical modeling of the performance of turbines, pumps, fans, mass and heat exchangers, etc., from analytical predictions and experimental results. Stochastic treatment of experimental data. Application of the principal optimization methods encountered in engineering practice. Prerequisite: Engineering 302, 361.

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 Conserving Systems.** Criteria for selecting alternative energy systems: amount of energy resources; overall efficiency of available energy utilization; effects of legal, societal, environmental and economic constraints upon the use of energy systems. Application of these criteria to systems utilizing renewable versus non-renewable energy sources. Emphasis on analysis and engineering design of energy conserving systems. Prerequisite: Engineering 302 and Engineering 361 or consent of instructor.
- 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 for students in thermal and environmental engineering option. Prerequisite: 314.
- 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.
- 417-1 Water Quality Laboratory.** Measurements of water quality parameters performed. Use of modern instrumental techniques demonstrated. Safety glasses are required. 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.
- 423-3 Waste Heat Management.** Energy sources and waste heat produced in their utilization. Management of heated surface water effluents to minimize their ecological impact; chemical, physical, and biological. Methods of waste heat disposal from electric power plants. Selection and design of waste heat disposal system. Prerequisite: 314, Engineering 300 or consent of instructor.
- 435-3 Heat and Mass Transfer Processes.** Review of single phase and two phase heat transfer. Heat exchanger design. Mass transfer principles and processes. Processes involving simultaneous heat and mass transfer. Prerequisite: 302.
- 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.** Mechanism of heat, mass, and momentum transport on both molecular and continuum basis. Estimation of transport properties. Generalized transport equations in one or three-dimensional systems. Analogy of mass, heat, and momentum transfer. Macroscopic balances, simultaneous mass, and heat transfer. Prerequisite: 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.
- 510-3 Solid Waste Collection and Disposal.** Basic concepts and theory of solid waste collection and disposal systems.
- 515-3 Advanced Biological Treatment Processes.** The biochemical and microbial aspects of converting substrate to bacterial cell mass or products and its use in various phases of industry (both fermentation and wastewater treatment). Design of activated sludge and trickling filter plants from lab data obtained on explicit wastes from both industry and municipalities. Prerequisite: 415.
- 516-3 Water Resources Management.** Water quality factors and control methods. Technical, economic, social, and legal aspects concerned with implementation of various engineered systems for water quality management. Case studies. Prerequisite: 415.
- 517-3 Industrial Waste Treatment.** Theories and methods of treating industrial wastes. Case studies of major industrial waste problems and their solutions. Prerequisite: 415.
- 525-3 Small Particle Phenomena.** Small particle formation, behavior, properties, emission, collection, analysis, and sampling. Includes atomization, combustion, transport of suspensions and sols, filtration, light scattering and movement patterns of mono and polydisperse particles and use of a device to measure size, size distribution, and one other physical property of an aerosol. Prerequisite: graduate standing.
- 531-4 Reaction Engineering and Rate Processes.** Chemical kinetics of homogeneous

and heterogeneous reactions, kinetic theories, mechanism and mathematical modeling. Reactor design. Design of multiple reactions; temperature and pressure effects. Nonisothermal and nonadiabatic processes. Non-ideal reactors. Prerequisite: 435.

532-3 Separation Processes and Equilibrium Operations. Phase equilibrium, multi-stage calculations, graphical methods, unsteady-state stagewise operations. Multicomponent systems. Rate separation processes. Applications in processing industry. Prerequisite: 435.

580-1 to 4 Seminar. Collective and individual study of issues relating to thermal and environmental engineering. Four hours maximum course credit.

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 chairman.

599-1 to 6 Thesis. Six hours maximum course credit.

Engineering Biophysics

492-1 to 5 (1 per semester) Colloquy in Engineering Biophysics I. Discussion of topics related to engineering biophysics; guest lecturers, field trips. Offered in spring semesters only. Required for undergraduate engineering biophysics majors. Mandatory Pass/Fail.

592-1 to 3 (1 per semester) Colloquy in Engineering Biophysics II. Discussion of topics related to engineering biophysics; guest lecturers, field trips. Offered in spring semesters only. Required for graduate students majoring in engineering biophysics. Graded *S/U* only.

598-1 to 6 Internship in Engineering Biophysics. The fifth year in the engineering biophysics program emphasizes course in physiology, psychology, and speech pathology and audiology. Those studies provide a basis for the internships in selected hospitals and in laboratories in industry and government. The internship is a requirement for completing the graduate program and might well be accomplished in the summer session of the graduate year.

599-1 to 6 Thesis.

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 \$10.00 to \$25.00.

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.

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.

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. (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: 313b, 318b, 424a.

426-4 (2, 2) Photogrammetry. (a) Cameras and photography; flight planning; mathematical principles of vertical and tilted aerial photographs, ground control methods; extension of control; stereoscopy and parallax; basic instruments, stereo plotters, and latest tilted photographs; stereoscopic plotting instruments; principles and use of oblique photography; analytic photogrammetry and new concepts. Laboratory. Prerequisite: 426a or consent of instructor.

437-6 (3, 3) Communications Systems Technology. (a) Radio-frequency transmission-line theory. Electromagnetic fields in rectangular and circular waveguides. Laboratory. Prerequisite: 304b. (b) Communication systems with a unified treatment of various types of

transmission systems with emphasis on the role of system bandwidth and noise in limiting the transmission of information. Laboratory. Prerequisite: 403a, 437a.

438-8 (4, 4) Design of Control and Digital Systems. (a) Fundamentals of control systems; equations of electrical, mechanical, hydraulic, and thermal systems; applications of Laplace transforms, transfer functions, block diagrams and flowgraphs. Computer implemented graphical analysis and design methods: root locus, frequency response, Nyquist diagrams, and compensator design. Continuous-systems simulation laboratory. Prerequisite: 304b, Engineering 222. (b) Design of digital systems; logic operations; number systems and applications. Digital systems simulation laboratory. Prerequisite: Engineering 222.

439-3 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: 438B 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

400-3 Introduction to English Linguistics. Methods of structuralizing: phonetics, phonemics, morphemics, syntax. Especially recommended for students preparing to teach English to native speakers. Elective Pass/Fail.

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. Elective Pass/Fail.

404-3 Middle English Literature Excluding Chaucer. Elective Pass/Fail.

405-3 Middle English Literature: Chaucer. Elective Pass/Fail.

412-3 English Non-Dramatic Literature: The Renaissance. Elective Pass/Fail.

413-3 English Non-Dramatic Literature: The Restoration and Earlier Eighteenth Century. Elective Pass/Fail.

414-3 English Non-Dramatic Literature: The Later Eighteenth Century. Elective Pass/Fail.

417-3 Black Literature. Studies in American and African Black literature, with major emphasis upon contemporary Black expression. Elective Pass/Fail.

421-3 English Romantic Literature. Elective Pass/Fail.

422-3 Victorian Poetry. Victorian poets: Tennyson, Browning, Arnold, and other poets in England. Elective Pass/Fail.

423-3 Modern British Poetry. Elective Pass/Fail.

425-3 Modern Continental Poetry. Representative poems by major 20th century poets of France, Italy, Germany, Spain, Russia, and Greece. Elective Pass/Fail.

426-3 American Poetry to 1900. Trends in American poetry to 1900 with a critical analysis of the achievement of the more important poets. Elective Pass/Fail.

427-3 American Poetry from 1900 to the Present. The more important poets since 1900. Elective Pass/Fail.

436-3 to 9 (3 per topic) Major American Writers. Significant writers of fiction and nonfictional prose from the Puritans to the 20th Century. May be repeated only if topic varies, and with consent of department. Elective Pass/Fail.

438-3 Intellectual Backgrounds of American Literature. The relationship of basic ideas in American to American literature. Elective Pass/Fail.

445-3 Cultural Backgrounds of Western Literature. A study of ancient Greek and Roman literature, Dante's *Divine Comedy*, and Goethe's *Faust*, as to literary type and historical influence on later Western writers. Elective Pass/Fail.

451-3 Eighteenth Century English Fiction. Defoe through Jane Austen. Elective Pass/Fail.

452-3 Nineteenth Century English Fiction. Victorian novel: 1830-1880. Elective Pass/Fail.

453-3 Modern British Fiction. Elective Pass/Fail.

455-3 Modern Continental Fiction. Selected major works of European authors such as Mann, Silone, Camus, Kafka, Malraux, Hesse. Elective Pass/Fail.

458-3 American Fiction to the Twentieth Century. The novel in America from its beginnings to the early 20th Century. Elective Pass/Fail.

459-3 American Fiction of the 20th Century. Trends and techniques in the American novel and short story since 1914. Elective Pass/Fail.

460-3 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. Elective Pass/Fail.

- 462-3 English Restoration and 18th Century Drama.** After 1660, representative types of plays from Dryden to Sheridan. Elective Pass/Fail.
- 464-3 Modern British Drama.** Elective Pass/Fail.
- 465-3 Modern Continental Drama.** The continental drama of Europe since 1870; representative plays of Scandinavia, Russia, Germany, France, Italy, Spain, and Portugal. Elective Pass/Fail.
- 468-3 American Drama.** The rise of the theater in America, with readings of plays, chiefly modern. Elective Pass/Fail.
- 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. Elective Pass/Fail.
- 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. Elective Pass/Fail.
- 484-3 Non-Print Media and English.** Theory and application of film and other nonprint 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.**
- 491-3 Expository Technical Writing.** An all-university course designed to teach advanced academic and professional (non-fictional) writing skills. Prerequisite: GSD 117, 118, or 119, or equivalent. Elective Pass/Fail.
- 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. Elective Pass/Fail.
- 493-3 to 9 (3 per topic) Special Topics in Literature and Language.** Topics vary and are announced in advance; both students and faculty suggest ideas. May be repeated as the topic varies. Prerequisite: consent of instructor. Elective Pass/Fail.
- 495-3 Literary Criticism.** Includes both history of criticism and modern criticism. Open only to seniors and graduate students. Elective Pass/Fail.
- 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.
- 500-2 Materials and Methods of Research in Literature.**
- 501-3 Old English Grammar.**
- 502-3 Beowulf.**
- 503-3 Old Norse.**
- 504-3 to 9 (3 per topic) Studies in Middle English Literature.** May be repeated only if the topic varies, and with consent of the department.
- 505-3 to 9 (3 per topic) Studies in Chaucer.** May be repeated only if the topic varies, and with consent of the department.
- 511-3 to 9 (3 per topic) Studies in Sixteenth Century English Non-Dramatic Literature.** May be repeated only if the topic varies, and with consent of the department.
- 512-3 to 9 (3 per topic) Studies in Seventeenth Century English Non-Dramatic Literature.** May be repeated only if the topic varies, and with consent of department.
- 513-3 to 9 (3 per topic) Studies in English Literature of the Restoration.** May be repeated only if the topic varies, and with consent of the department.
- 514-3 to 9 (3 per topic) Studies in Eighteenth Century English Literature.** May be repeated only if the topic varies, and with consent of the department.
- 518-3 to 9 (3 per topic) Studies in British Literature, 1885 to 1914.** May be repeated only if the topic varies, and with consent of department.
- 519-3 to 9 (3 per topic) Studies in British Literature since 1914.** May be repeated only if the topic varies, and with consent of department.
- 521-3 to 9 (3 per topic) Studies in English Romantic Writers.** May be repeated only if the topic varies, and with consent of department.
- 522-3 to 9 (3 per topic) Studies in Victorian Poets.** May be repeated only if the topic varies, and with consent of department.
- 524-3 Studies in the Metaphysical Poets.**
- 535-3 to 9 (3 per topic) Studies in American Transcendentalism.** May be repeated only if the topic varies, and with consent of department.
- 536-3 to 9 (3 per topic) Studies in Early Nineteenth Century American Writers.** May be repeated only if the topic varies, and with consent of the department.

- 537-3 to 9 (3 per topic) Studies in Later Nineteenth Century American Writers.** May be repeated only if topic varies, and with consent of department.
- 538-3 to 9 (3 per topic) Studies in Twentieth Century American Writers.** May be repeated only if the topic varies, and with consent of department.
- 543-3 to 9 (3 per topic) Studies in Victorian Non-Fiction Prose.** May be repeated only if the topic varies, and with consent of department.
- 552-3 to 9 (3 per topic) Studies in the Victorian Novel.** May be repeated only if the topic varies, and with consent of department.
- 560-3 to 9 (3 per topic) Studies in the English Renaissance Drama.** May be repeated only if the topic varies, and with consent of department.
- 571-3 to 9 (3 per topic) Studies in Shakespeare.** May be repeated only if the topic varies, and with consent of 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.
- 580-3 Traditional Themes in Literature.**
- 581-3 to 9 (3 per topic) Problems in Teaching English.** May be repeated only if the topic varies, and with consent of department.
- 585-2 Teaching College Composition.**
- 593-3 to 9 (3 per topic) Special Topics in Literature and Language.** May be repeated only if the topic varies, and with consent of 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 Stylistics.** (Same as Linguistics 596.) This course defines style and its workings throughout literary history, applies the methods of modern analyses to literary works in English, shows how natural and artificial modes (genre and period definitions, metre, etc.) relate to literary artifacts and to the situation of the work of art vis-a-vis the civilization that engendered it.
- 600-1 to 36 (1 to 16 per semester) Dissertation.**

Foreign Languages and Literatures

- 436-3 Methods in Teaching Modern Foreign Languages.** Survey of general principles of second-language teaching, based upon sights 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 modern foreign languages in secondary schools. Prerequisite: concurrent or prior enrollment in 300-level course in French, German, Russian, or Spanish. Elective Pass/Fail.
- 437-1 to 6 Workshop in High School Foreign Language Instruction.** Familiarizes high school teachers with recent curricular developments in foreign language teaching with emphasis on practical classroom application of instructional innovations. Prerequisite: 436 or consent of instructor. Elective Pass/Fail.
- 506-1 to 4 Research Problems — French.** Individual research on a literary or linguistic problem involving original investigation in areas not covered by seminars or thesis. Two hours may be used for a research paper for non-thesis programs.
- 507-1 to 4 Research Problems — German.** Individual research on a literary or linguistic problem involving original investigation in areas not covered by seminars or thesis. Two hours may be used for a research paper for non-thesis programs.
- 508-1 to 4 Research Problems—Russian.** Individual research on a literary or linguistic problem involving original investigation in areas not covered by seminars or thesis. Two hours may be used for a research paper for non-thesis programs.
- 509-1 to 4 Research Problems—Spanish.** Individual research on a literary or linguistic problem involving original investigation in areas not covered by seminars or thesis. Two hours may be used for a research paper for non-thesis programs.
- 535-2 Critical Theory.** Theories of literature and theories underlying literary criticism, taken logically rather than chronologically. Extensive reading, in the original language whenever possible, of both primary statements and exemplificative documents.
- 566-2 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.
- 567-2 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.
- 568-2 Bibliography and Research Techniques—Russian.** Bibliography and research

methods in the target language and its culture. Introduction to the use of the chief reference works in the humanities and social sciences as they deal with areas in which the target language is spoken.

569-3 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.

410-3 The Linguistic Structure of Chinese. (Same as Linguistics 411.) Phonology and syntax of Mandarin Chinese. Principal phonological features of major Chinese dialects. Special emphasis on the contrastive analysis between Mandarin Chinese and English. Theoretical implications of Chinese syntax for current linguistic theories. Prerequisite: one year of Chinese or introduction to linguistics. Elective Pass/Fail.

Classical Studies

No graduate program is offered through the Classical Studies section. Four-hundred-level courses in this section may be taken for graduate credit unless otherwise indicated in the course description.

405-2 Greek Literature in Translation. Reading and analysis of selected Classical Greek author(s), genre(s), theme(s), such as the role of woman, the social life of the ancient Greeks', etc. Students taking the course for graduate credit will do a critical study of one aspect. Elective Pass/Fail.

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. Elective Pass/Fail.

441-3 Themes in Greek Tragedies and the New Testament. (Same as Religious Studies 441.) Greek tragedies and New Testament passages from the Synoptic Gospels and the Letters of Paul showing similarities and differences in their treatment of such themes as freedom, law, love, and justice. Not for graduate credit. Prerequisite: 270, 332 or 405 or GSC 330, or 231 and GSC 217 or consent of instructor. Elective Pass/Fail.

496-2 to 8 (2 to 4, 2 to 4) Independent Study in Classical Studies 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 Classical Studies Program (Anthropology, Classical Studies, History, Philosophy, or Religious Studies). At end of advanced level work, student will submit a research paper. Not for graduate credit. Prerequisite: consent of instructor and Classical Studies section head. Elective Pass/Fail.

French

Courses numbered 288 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.

288-6 (3, 3) French as a Research Tool. Reading of French texts with emphasis on grammar as a tool for reading comprehension; development of reading skills in various fields; humanities, social studies, science; development of interpretive and translation skills in student's own discipline. With consent of student's department, 288b satisfies the graduate school requirement for foreign language as a research tool. Students who have had one year of college French or the equivalent would normally enroll in 288b. This course is intended for graduate students. Undergraduates who wish to enroll are encouraged to consult with the instructor of the course.

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. Elective Pass/Fail.

411-3 Contrastive Analysis: French and English. Study of the phonology, morphology, and syntax of modern spoken and written French, stressing interference areas for English speakers in learning French. Elective Pass/Fail.

412-3 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. Elective Pass/Fail.

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. Elective Pass/Fail.

420-3 Medieval and Renaissance Literature. Study of the origins of French literature emphasizing the *Chanson de Roland*, *Tristan*, other courtly romances, and the lyric poetry of Villon, culminating with an examination of the development of the humanistic ideas and ideals of the French Renaissance. Elective Pass/Fail.

430-4 Baroque and Classicism. An in-depth examination of artistic and social writings of baroque and classical literary figures such as Corneille, Racine, Moliere, La Fontaine, Descartes, Pascal, Mme de LaFayette, La Bruyere, and La Rochefoucauld. Discussion, reports, papers. Elective Pass/Fail.

440-3 Literature of the Enlightenment. Study and discussion of the novel, theater, and philosophic writing of 18th century France as literature and as expressions of the Enlightenment. Major attention given to Montesquieu, Voltaire, Diderot, and Rousseau. Elective Pass/Fail.

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. Elective Pass/Fail.

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. Elective Pass/Fail.

470-3 Backgrounds of French Civilization. A study of the events, figures, and movements in France which have influenced her culture and civilization. Elective Pass/Fail.

475-1 to 3 Travel-Study in France. Travel-study project, planned under supervision of French faculty and carried out in France. Amount of credit depending on scope of study. Elective Pass/Fail.

490-1 to 3 Advanced Independent Study in French. Individual exploration of some question, author, or theme of significance within the field of French literature, language or culture.

501-1 to 3 Seminar on a Selected Topic or Author. Intensive study of one author or topic.

520-1 to 3 Literature of the Middle Ages. A study of selected genres, authors, seen against the background of the political realities and the philosophical currents of the Middle Ages.

530-1 to 3 Literature of the Renaissance. A study of selected authors, literary movements, and expressions of philosophical thoughts of the Renaissance.

536-1 Teaching French at the College Level. Prepares graduate students in French for teaching at the college level. Required of all teaching assistants, in French. May not be counted to satisfy secondary certification requirements.

539-1 to 3 Literature of the 17th Century. Collaborative research in selected works of neo-classical French authors. Lectures, reports, discussions, paper.

540-1 to 3 Literature of the 18th Century. Selected topics, movements, or authors in the literature of the 18th Century.

550-1 to 3 Literature of the 19th Century. Selected topics, movements, or authors in the literature of the 19th Century.

560-1 to 3 Literature of the 20th Century. Study of an author, theme, movement, or critical literary issue of contemporary interest. Topics may range from the Existentialist vision or the Quest for Self to the novel of commitment of the New Novel.

599-1 to 6 Thesis.

German

Courses numbered 288 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.

288-6 (3, 3) German as a Research Tool. (a) Practice in recognizing and interpreting most frequent grammatical patterns and basic vocabulary necessary for reading knowledge of German; (b) concentrated training in translation of specialized literature in student's discipline. With consent of student's department, 288b satisfies the graduate school requirement for foreign language as a research tool. Students who have had one year of college German or the equivalent would normally enroll in 288b. This course is intended for graduate students. Undergraduates who wish to enroll are encouraged to consult with the instructor of the course.

- 401-3 Survey of German Literature Beginnings to 1780.** Readings, lectures, discussions, reports, and research projects on major German figures and movements from the Middle Ages through the Enlightenment. Prerequisite: 330. Elective Pass/Fail.
- 412-3 Contrastive Analysis: German and English.** Contrastive study of German and English, in terms of speech sounds and grammatical structures. Designed particularly to help teachers of German diagnose and remedy the problems encountered by English speaking students of German. Prerequisite: 320b or consent of instructor. Elective Pass/Fail.
- 413-3 History of the German Language.** Survey of the development of German from its beginnings to the present day, with attention to dialects and "daughter languages" (including Dutch, Yiddish, Afrikaans). Elective Pass/Fail.
- 416-3 Fourth Year Grammar and Composition.** Designed to improve language skills beyond the level of 320. Extensive practice in spoken and written German. Prerequisite: 320b or consent of instructor. Elective Pass/Fail.
- 438-1 Diction for Teachers of German.** Designed to correct residual pronunciation deficiencies for students planning to become teachers of German. While improving their own pronunciation, students are also made aware of the practical techniques of teaching correct German pronunciation to Americans. Elective Pass/Fail.
- 445-4 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. Elective Pass/Fail.
- 450-3 19th Century German Literature.** German literature from the late romanticists to the naturalists and impressionists. Conducted in German. Prerequisite: 330 or equivalent. Elective Pass-Fail.
- 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. Elective Pass/Fail.
- 485-2 German Lyric Poetry.** Development of German lyric poetry from Klopstock and Burger to the present. Conducted in German. Prerequisite: 330 or equivalent. Elective Pass/Fail.
- 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. Elective Pass/Fail.
- 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 repeated 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.**

Greek

No graduate program in Greek is offered through the Classical Studies section. Four-hundred-level courses in this section may be taken for graduate credit unless otherwise indicated in the course description.

415-2 to 6 (2 to 4 per semester) Readings from Greek Authors. Reading and interpretation of works in Greek not covered in other courses. Maximum of six semester hours toward program. Not for graduate credit. Prerequisite: 201 or equivalent. Elective Pass/Fail.

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. Elective Pass/Fail.

Latin

No graduate program in Latin is offered through the Classical Studies section. Four-hundred-level courses in this section may be taken for graduate credit unless otherwise indicated in the course description.

Courses numbered 288 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.

288-6 (3, 3) Latin as a Research Tool. Intensive course designed to impart grammar and vocabulary necessary for a reading knowledge of the language. Also to serve as a review for people who have had some Latin. Development of interpretive and translation skills in student's own discipline. With consent of student's department, 288b satisfies the graduate school requirement for foreign language as a research tool. Open to graduates and undergraduates.

415-2 to 6 (2 or 3, 2 or 3, 2 or 3) Readings from Latin Authors. Flexible reading program of works not covered in other courses. Not for graduate credit. Prerequisite: 201 or equivalent. Elective Pass/Fail.

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 288 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, no in addition, to their graduate program. Students will not receive graduate credit for courses numbered below 400.

288-6 (3, 3) Russian as a Research Tool. Reading of Russian articles with emphasis on grammar as a tool for reading comprehension; development of reading skills in various fields: humanities, social studies, science; development of interpretive and translation skills in student's own discipline. With consent of student's department, 288b satisfies the graduate school requirement for foreign language as a research tool. Students who have had one year of college Russian or the equivalent would normally enroll in 288b. This course is intended for graduate students. Undergraduates who wish to enroll are encouraged to consult with the instructor of the course.

411-3 Russian Stylistics. Writing style in Russian and its application to the development of skill in written expression. Prerequisite: 310 or 320 or equivalent. Elective Pass/Fail.

415-3 Russian Linguistic Structure. Structural analysis of present-day Russian with special attention to morphology and syntax. Elective Pass/Fail.

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 278 or equivalent. Elective Pass/Fail.

465-3 Soviet Russian Literature. Major fiction writers and literary trends since 1917. Lectures, readings, and reports. Prerequisite: 310 or equivalent. Elective Pass/Fail.

470-3 Soviet Civilization. Present day political, economic, and social institutions of the

Soviet Union. Readings from contemporary news media. No previous knowledge of Russian required. Elective Pass/Fail.

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. Elective Pass/Fail.

480-4 Russian Realism. Authors in 19th century Russian literature. Special attention to stylistic devices. Lectures, readings, and individual class reports. Prerequisite: 310 or equivalent. Elective Pass/Fail.

485-3 Russian Poetry. A study of literary trends and representative works of Russian poets. Prerequisite: 310 or equivalent. Elective Pass/Fail.

490-1 to 3 Independent Study. Directed independent study in a selected area. Prerequisite: consent of the Russian section head. Elective Pass/Fail.

501-2 Seminar on a Selected Russian Author. Intensive study of one author, his life, his work, and his 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.

514-3 History of the Russian Language. A survey of the phonological, morphological, and syntactical changes from the period of the common Slavic to the present Russian literary language.

599-1 to 6 Thesis.

Spanish

Courses numbered 288 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.

288-6 (3, 3) Spanish as a Research Tool. (a) Basic grammatical structure and vocabulary necessary to a reading knowledge of the language; (b) finalizes translation skills in the student's discipline. With consent of student's department, 288b satisfies the graduate school requirement for foreign language as a research tool. Students who have had one year of college Spanish or the equivalent would normally enroll in 288b. This course is intended for graduate students. Undergraduates who wish to enroll are encouraged to consult with the instructor of the course.

410-3 Romance Philology. Historical and comparative study of the major Romance languages: their phonology, morphology, and syntax. Elective Pass/Fail.

412-3 Advanced Grammar and Composition. Designed to improve language skills beyond the level of 320. Elective Pass/Fail.

415-3 The Linguistic Structure of Spanish. Phonology and grammatical structure of Spanish. Examination of the features of the principal dialects. Required of all majors. Elective Pass/Fail.

417-3 History of the Spanish Language. Survey of internal and external history, from Vulgar Latin to Modern Spanish. Elective Pass/Fail.

430-3 The Golden Age: Drama. Plays of Lope de Vega, Calderón, Tirso de Molina, and others. Elective Pass/Fail.

431-3 Cervantes. *Don Quixote*. Elective Pass/Fail.

434-2 Colonial Literature in Spanish America. Study of the literature of Spanish America before 1825. Elective Pass/Fail.

450-3 Spanish Literature of the 19th Century. Study of significant literary works of the periods of Romanticism and Realism in Spain. Elective Pass/Fail.

460-4 Spanish Literature of the 20th Century. The main currents and outstanding works in the literature of Spain since 1900. Elective Pass/Fail.

485-4 (2, 2) The Spanish American Short Story. Survey of the genre in Spanish America. (a) From the beginnings through the 19th Century. (b) The 20th Century. Elective Pass/Fail.

486-2 Spanish American Drama. A survey of the development of the genre from the earliest times to the present. Elective Pass/Fail.

487-4 (2, 2) The Spanish American Novel. Survey of the genre in Spanish America. (a) From the beginnings to 1940. (b) From 1940 to the present. Elective Pass/Fail.

488-3 Spanish American Poetry from Modernism to the Present. Survey of the genre from the late 19th century up to the present. Elective Pass/Fail.

490-1 to 3 Readings in Spanish. Directed independent readings in a selected area. Prerequisite: consent of department. Elective Pass/Fail.

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.
- 530-2 to 4 (2, 2) Spanish Literature of the Renaissance and Golden Age.** Intensive study of literary movement, trend, genre, or author of the period, as specified by the topic to be announced for each semester.
- 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.
- 540-2 to 4 (2, 2) 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.
- 560-2 to 4 (2, 2) 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.**

Forestry

Courses in this department may require the purchase of supplemental materials. Field trips are required for certain courses.

- 401-3 Fundamentals of Environmental Education.** (See Agriculture 401.)
- 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.
- 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: 410.
- 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. Prerequisite: 301.
- 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: Agricultural Industries 204 or Economics 215.
- 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 \$25.00 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 organization, and marketing research as influences on the marketing of lumber, wood products, pulp, and paper. Taught in alternate years. Prerequisite: 411 or consent of instructor.
- 420-3 Park and Wildlands Management.** The management of state and federal parks

and recreation areas. A systems approach toward management and decision-making will be emphasized. Requires supplemental purchases of approximately \$5.00 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: 350, 450 or consent of instructor.

422T-2 Park and Wildlands Management—Field Trip. A study of park conditions, visitors, and management practices at selected county, state, and federal park systems in the United States. Course requires a field trip and supplemental purchases costing approximately \$110.00 per student. Prerequisite: 320 or 320C and consent of instructor.

423-3 Environmental Interpretation. (See Agriculture 423.)

430-3 Wildland Watershed Management. Fundamentals of hydrology and water management for wildland watersheds. Emphasis is placed upon the effects of forest management alternatives on the quality, quantity, and timing of water yield. 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. Field trip cost—maximum \$20. Prerequisite: 300 or consent of instructor.

452-2 Forest Soils. Land forms, their geology, and the soils developed on them; the chemical, physical, and biological properties of forest soils; soil classification, and field interpretation as related to forest resources management. Prerequisite: 240 or Plant and Soil Science 240.

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: 300, 310, 313, 312, 430, or 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.

492-1 to 4 Special Studies for Honor Students. Research and individual problems in forestry. Prerequisite: consent of chairman and 3.0 minimum grade point average.

494-1 to 6 Practicum. Supervised practicum experience in professional setting. Emphasis on administration, supervision, teaching, and program leadership in community, school, park and forest, institution, and other recreation settings. Prerequisite: consent of instructor.

500-2 Principles of Research. Research philosophy, approaches to research; theory, hypotheses inference, and predicting; problem identification, project development and organization; methods of data collection, analysis, and presentation; drawing conclusions and organizing results. Prerequisite: four hours in statistical methods or consent of instructor.

501-1 Graduate Seminar. Presentation and critiques of current research project of faculty, graduate student, and selected resource persons.

511-2 Advanced Forest Resources Economics. Application of microeconomic, macroeconomic and capital theory to forest resource problems; introductory econometric methods; long range supply and demand projections; international forest economics and policy problems decision theory in forest resource management. Offered alternate years. Prerequisite: 411 or equivalent or consent of instructor.

512-2 Tree Selection and Breeding. Quantitative methods of describing variation patterns of trees, testing genetic and environmental effects and interactions, and evaluations of tree improvement program. Prerequisite: 412 or consent of instructor.

516-2 Advanced Forest Management. Case studies in forest land management, management planning, utilizing computer programming, CFI and TSI role in long range management planning. Offered alternate years—odd. Prerequisite: 416, 331, and summer camp or consent of instructor.

520-2 Advanced Park Planning. Study of nature and functions of the recreation environmental planning process in theoretical and policy terms. Types of plans at local, regional, and state levels. Evaluation of different types of planning approaches and their utility in particular situations. Offered alternate years. Prerequisite: 421 or consent of instructor.

521-2 Recreation Behavior in Wildlands Environments. Review of sociological and psychological theories relevant to outdoor recreation planning; management alternatives. Review of current behavior research in outdoor recreation. Application of behavioral concepts to recreation planning and administration. Offered alternate years.

530-2 Forest Site Evaluation. A discussion of the factors affecting site quality and their use in present site evaluation methods. Lectures will draw upon recently published scientific literature as well as forest research data collected and analyzed for southern Illinois forests.

Laboratories will include sampling of forest sites and stands with subsequent analysis of data using graphic and statistical techniques and a computer to develop site evaluation models. Cost \$20.00. 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 are emphasized during laboratory period. Cost: approximately \$15.00. Offered alternate years. Prerequisite: 331 or equivalent.

588-1 to 6 International Graduate Studies. University residential graduate program abroad. Prior approval by the department is required both for the nature of program and the number of hours of credit.

590-1 to 4 Readings in Forest Resources. Intensive consideration is given to current practices and problems in forestry. Prerequisite: consent of instructor.

593-1 to 4 Individual Research. Directed research in selected fields of forestry.

599-1 to 6 Thesis. Minimum of five hours to be counted toward a master's degree.

Geography

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. Elective Pass/Fail.

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. Elective Pass/Fail.

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. Elective Pass/Fail.

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. Elective Pass/Fail.

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. Elective Pass/Fail.

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. Elective Pass/Fail.

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: 300 or consent of instructor. Elective Pass/Fail.

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. Elective Pass/Fail.

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. Elective Pass/Fail.

427-3 Environmental Perception and Planning. Deals with a description and assessment of the relevance of normative and descriptive theories of decision-making and theories of choice for public policy and environmental management. Studies of the perception of urban

environments and other landscapes such as wilderness areas, and perception of and human response toward natural hazards will be considered. Prerequisite: 224 or consent. Elective Pass/Fail.

430-3 Theory of Environment. Exploration of the hypothesis that the physical environment works on local hydrology, soils, and natural vegetation, agriculture, and landforms, through energy and moisture exchanges. Emphasis on model building for comparison of subsystems, to rate effectiveness of contrasting environments, and to project these consequences to environmental management questions. Prerequisite: 302 or consent. Elective Pass/Fail.

431-2 Medical Geography. Deals with the distribution of disease and attempts to use the operational concepts of human ecology as a point of departure. A brief historical outline and an introduction to public health, epidemiology, and related fields is provided. Problems of communicable and chronic diseases, nutritional deficiency, geochemical relations, biometeorology and medical climatology, environmental pollution, and seasonal disease calendars are emphasized. Taught by Department of Geography staff. Prerequisite: 300 or consent. Elective Pass/Fail.

432-4 Urban Climatology. 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 Man's effects concern city climates mainly. Charges not to exceed \$5 for field trips. Prerequisite: 302 or 430 or consent. Elective Pass/Fail.

432B-4 Hydrologic Climatology. 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. Elective Pass/Fail.

433-3 Advanced Physical Geography. Topics may include landforms, climate, soil, or water. Varies with the interest of the instructor. Prerequisite: 302 or consent. Elective Pass/Fail.

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, \$5 for supplies. Prerequisite: GSA 330 or consent of instructor. Elective Pass/Fail.

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. Elective Pass/Fail.

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. Elective Pass/Fail.

470-6 to 9 (3, 1 or 2, 2 to 4) Urban Planning. (Same as Political Science 447). (a) Planning concepts and methods. Charges not to exceed \$8 for field trips. (b) Field problems. (c) Planning and public administration internship (for undergraduate credit only). Prerequisite: consent of department. Elective Pass/Fail.

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. Elective Pass/Fail.

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. Elective Pass/Fail.

490-2 to 4 Readings in Geography. Supervised readings in selected subjects. Prerequisite: geography major, advanced standing. Elective Pass/Fail.

500-4 Principles of Research. Meaning, philosophy, science, reasoning, creative endeavor, problem identification in research, research methodology, preparation of project statements, analysis, and results in multi-disciplinary approach with appropriate faculty participation. Prerequisite: graduate admission.

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 factor analysis. Examples and demonstrations of each method; basic introduction to computer applications of multivariate analyses. Prerequisite: 410.

- 511-2 Philosophy of Geography.** The nature of geography. Current trends in the field, present day geographers, and schools of thought. Geography's place among the disciplines. Prerequisite: graduate standing.
- 514-2 College Teaching of Geography.** Prerequisite: graduate standing.
- 520-2 to 4 Seminar in Physical Geography.** Prerequisite: graduate standing.
- 521-2 to 4 Seminar in Economic Geography.** Prerequisite: graduate standing.
- 522-4 Economics in Geography and Planning II.** (Same as Economics 525.) Public expenditure criteria based on free-market allocation, public, private, and merit goods and services, and related planning; expenditure criteria based on comprehensive plans; expenditure criteria and planning in the absence of general optimality; multiple objectives, measurement of benefits and costs, shadow prices, choice of techniques in planning; consideration of uncertainty. Critical evaluations of applied work and models of development projects, and programs, by students. Prerequisite: 422 or consent of the instructor.
- 524-2 to 4 Seminar in Cultural Geography.** Prerequisite: graduate standing.
- 527-2 to 4 Seminar in Urban and Regional Planning.** Prerequisite: graduate standing.
- 570-2 to 4 Planning Internship.** Planning internship with city or regional planning agency or private planning firm. Prerequisite: 470a or consent of department.
- 591-2 to 4 Independent Studies in Geography.** Prerequisite: graduate standing.
- 593A-2 to 24 (2 to 6 per semester) Research in Physical Geography.** Prerequisite: 520.
- 593B-2 to 24 (2 to 6 per semester) Research in Economic Geography.** Prerequisite: 521.
- 593C-2 to 24 (2 to 6 per semester) Research in Regional Geography.** Prerequisite: graduate standing.
- 593D-2 to 24 (2 to 6 per semester) Research in Cultural Geography.** Prerequisite: 524.
- 596-2 to 4 Field Course.** Prerequisite: graduate standing.
- 599-2 to 6 Thesis.** Prerequisite: graduate standing.
- 600-1 to 32 (1 to 16 per semester) Dissertation.** Prerequisite: graduate standing.

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.

400-2 Earth Science Seminar. Designed to integrate the basic concepts of earth science gained through courses taken in several departments. Focus on one or more local problems such as development and management of Cedar Creek Reservoir. Prerequisite: GSA 110, upper class standing or consent of department. Elective Pass/Fail.

414-1 to 2 Paleobotany. (See Botany 414.) Elective Pass/Fail.

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. Elective Pass/Fail.

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. Elective Pass/Fail.

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. Elective Pass/Fail.

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. Elective Pass/Fail.

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. Elective Pass/Fail.

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. Elective Pass/Fail.

428-3 Paleocology and Environments of Deposition. Characteristics, distribution, and classification of recent and ancient environments. Criteria for recognizing ancient environments. Sedimentological and paleocological approaches. Recognition of ancient en-

vironments and environmental associations. Laboratory. Field trips required. Prerequisite: 425, 325 or concurrent enrollment. Elective Pass/Fail.

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. Elective Pass/Fail.

435-3 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. Elective Pass/Fail.

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. Elective Pass/Fail.

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. Elective Pass/Fail.

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.

449-1 to 2 Internship. Credit for professional experience in the geological sciences. Arrangements made with chairman. Prerequisite: advanced standing. Elective Pass/Fail.

450-2 Introduction to Field Geology. Introduction to field techniques, principles of geologic mapping and map interpretation. Field trip fee \$5.00. Prerequisite: 302, 315 or concurrent enrollment. Elective Pass/Fail.

454-6 Field Geology. Advanced field mapping in the Rocky Mountains, including problems in stratigraphy, structure, petrology, paleontology, geomorphology, and economic geology. Transportation fee \$100.00, supplies \$6.00. Prerequisite: 302, 315; 450 recommended. Elective Pass/Fail.

455-3 Engineering Geology. (Same as Engineering 455.) An examination of problems posed by geology in the design, construction, and maintenance of engineering works. Topics studied include ground water, land subsidence, earthquakes, and rock and soil mechanics. One term paper and a field trip required. Prerequisite: 220 or consent. Elective Pass/Fail.

460-3 Geological Data Processing. Computer applications to geological problems including the processing and programming of data and the interpretation and evaluation of results. Lecture, laboratory. Prerequisite: Engineering 222 or Computer Science 202. Elective Pass/Fail.

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 problems only. Prerequisite: 302 or equivalent.

465-3 Evolution of Orogenic Belts. A combination of lectures and seminars in which the structural and petrological development of specific orogenic belts is investigated in detail. Prerequisite: 302, 315 or equivalent. Elective Pass/Fail.

470-3 Earth Science for Teachers. Designed to help each teacher improve knowledge and skills of the earth sciences, develop units, laboratories, and resources for the classroom. Subjects range from rocks and landforms to weather; from local geology to specific resource people. Prerequisite: teaching experience. Elective Pass/Fail.

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. Elective Pass/Fail.

478-3 Environmental Geology. Identification of geologic conditions and processes which affect man's use of the environment: earth materials and structure, climate, water, topography, active geological processes, hazards; impact of extraction, construction, water collection and control, and waste disposal. Introduction to aims and responsibilities of government regulatory agencies, environmental groups and industry. Lecture, laboratory, field trips, individual projects and reports. Prerequisite: 220 or equivalent and advanced standing.

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 ½-day field trips.

482-3 Coal Petrology. Structural features and microscopy of coal seams. Origin and

alteration of coal constituents. Includes field trips, study of coal specimens, and techniques. Prerequisite: 220 and 221 or consent of instructor. Elective Pass/Fail.

484-3 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. Elective Pass/Fail.

500-1 to 2 Teaching for Geology Graduate Students. To help teaching assistants develop skills in conducting laboratory work and leading discussions. One hour required for all teaching assistants in geology. Graded *S/U* only.

510-3 Advanced Sedimentation. Physical processes that govern the erosion, transportation, and deposition of detrital sedimentary particles. Formation and preservation of sedimentary structures. Physical sedimentary processes operative in different non-marine, coastal, and marine environments. Laboratory. Field trips required. Prerequisite: 325.

513-2 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.

516-3 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.

518-3 Clay Mineralogy. Study of the structure, chemistry, origin, and geologic importance of clay minerals. Industrial and other applications of clays. Lecture, laboratory. Prerequisite: 310 or consent.

520-3 Igneous Petrology. Theoretical, experimental, and observational considerations applied to genetic relationships of igneous rocks. Laboratory to utilize the petrographic microscope in studying rocks from igneous terranes. Prerequisite: 315, 415.

521-3 Metamorphic Petrology. Theoretical and experimental approaches to solving problems in metamorphic petrology. Comparative studies between well-known metamorphic provinces. Laboratory to utilize the petrographic microscope in studying rocks from metamorphic terranes. Prerequisite: 315, 415.

522-3 Sedimentary Petrology — Siliciclastics. The petrography and petrology of siliciclastic rocks, emphasizing sandstones. Microscopic studies of composition and components of detrital clastic rocks, their origin, provenance, characteristics, diagenesis, cementation and lithification. Prerequisite: 325 and 415 or consent; 520 or 521 recommended.

523-3 Sedimentary Petrology—Carbonates. The origin, classification, diagenesis, and geochemistry of carbonate rocks, with emphasis on petrographic analysis. Study of recent carbonate depositional environments. Laboratory required. Prerequisite: 325, 418 recommended.

526-3 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.

527-3 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.

529-1 to 3 (1 per topic) Advanced Topics in Applied Invertebrate Paleontology. Lectures, readings, field and laboratory studies, including techniques and quantitative methods of study. Preparation for research in paleontology. Maximum of three hours credit. Topics may include: brachiopods; bryozoans; coelenterates; echinoderms; fossil species and numerical taxonomy; mollusks. Prerequisite: 425 or consent.

535-3 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: 435.

537-3 Applied Seismology. Study of the seismic reflection techniques, including theory and methods of collection and analysis of seismic reflection data, the seismic method, waveform analysis, and digital filtering with computer applications and seismic instrument characteristics. Prerequisite: Mathematics 150 or consent.

538-3 Gravity and Magnetism. Study of gravitational and magnetic methods used for solution of geological problems; topics include fundamental theory of gravitational and magnetic fields of the earth, field operations, data analysis, anomaly separation, and interpretation of data. Prerequisite: Mathematics 150 or consent.

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.

578-3 Fluvial Geomorphology. Detailed study of river processes, landforms, and major concepts related to geology. Flood, drainage basin analysis, and hydraulic geometry. Prerequisite: 374.

579-3 Geomorphology. A study of surficial processes and landforms with emphasis on concepts developed since 1950. Comparison of cyclic and non-cyclic models of landform evolution and detailed analyses of process mechanics. Prerequisite: 374 or consent of instructor.

582-3 Advanced Coal Petrology. Microscopy, source materials, coalification, constitution, and classification of peats, lignites, bituminous coal, anthracite; applications to industrial problems. Prerequisite: 482.

599-1 to 6 Thesis. Minimum of three hours to be counted toward a master's degree.

Guidance and Educational Psychology

Courses in this department may require the purchase of supplemental materials. Field trips are required for certain courses.

412-3 Human Behavior and Mental Health. A study of the principles of human needs, mechanisms of adjustment, and factors and conditions in life that tend to affect mental health. Prerequisite: junior or senior standing.

422-3 Assessment and Classroom Models. Classroom tests, measurement, standardized tests, grading, and the research knowledge in the application of ability grouping, team teaching, open education, and individualization.

442-3 Introduction to Counseling and Guidance Systems. The following topics will be covered: purposes of counseling and guidance; counselor roles in various settings; approaches to counseling; guidance activities; and application of the above.

481-2 to 4 (2, 2) Seminar. Conducted by staff members and distinguished guest lecturers on pertinent topics. Prerequisite: consent of instructor and department.

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.

494A-3 Child Counseling Practicum. A combined seminar, laboratory, and field experience representing the central focus of the program in elementary counseling. Enables the student to practice the role of the counselor under close supervision. During the semester, the student is required to spend 30-50 hours in actual counseling and consulting. Prerequisite: 537 and 3 additional hours from substantive course work in the guidance and counseling program.

494B-3 Adolescent and Adult Counseling Practicum. Practice of counseling skills with an adolescent or an adult population 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 guidance and counseling program.

494C-3 Career Planning Practicum. Supervised experience in handling career development experiences at elementary, secondary, or college levels. Application of theoretical models to program development is stressed, including presentation of relevant lessons, handling of group guidance activities, and conducting individual career development counseling sessions. Intern experience in public school or college settings equal to one day per week is required. Prerequisite: 542 and 3 additional hours from substantive course work in the guidance and counseling program.

494D-3 to 6 (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.

502-3 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. Credit will not be given for both 506 and 502.

506-4 Inferential Statistics. Covers basic descriptive techniques such as central tendency, measures of variability and graphical presentation of data. In addition, hypothesis testing, analysis of variance, nonparametrics and simple linear prediction will be covered.

507-4 Multiple Regression. The general linear model is presented which allows for hypothesis testing including correlational analysis, analysis of variance, and analysis of covariance. Non-linear relationships are presented. Emphasis is placed on testing the stated research hypotheses. Prerequisite: 506.

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 Behaviors at the School Level. Physical, mental, and social growth, affective and cognitive theories, moral and political development, acquisition and utility of language, motivation and memory. The course is to enable a teacher to deal effectively with the affective and cognitive behaviors of school adults and children.

513-3 Psychological Trends in Education. Study of literature from B. F. Skinner, Carl

Rogers, Erik Erickson, Abraham Maslow, John Dewey, Laurence Cremin, Jerome Bruner, Haim Ginott, Clark Moustakas, A. S. Neill, John Holt, Charles Silberman, Thomas Gordon, Jean Piaget, Jerome Kagan, Sigmund Freud, etc., to provide the student with knowledge of contemporary psychological trends in education.

515-3 The Psychological Aspects of Instructional Design. Survey of applications of psychology to the design, delivery, and evaluation of instruction for cognitive and affective learning. Prerequisite: 511.

518-3 Psychology of the Classroom. The course is to develop classroom interpersonal skills such as values clarification, good listening skills, and empathy. Strategies for the resolution of conflicts will be presented and reasons for disruptive behavior will be discussed. Role playing, group processes in the classroom, behavioral modification, and classroom discipline will also be examined.

521-3 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.

530-4 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.

531-3 Principles of Measurement. Intended to provide theoretical principles of measurement which are applicable to both teaching and research. Part of the course will be devoted to current issues in measurement and to practical applications to these theoretical principles.

532-3 Individual Intelligence Theory. Nature and assessment of intellectual behavior with emphasis on the historical, theoretical, and developmental aspects of intelligence. Special attention is given to test standardization and interpretation of the Stanford-Binet and Wechsler Scales.

533-4 Individual Measurement and Practice. Psycho-educational assessment of individual mental factors with attentions to all aspects of administration, scoring, interpreting, and utilizing the results of the Stanford-Binet Intelligence Scale, Wechsler Intelligence Scales for children and the Wechsler Adult Intelligence Scales. Additional charges not to exceed \$12 may be assessed for test kit rentals. Prerequisite: 494d, 532.

537-4 Counseling with Children: Theory, Techniques, and Practice. The foundations and techniques of individual and group counseling in the elementary school, with particular emphasis on theories, operational approaches, tools, and related procedures. Students will be required to practice the techniques and approaches learned.

538-4 Interpersonal Relations: Theory 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. Course requires student participation in laboratory activities and use of tape recorder.

540-3 Problems, Issues, and Trends in School Guidance and 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 ramifications of the trends.

542-4 Career Development Procedures and Practices. For pupil personnel workers, teachers, and administrators to give an orientation to theoretical, economic, and informational aspects of vocational guidance and to provide experiences with using career information in counseling and decision making. Obtaining occupational and information materials for use in guidance and teaching. Taking vocational field trips and field work with children or adolescents will be required. Prerequisite: 412.

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.

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 \$12 may be assessed for test kit rentals. Prerequisite: 533.

547-3 Implementation of Guidance 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 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 guidance work, advanced standing in the counselor education program or equivalency to either of the above.

551-3 The Supervision of Practicum. Doctoral students will: become familiar with models of counseling supervision; practice supervision with master's students; and be acquainted with the research in the counselor training and supervision. Individual and group supervision are provided. Tape recording of supervision sessions is required.

555-3 to 6 (3, 3) Seminar in School Psychology. Major professional issues and responsibilities; the school as a social system; ethical considerations; school related agencies and facilities; and professional organizations. Assists the student to prepare the project proposal required for the specialists' degree. Prerequisite: consent of instructor.

562-6 (3, 3) Human Development in Education. Theories and research evidence regarding child development and behavior are investigated. These considerations focus upon implications for research and educational practices. (a) Childhood. (b) Adolescent.

567-2 to 9 (2 to 6 per semester) Topical Seminar in Educational Psychology. Contemporary topics and problems in the area of educational psychology. Conceptual and empirical activities. Prerequisite: consent of instructor.

568-1 to 12 (1 to 6 per semester) Topical Seminar in Counseling and Guidance. 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.

580-2 to 12 (2 to 6 per semester) Doctoral Seminar in Educational Measurement and Statistics. Topics vary depending upon needs of students and competencies of staff. For example, seminars are held on such topics as factor analysis, program evaluation, scaling techniques, advanced regression analysis. Prerequisite: 507.

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.

599-1 to 6 Thesis. Prerequisite: consent of department.

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

Health Education

400-3 Health Appraisal of School Children. The teacher as a member of the health team in recognizing common health deviations. Emphasis on helping each child realize his full health potential.

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.

407-3 Drug Education. Meets requirements of Illinois state law for education concerning drugs including alcohol for grades K-12. Explores motivations behind use and abuse of drugs. Offers experiences in development of curriculum and teaching approaches and material.

434-3 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 Na-

tional Red Cross and Illinois Heart Association cardiopulmonary resuscitation instructor authorizations provided. Consent of instructor required.

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.

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.

461-3 Health Education Summer Conference. 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.

462-3 Health Education Summer Conference. Conference style and format are similar but themes change.

463-3 Health Education Summer Conference. Conference style and format are similar but themes change.

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 various cultures as related to a total way of life of potential value to both prospective teachers and students in other fields.

488-1 to 3 Environmental Dimensions of Health Education. Application of the principles of learning to understanding Man interacting with his 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 or 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.

500-4 Community Organization for Health Education. Theory and practices in community organization for health education; group work methods and leadership theories are explored. Field observations required.

510-3 Curriculum in Health Education. Analyzes the significance of current trends in curriculum theory and design; develops objectives, content, learning approaches, resource teaching-learning materials; and evaluation as components of a curriculum guide.

511-3 Health Education Conference Practicum. A summer practicum course taken in conjunction with 461, 462, or 463. Participants help plan the conference, analyze activities, suggest alternatives, assume leadership responsibilities, prepare conference proceedings, and design a comparable experience with another focal theme. Prerequisite: consent of instructor.

515-3 Review of Current Literature in Health Related Fields. Develops a broad philosophical framework for health education and safety education, examining a variety of professional materials for their relevance to such a framework. Reading, reporting, discussing, and interacting in relation to issues of contemporary and future concerns by conceptualizing health as a process in the realization of individual and societal goals.

520-3 Special Projects in Health Education. Study of problems in health education and safety education culminating in a research paper.

526-3 Evaluative Approaches to Health Education. Survey and analysis of health testing and evaluation procedures, uses and limitations of knowledge and attitude tests, behavioral inventories, check lists, questionnaires, interviews, and other techniques.

530S-3 Research in Traffic Safety. A study of unique problems related to traffic safety and a review and evaluation of contemporary studies. Prerequisite: graduate standing or consent of instructor.

533A-4 Human Ecology I. The development of a theoretical construct for individual needs and community concerns. Programming trends related to the life-cycle including aging. An epidemiological approach to understanding the cause, nature, extent, and trends in conservation of human resources.

533B-4 Human Ecology II. Approaches to protective and preventative health measures. A study and evaluation of pilot and experimental programs of research and development in community efforts to meet existing and evolving health problems. An analysis of needed experimentation, research, and possible sources for planning leadership, programming, and funding for enhancing the quality of life. 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.

550S-3 Current Developments in Traffic and Safety Education. Current problems, trends, and research studies in traffic and safety education are reviewed, critiqued, and evaluated.

555S-3 Traffic Safety Management. Course deals with highway safety legislation and other acts related to traffic safety. Application of safety management techniques, procedures and structure of federal and state agencies are emphasized. Prerequisite: consent of instructor.

572-3 Coordination and Supervision of School Health and Safety Programs. For advanced students will have leadership responsibilities in planning, implementing, and coordinating comprehensive health and safety education programs at all levels from pre-school through junior colleges. Cooperative relationships among teaching, administrative, and supervisory personnel with community groups will be stressed.

590-8 Practicum in Community Health. Students are assigned full-time to a community health agency for experiences in health education. Restricted to those specializing in community health.

597-2 (1, 1) Seminar in Health Education. Advanced graduate students discuss individual health projects and present research problems. Each will present a dissertation prospectus.

598-3 Institute: Writing Research Proposals. Consideration is given to funding sources, proposal guidelines, procedures for support, budgetary requirements, and evaluation procedures. Students examine different types of funded projects, develop a research prospectus, and analyze the art of grantsmanship and political action.

599-1 to 6 Thesis.

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

Higher Education

402-1 to 2 Principles of Student Personnel Group Work. Acquaints the student with group work possibilities and functions in higher education. Elective Pass/Fail.

- 431-3 Workshop in Adult and Community Education.** (See Educational Leadership 431.)
- 501-2 Introduction to Research in Higher Education.** Provides an understanding of diverse research forms, of historical, ethical, and philosophical considerations in research, and of current issues in educational research with special reference to tertiary institutions.
- 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.
- 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 through case studies to problems of formal and informal structures, personnel policies, decision making, institutional self-study, and societal-governmental relations.
- 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.
- 518-3 College Teacher and College Teaching.** A study of the professional roles of academic man: as teacher, scholar, researcher, member of the profession, and faculty member. 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.
- 521-3 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 Philosophy of Higher Education.** Critical examination of assumptions, aims, operations, consequences, basic concepts and symbols of higher education from philosophic perspectives.
- 526-3 The Community-Junior 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.
- 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.
- 535-1 to 14 (a-h-1 to 3 each; i-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) Adult and continuing education, (h) Sociology of higher education, (i) Selected topic.
- 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 and junior 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.
- 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.
- 589-1 to 4 Higher Education Research Seminar.** Limited to doctoral students formulating and preparing research designs for investigation and implementation. Prerequisite: consent of instructor.
- 590-1 to 6 Individual Readings.** Supervised readings in the literature of higher education. Graded *S/U* only. Prerequisite: consent of instructor.
- 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.
- 595-1 to 6 Internship in Higher Education.** Supervised field experience in appropriate settings with evaluation seminars. Graded *S/U* only. Prerequisite: consent of instructor
- 599-1 to 6 Thesis.**

600-1 to 32 (1 to 16 per semester) Dissertation. Minimum requirement for Ph.D. in education is 24 hours.

History

415-3 European Rural Society, 400-1100 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. Elective Pass/Fail.

416-3 European Urban Society, 1000-1550 A.D. Merchants, bankers, craftsmen, lawyers, and bureaucrats: a sociological and economic analysis of the origins and development of early modern European urban institutions. Elective Pass/Fail.

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. Elective Pass/Fail.

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. Elective Pass/Fail.

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. Elective Pass/Fail.

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. Elective Pass/Fail.

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. Elective Pass/Fail.

423-4 Diplomatic History of Europe Since the Congress of Vienna. A study of the diplomatic relations between the nations of Europe in the 19th and 20th centuries.

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. Elective Pass/Fail.

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. Elective Pass/Fail.

430-3 The British Empire-Commonwealth. The rise of the British Empire and its subsequent development into a commonwealth of self-governing nations. Elective Pass/Fail.

431-3 British Constitutional History. The development of the English constitutional system from its origins to modern times. Elective Pass/Fail.

432-4 History of France. Social, economic, political, and intellectual evolution from mediaeval origins to the present day. French contributions to western culture. Elective Pass/Fail.

433-4 History of Germany. German state and society from the Middle Ages to the present day. Elective Pass/Fail.

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. Elective Pass/Fail.

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. Elective Pass/Fail.

436-6 (3, 3) History of Spain. (a) To 1700; (b) Since 1700. Institutional, intellectual, socio-economic, and political history from the Middle Ages to the present. Elective Pass/Fail for (b) only.

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. Elective Pass/Fail.

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. Elective Pass/Fail.

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 America History.** (a) 1896-1921; (b) 1921-1945. The history of the United States since 1896 with emphasis upon political history and behavior.
- 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. Elective Pass/Fail.
- 462-4 Problems in Black American History.** Developments which formed the foundation for the "Black Revolution" of the present time.
- 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 world power. Elective Pass/Fail.
- 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) To 1850; (b) Since 1850. 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. Elective Pass/Fail.
- 471-6 (3, 3) History of Mexico.** (a) 19th Century; (b) 20th Century. Significant political, economic, diplomatic, social, and cultural aspects of Mexican life from independence to the present time with emphasis upon the Mexican Revolutions. Elective Pass/Fail.
- 472-3 The Caribbean Area.** A history of the Caribbean from Columbus to modern times. Elective Pass/Fail.
- 473-3 Argentina and Chile.** A narrative and comparative history of these two leading Latin American nations with emphasis on the period since independence. Elective Pass/Fail.
- 474-3 Andean South America.** The political, economic, social and cultural development of the Andean nations from Pre-Columbian times to the present. Elective Pass/Fail.
- 475-3 History of Brazil.** The political, social, cultural and economic development of Latin America's largest nation. Elective Pass/Fail.
- 476-3 Dictatorships in Latin America.** A political, economic, social and military study of the domestic and international aspects of dictatorship. Elective Pass/Fail.
- 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. Elective Pass/Fail.
- 484-3 History of Inner-Asian Relations.** 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. Elective Pass/Fail.
- 485-3 History of the Middle East.** A study of 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. Elective Pass/Fail.
- 487-4 Topics in African History.** Investigations into the most important historical questions of Sub-Saharan Africa. Prerequisite: 387a, b or consent of instructor, or graduate standing. Elective Pass/Fail.
- 490-1 to 4 Special Readings in History.** Supervised readings for students with sufficient background. Prerequisite: Registration by special permission only.
- 491-3 Great Historians.** Writings of historians from Herodotus to Toynbee. Elective Pass/Fail.
- 492-3 Methods of Historical Research.** Fundamentals 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.
- 493-3 to 6 (3, 3) Problems in U.S. History.** Topics vary with instructor. May be repeated for a maximum of six semester hours provided registrations cover different topics. Topics announced in advance.
- 495-4 History Honors.** Principles of historical method, research, and writing for senior honor students only. Not for graduate credit. Prerequisite: consent of department.
- 497-3 Historical Museums, Sites, Restorations and Archives.** The historical development of the museum from the Academy, the Lyceum, and the Great Museum of Alexandria. Discussion of the museums that have developed in the last three centuries with emphasis on the United States will include historical sites such as battlefields, forts, historic buildings, restorations, historical monuments, and major archives. Field trips to some of these sites form part of the course.
- 498-3 Problems of the History Museum.** Examines the general background and function

of the museum in its 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.

515-3 to 6 (3, 3) Studies in Mediaeval and Renaissance History. A study of the major historical literature on the Middle Ages and Renaissance.

516-4 to 8 (4, 4) Seminar in Mediaeval and Renaissance History. A research course concerning selected topics in Middle Ages and the Renaissance.

520-3 to 6 (3, 3) Studies in Early Modern European History. A study of the major historical literature in early modern European history.

521-4 to 8 (4, 4) Seminar in Early Modern European History. A research course concerning selected topics in early modern European history.

522-3 to 6 (3, 3) Studies in Modern European History. A study of the major historical literature in modern European history.

523-4 to 8 (4, 4) Seminar in Modern European History. A research course concerning selected topics in modern European history.

530-4 Seminar in English History. A research course concerning selected topics in English history.

550-4 Seminar in American Colonial History. A content and research course concerning specific areas of American Colonial history.

551-4 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.

552-4 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.

553-4 Seminar in Twentieth Century United States History. A content and research course on American political history and behavior since 1896.

554-5 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.

562-4 Seminar in Black American History. A content and research course concerning selected areas of Black American thought and life.

563-4 Seminar in American Diplomatic History. A content and research course concerning selected studies in American diplomacy.

564-4 Seminar in American Economic History. A content and research course concerning selected topics in American economic history.

567-4 Seminar in Illinois History. A content and research course concerning selected topics in Illinois history, 1818-1918.

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.

587-4 Seminar in African History. A content and research course on selected topics in African history. Prerequisite: 487 or consent of instructor.

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 with whom he proposes to work. 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.

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.

Home Economics Education

(SEE VOCATIONAL EDUCATION STUDIES)

Human Development, Division of

Child and Family

There is no approved graduate program in child and family. Students currently

enrolled in a major in home economics may continue to receive graduate credit for the courses listed below:

408-3 to 9 (3, 3, 3) Workshop. Designed to aid workers in professions related to child and family. Emphasis for the workshop will be stated in the announcement of the course.

410-3 Human Sexuality. Provides detailed in-depth information on such topics as philosophical views of sexual behavior, sex techniques, sex therapy, sexual variations, sexual anatomy and physiology, including the sexual response and changes with age, and sexual development in childhood.

445-3 Administration of Pre-School Programs. Planning and organizing programs for preschool or residential facilities including budgeting, staffing, programming, and evaluation. Prerequisite: 345 and 346 or consent of instructor.

456-3 Infant Development. Current theories and knowledge concerning growth and development of infants with related laboratory field experiences. Prerequisite: 237 or Psychology 301 or equivalent.

457-3 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: 456 or concurrent enrollment.

466-3 Practicum in Parent-Child Study. Designed to increase student's ability to work with parents and parent groups through an awareness of factors in the parent-child relationship and knowledge of current research and methods in parent education. Integration with infant and child development laboratories and related field experience. Prerequisite: 227, 237, or equivalent.

471-2 to 6 Field Experience. Supervised learning experiences in community nursery schools and public agencies. Prerequisite: consent of instructor.

481-1 to 3 Readings. Child development and family living readings under staff supervision. Prerequisite: consent of instructor and chairman.

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: 227 or equivalent and consent of instructor.

500-3 Research Methods. The study of principles of research design and basic techniques in child and family research. Prerequisite: Guidance and Educational Psychology 505, Mathematics 420 or consent of instructor.

556-3 The Pre-School Child. Growth of the child from birth to six years with emphasis on the various aspects of growth and their interrelationships.

562-3 Child Development through Home and School. The normal, healthy development of children as it takes place in the home and is promoted by the curriculum and other school activities.

566-3 Interpersonal Relationships within the Family. A study of factors that promote satisfactions with the immediate family; planning and preparing teaching units, and source materials in this field.

571-3 Recent Research. Review of selected research in areas of child and family.

572-1 to 3 Special Problems. For qualified students who need to pursue certain topics further than regularly titled courses permit. Prerequisite: consent of chairman.

599-1 to 4 Thesis. Minimum of three hours counted toward a master's degree.

Family Economics and Management

There is no approved graduate program in family economics and management. Students currently enrolled in a major in home economics may continue to receive graduate credit for the courses listed below:

407-1 to 3 Workshop. Designed to aid workers in professions related to use of family resources. Emphasis for each workshop will be stated in the announcement of the course. Every semester.

420-3 Trends in Household Equipment. Design, function, principles of operation, current trends, and ecological problems related to equipment use in household and society are considered. Prerequisite: 320.

430-3 Housing Alternatives. Selected aspects of the housing market and their relationship to changing life styles of households. Structure, operations and performance of the housing market and home building industry, housing finance, and contemporary housing problems and issues are considered. Fall Semester. Prerequisite: 330 or consent of instructor.

445-3 Family Financial Management. Developments in family financial management and the evaluation of methods and procedures for helping families, with emphasis on the role of the consultant. Case studies and simulation, as well as field problems, are included. Fall semester and alternate summers. Prerequisite: 340 and 350, equivalent, or consent of instructor.

451-3 Household Activity Analysis. A study of work methods and place, as well as the

characteristics of the worker, in relation to solving problems of employed, full-time, and handicapped home managers.

480-3 Women in the Home and Labor Market. An evaluation and interpretation of the economic contributions of women in household production and in the labor market. Related issues such as fair employment practices, role conflicts, and legal issues will be considered.

490-1 to 4 Readings. Supervised readings on selected equipment, family or consumer economics, housing, or management topics. Every semester. Prerequisite: six hours of family economics and management and consent of chairperson.

494-1 to 4 Field Experience. Supervised learning experiences in an acceptable employment area. Every semester. Prerequisite: 370 and consent of chairperson.

499-1 Senior Seminar. A study of contemporary issues in the field of family economics and management including the concerns of new professionals entering the field. Not for graduate credit.

500-3 Research Methods. Review of basic scientific methods of research applicable to family economics, management, housing, and equipment. Statement of research problems, collection, analysis, and interpretation of data are included. Fall semester and alternate summers. Prerequisite: statistics or concurrent enrollment.

530-3 Societal Factors in Housing. An analysis of housing as it relates to levels of living in contemporary households. Cultural determinants, community development, governmental policies and programs, and personal and social organization are considered as they relate to family housing. Spring semester. Prerequisite: 430 or consent of instructor.

535-3 Housing Consumption. Housing consumption patterns, housing markets and economic aspects of government housing policies will be analyzed as they will affect family life styles. Composition of household and communities will be of special interest. Prerequisite: 341, Economics 215, or equivalent, and consent of instructor.

540-3 Consumption Trends. Contemporary trends and issues in family income and consumption are evaluated. Spring semester and alternate summers. Prerequisite: 340 or equivalent.

550-3 Advanced Home Management. Readings, observations, projects, and discussions are used in evaluation of current research trends and issues in home management as they reflect family management processes. Fall semester and alternate summers. Prerequisite: 350.

570-3 Seminar in Family Economics and Management. Review and analysis of research in family economics, management, housing, and equipment. Implementation and organization of programs to help families is emphasized. Fall semester and alternate summers.

592-1 to 5 Special Problems. Selection and investigation of a special problem under personal supervision of graduate faculty, approved by the chairperson and instructor. Every semester. Prerequisite: six hours of family economics and management and consent of chairperson.

599-1 to 6 Thesis. Every semester.

Food and Nutrition

There is no approved graduate program in food and nutrition. Students currently enrolled in a major in home economics may continue to receive graduate credit for the courses listed below:

420-3 Recent Developments in Nutrition. Critical study of current scientific literature in nutrition. Prerequisite: 320 or equivalent. Elective Pass/Fail.

421-2 Recent Trends in Food. Critical study of current scientific literature in food. Prerequisite: 320 or equivalent. Elective Pass/Fail.

481-2 to 4 Readings. Supervised readings for qualified students. Prerequisite: 320 or equivalent, consent of instructor and department chairman. Elective Pass/Fail.

490-3 Nutrition and Growth. The study of human nutrition during each phase of the life cycle, prenatal through geriatric. Students elect at least two phases for in-depth study. A general review of basic nutrition is included. Prerequisite: consent of instructor and department chairman. Elective Pass/Fail.

500-3 Research Methods. Study of methods employed in research in food and nutrition. The development of a research design selected on the basis of the interest and need of the student. Field trip. Prerequisite: 420 or equivalent and statistics.

515-1 to 4 (1, 1, 1, 1) Seminar. Participation of staff and students in reporting and discussing research papers, research in progress and current professional meetings. Required for all graduate majors in food and nutrition, one credit per semester. Graded *S/U* only. Prerequisite: 420 or 421.

520-2 Advanced Nutrition. The biochemical and physiological basis of the metabolism of nutrients; current concepts. Prerequisite: 420 or equivalent.

556-3 Advanced Experimental Foods. Individual problems in food research and interpretation of pertinent literature. Prerequisite: 356 or equivalent.

572-2 to 4 (2, 2) Special Problems. Directed research on approved projects in selected

areas of food and nutrition not covered in their thesis or research paper. Graded *S/U* only.

Prerequisite: consent of instructor.

599-1 to 6 Thesis. Minimum of four hours to be counted toward a master's degree. Prerequisite: approval of instructor.

Human Resources

410-3 Resources for the Elderly. Recognition and examination of needs, situations, and issues affecting elderly persons; resources and sources of benefits available. Emphasis on techniques and application of information through interaction with the elderly. Prerequisite: two courses in behavioral sciences.

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.

420-3 Coal Analysis and Inspection. A study of methods and equipment for the inspection and analysis of coal including the techniques for the design of coal-quality experiments. Laboratory. Prerequisite: 365 or appropriate background.

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.

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. Prerequisite: 365, 375, Engineering 222.

460-5 Mining Technology. Mining methods; mine ventilation and pumping systems; mine structures; power distribution; coal-mine development and exploitation. Prerequisite: 360 or appropriate background.

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 Occupational 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.

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. One field trip is required. Cost should not exceed \$20. Prerequisite: 311.

- 420-3 School Publications.** Designed for the prospective high school or junior college journalism teacher or publication director. Deals with practical production problems of school newspapers and yearbooks.
- 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 problems facing the mass media in the last third of the Twentieth Century. Involves questions of economics, structure, ethics, effects.
- 479-2 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 2, 1 to 2, 1 to 2) Readings.** Supervised readings on subject matter not covered in regularly scheduled courses. Prerequisite: written consent of instructor and area head.
- 494-1 to 3 Practicum.** Study, observation, and participation in publication or broadcast activities. Not for graduate credit. Prerequisite: consent of instructor and area head.
- 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.
- 501-2 Research Methodology in Mass Communication II.** Problems of measurement, attitude scaling techniques, questionnaire construction, and bivariate and multivariate methods of data analysis in journalism and mass communication. Prerequisite: 500.
- 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.
- 505-2 Theoretical Issues in Mass Communication.** Analysis and critique of recent theory and research in mass communication. Examination of trends in research and reviews of selected literature. 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.
- 510-2 Literature of Journalism.** Critical reading of selected books relating directly and indirectly to journalism from about 1900 to present. Lectures, reviews, and discussion comprise the course work.
- 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.
- 512-2 Press Freedom and Censorship.** Study of the progress of press freedom in England and in the United States, with attention to the many attempts at censorship of all kinds.
- 520-2 Communication and National Development.** Examination of a wide range of functions of mass media communications in the process of national development in non-Western countries.
- 530-2 Historical Research in the Mass Media.** Analysis of and practice in scholarly writing in historical areas of the mass media. Consideration of sources, attitudes, data, selection, and verification as related to historical research in mass media. Prerequisite: 511.
- 540-3 Legal and Governmental Research in the Mass Media.** Study of research procedures related to executive, congressional, judicial, and quasi-official reports and documents as they affect the mass media. Focus of the study will be an examination of the legal interrelationship of the government and the media. Prerequisite: 442.
- 550-1 to 12 (1 to 4, 1 to 4, 1 to 4) Topical Seminar.** Seminars on subjects of current interest, with the topics determined through student and faculty request and interest. Topics include audience analysis, communication and social systems, media economics, persuasive communications.
- 560-3 Seminar: Critical and Persuasive Writing.** An analysis of the opinion function of the news media—the editorialist, 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 2, 1 to 2, 1 to 2) Individual Research. Conduct of research and writing of research reports for projects of an individual nature.

599-1 to 6 Thesis.

600-1 to 32 Dissertation.

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. Elective Pass/Fail.

402-7 (3, 3, 1) Phonetics. (a) Theory and practice of articulatory phonetics. (b) Theory and practice of instrumental phonetics. Prerequisite: 402a. (c) Transcription laboratory. Prerequisite: 402a. May be taken singly. Elective Pass/Fail.

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. Elective Pass/Fail.

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. Elective Pass/Fail.

405-4 Phonological Theory. Survey of pre-structural, structural (both American and European), distinctive feature, stratificational and generative phonological theories; phonological universals. Data manipulation and problem solving. Prerequisite: 300 or 401, and 402a. Elective Pass/Fail.

408-4 Syntactic Theory. Basic concepts and formalisms of transformational generative grammar. Data manipulation and problem-solving in English syntax. Prerequisite: 300 or 401, or consent of department. Elective Pass/Fail.

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, (i-j) Lao, (k-l) Cambodian. Prerequisite: 210 or equivalent.

411-3 The Linguistic Structure of Chinese. (See Chinese 410.)

412-3 The Linguistic Structure of Japanese. (See Japanese 410.)

415-3 Sociolinguistics. History, methodology, and future prospects in the study of social dialectology, linguistic geography, multilingualism, languages in contact, marginal languages, and language planning. Prerequisite: one previous course in linguistics or consent of department. Elective Pass/Fail.

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, (i-j) Lao, (k-l) Cambodian. Prerequisite: 410 or equivalent.

422-3 Contemporary Vietnamese Prose. Open to advanced students. Short stories, novels and essays (main trends and evolution). Emphasis on works of prominent authors since 1920, such as Nguyen V. Vinh, Pham Quynh, H. N. Phach, Nguyen T. Thuat, P. K. Binh, Khai Hung, and the recent generation. Prerequisite: 321 or 410.

423-2 Vietnamese Poetry. Classical and modern poetry. Emphasis on masterpieces and leading figures such as Nguyen Trai, Nguyen Binh Khiem, the authors of Chinh Phu Ngam and Cung Oan, Nguyen Huy Tu, Nguyen Du and the Kim Van Kieu, Nguyen Cong Tru, and the new poetry with the impact foreign poetry had on it. Prerequisite: 310 or 410.

424-2 Modern Vietnamese Drama. Hat boi (Vietnamese Opera), Hat cheo (Popular Theater from North Vietnam), Cai luong (Modernized Opera and Musical), Thoai kich (Modern Theater), and Kich tho (Lyric Theater). Emphasis on the main plays, the stage techniques, and the literary and social meaning of those various forms of Vietnamese theater. Prerequisite: 321 or 410.

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. Elective Pass/Fail.

431-3 Structure of the English Verb. An analysis of the English verb system. Special study of the modals and non-finites. Elective Pass/Fail.

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. Elective Pass/Fail.

445-4 Psycholinguistics and Language Teaching I. A broad spectrum introduction to psycholinguistics and its applications to language teaching and learning. Although both first and second language acquisitions are covered for completeness, emphasis is placed on topics relevant to second language acquisition.

- 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. Elective Pass/Fail.
- 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. Elective Pass/Fail.
- 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. Mandatory Pass/Fail.
- 455-2 Materials in TESL.** Examination and criticism of currently used textbooks in ELS 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. Elective Pass/Fail.
- 456-1 Contrastive Linguistics Practicum.** Examination of the interference of other languages, particularly Spanish, 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. Elective Pass/Fail.
- 497-1 to 8 Readings in Linguistics.** Directed readings in selected topics. Prerequisite: consent of department and undergraduate status.
- 501-3 Contrastive Linguistics.** 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.
- 504-3 Dialectology.** Materials and methods of areal and social dialectology and linguistic geography. Prerequisite: one previous course in linguistics 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 408, or consent of department.
- 510-3 History of Linguistics.** The history of linguistic inquiry from classical times to the present. Prerequisite: one previous course in linguistics or consent of department.
- 530-3 to 6 (3, 3) Historical Grammatical Structures.** History of particular languages or language 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.
- 540-1 to 12 (1 to 3 per topic) Studies in Linguistics.** Selected topics in theoretical and applied linguistics. May be repeated to a total of 12 hours of credit with consent of department. Maximum of six hours applicable toward a basic master's degree. Prerequisite: one previous course in linguistics or consent of department.
- 550-4 to 8 (4 per topic) Seminar in Linguistics.** Guided advanced research in either syntax/symantics, generative phonology, socio-linguistics, psycholinguistics, historical linguistics, or other topics. May be repeated to a total of 8 hours of credit with consent of department. Prerequisite: consent of department.
- 570-3 Theory and Methods of EFL/ESL.** Theory and methods of teaching English as a second or foreign language. Recent developments in EFL/ESL; cognitive-code and audio-lingual theories and methodologies.
- 571-2 Language Laboratories in EFL/ESL.** The theory and practice of the language laboratory in EFL/ESL pedagogy. 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.
- 575-2 EFL/ESL Testing.** Theory and construction of standardized and teacher-made tests. Special study of TOEFL and other tests of English as a foreign language. Prerequisite: 570 or consent of department.
- 580-3 Seminar in Special Problems of EFL/ESL.** Prerequisite: 570.
- 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. Graded *S/U* only. Prerequisite: consent of department.
- 585-2 Practicum in EFL/ESL: Written English.** Objectives, methods, and materials for Linguistics 101, 102, and 103 and similar courses. Observation and practice under supervision. Graded *S/U* only. 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.

Mathematics

400-2 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. Prerequisite: 319 and 352 or consent of instructor. Elective Pass/Fail.

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. Elective Pass/Fail.

406-3 Eigenfunction Methods in Applied Mathematics. Inner product spaces; orthonormal systems; Bessel's inequality; quadratic forms; Hermitian operators; eigenfunctions and eigenvalues; minimization properties of eigenfunctions; the spectral theorem for a Hermitian matrix; functions of matrices; Sturm-Liouville differential operators; convergence properties of Fourier Series; the Legendre, Laguerre, Hermite, and Tchebycheff families of orthogonal polynomials; functions of Sturm-Liouville operator; Green's functions; the Laplacian operator in 1, 2, and 3 dimensions. Prerequisite: 221 and 305. Elective Pass/Fail.

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 solution. Prerequisite: 305. Elective Pass/Fail.

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. Elective Pass/Fail.

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. Elective Pass/Fail.

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. Elective Pass/Fail.

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. Elective Pass/Fail.

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. Elective Pass/Fail.

426-3 Introduction to Mathematical Logic. (Same as Philosophy 426.) 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 Gödel's theorem. Prerequisite: 301, 319, 352, or Philosophy 320. Elective Pass/Fail.

432-4 Philosophy of Mathematics. (See Philosophy 432.) Prerequisite: Philosophy 320 or 15 hours of mathematics. Elective Pass/Fail.

433-3 Introduction to Topology. Study of continuity, convergence, compactness, and completeness in the context of metric spaces. Prerequisite: 352 or consent of department. Elective Pass/Fail.

435-3 Elementary Differential Geometry. An introduction to modern differential geometry through the study of curves and surfaces in 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. Elective Pass/Fail.

437-3 Elementary Algebraic Topology. Topological spaces; continuous maps. Finite products. Connectivity. Compactness. Manifolds. Classification of surfaces. Homotopic maps. Fundamental group. Covering spaces. Lifting theorem. Prerequisite: 319. Elective Pass/Fail.

445-3 Boolean Algebra and Logical Design. (Same as Computer Science 445.) Boolean algebra with applications to computer logic and circuit design. Simplification algorithms. Sequential circuits and sequential machines. Introduction to error-correcting codes. Prerequisite: 319, 301 or Computer Science 342.

449-3 Combinatorics and Graph Theory. (Same as Computer Science 449.) An introduction to graph theory and combinatorial mathematics with computing applications. Topics include permutations and combinations, generating functions, recurrence relations, the principle of inclusion and exclusion. Polya's theory of counting, graph theory, transport networks, matching theory, block designs. Prerequisite: 301, or consent of Mathematics Department.

451-3 Introduction to the Theory of Computing. (See Computer Science 451.)

452-4 Advanced Calculus. Fundamental concepts of analysis; infinite series, functions and series of functions, uniform convergence, function of bounded variation, Riemann-Stieljes integral, functions of several variables, implicit functions and extreme values. Prerequisite: 352 or consent of department. Elective Pass/Fail.

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. Elective Pass/Fail.

457-5 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.

460-3 Transformation Geometry. Geometry as the study of properties invariant under congruences, similarities, affine transformations, and projectivities. Prerequisite: 221 and 319. Elective Pass/Fail.

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: 139 or 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: consent of department. Elective Pass/Fail.

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. This is a comprehensive introduction to probability theory at a level suited to most upper division undergraduates and first year graduate students. Topics include: event spaces, probability functions, combinatorics, generating functions, conditional probability, independence, random variables, probability distributions, expectations, moments, characteristic functions, inversion formulae, sums of independent random variables, the multivariate normal distributions, the central limit theorem, the weak and strong laws of large numbers, Monte Carlo applications. Prerequisite: 250. Elective Pass/Fail.

481-3 Elements of Stochastic Processes. An introduction, including normal, Poisson, and Markov processes. Prerequisite: 480. Elective Pass/Fail.

483-3 Introduction to Mathematical Statistics. A development of the elements of statistical theory. Probability axioms, probability distributions, moments and moment generating functions. Statistical inference, estimation, testing hypotheses. Not for graduate credit in mathematics. Prerequisite: 250. Elective Pass/Fail.

486-3 Design of Experiments. A mathematical model development of the statistical design and analysis of experiments with emphasis on practical applications. Includes completely randomized, randomized block, Latin square, split plot, incomplete block, and response surface designs, as well as factorial and fractional factorial experiments. Prerequisite: 483. Elective Pass/Fail.

487-3 Nonparametric Methods in Statistics. A discussion of confidence intervals and tests of hypotheses where no functional form is postulated for the population. Prerequisite r83 or 480. Elective Pass/Fail.

488-3 Linear Statistical Models. An introduction to the general linear model in both the

univariate and multivariate cases and its applications. Included is a basic discussion of linear models, estimable functions, estimation spaces, error spaces, and such applications as regression analysis, growth curve analysis, discriminant analysis and canonical analysis. Prerequisite: 221 and 483. Elective Pass/Fail.

495-1 to 6 Special Topics in Mathematics. Individual study or small group discussions in special areas of interest under the direction of a member of the faculty. Prerequisite: consent of chairman and instructor. Elective Pass/Fail.

501-3 Real Analysis. Structure of sets of real numbers; measure spaces; measurable functions; integration; modes of convergence; Caratheodory process; product measures; Fubini's theorem; Lebesgue measure and integral; differentiation; signed measures; Radon-Nickodym theorem. Prerequisite: 452.

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 6 Advanced Topics in Ordinary Differential Equations. Topics chosen from: stability; oscillations; functional differential equations; perturbations; limit point and limit circle; boundary value problems; 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 Neumann functions. Classification of linear and quasilinear PDE's. Theory of characteristics. The Cauchy-Kowalawski theorem. The max-min principle, the energy-integral method, and questions of uniqueness. Questions of existence. Prerequisite: 452.

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 undecidability results of Gödel, Church, and Tarski; consistency of arithmetic. Prerequisite: 426.

512-3 to 12 (3 per topic per semester) Topics in Mathematical Logic. (a) Model Theory. (b) Axiomatic Set Theory. (c) Combinatory Logic. (d) Proof Theory. Student can take up to a maximum of twelve hours in combination of topics. Prerequisite: consent of instructor.

514-4 General Statistical Analysis. Concepts of probability: probability axioms, random variables, probability distributions, moments. Statistical estimation: criteria for estimators, sampling distributions of estimators, confidence intervals. Tests of significance: normal theory tests, power, robustness, nonparametric procedures. Relationships between purpose of experiment, experiment, data, and data analysis. This course does not give credit toward a mathematics major. Prerequisite: 111.

515-4 Linear and Multivariate Statistical Methods. Analysis of the general linear model: regression, analysis of variance, and analysis of covariance. Principal component analysis. Discriminant analysis. Analysis of the multivariate general linear model. Basic experimental designs and probability sampling procedures. This course does not give credit toward a mathematics major. Prerequisite: 514.

516-8 (4, 4) Statistical Analysis in the Social Sciences. (a) Descriptive statistics; graphic display of data; concepts of probability; statistical estimation, and hypothesis testing. Applications to social science data. (b) Matrix algebra; general linear model; multivariate statistics, ordinal and nominal measures of associations, and causal modeling. Applications to social science data. This course does not give credit toward a mathematics major. Prerequisite: one year of high school algebra or the equivalent.

520-3 Algebraic Structures. Algebraic field extensions, splitting fields. algebraic closure, separable and inseparable extensions, the fundamental theorem of Galois theory, solvability by radicals. Tensor products of modules, finitely generated modules over principal ideal domain, applications to abelian groups, tensor algebras, exterior algebras, derivation, traces and dual modules. Prerequisite: 419.

t22-3 to 9 per topic (3, 3, 3) Advanced Topics in Algebra. (a) Ring Theory: primitive rings, radicals, completely reducible rings, Artinian and Noetherian rings, projective and injective modules, complete ring of quotients, classic 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.

525-3 Number Theory. Introduction to modern analytic and algebraic techniques used in

the study of quadratic forms, the distribution of prime numbers, diophantine approximations, and other topics of classical number theory. Prerequisite: consent of instructor.

526-3 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 automorphic forms. Prerequisite: consent of instructor.

528-3 Formal Languages and Automata. (Same as Computer Science 553.) Algebraic analysis of automata with emphasis on semigroup and decomposition theory. Probabilistic automata. Grammars including regular, context-free, context sensitive and type 0. Normal forms, restricted grammars. Closure properties. The relation between grammars and automata. Basic decision problems. 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, 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 434 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, Poincare 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; Poincare 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. (f) Logic and Foundations. (g) Topology. (h) Applied Mathematics. (i) Differential Equations. (j) Number Theory. (k) Master of Science seminar. Prerequisite: consent of instructor.

551-3 Introduction to Functional Analysis. Inner product and normed spaces; Hahn-Banach theorem; L^p spaces; continuous function spaces; dual spaces; uniform boundedness principle; open mapping and closed graph theorems; fixed point theorems; spectral theorem. Prerequisite: 433, 501.

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.

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.

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.

580-3 Statistical Theory. An introduction to mathematical statistics. Estimation theory including such topics as the Cramer-Rao and Chapman-Robbins inequalities, and the Rao-Blackwell theorem. Testing hypotheses with emphasis on the monotone likelihood ratio and

the exponential family. A short introduction to Bayes and other decision procedures. Prerequisite: 480.

581-3 Probability. General probability spaces, review of measure and integration; product spaces, product measures, Fubini's Theorem. Probability and random variables: induced measures, distribution functions, expectations, types of convergence, independence, characteristic functions. Sums of independent random variables: tail events and tail functions; Borel Cantelli lemma, zero-one law; Kolmogorov's inequality, convergence of series, the Strong Law of Large Numbers. Prerequisite: a concurrent course in real variables (501).

582-3 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; arc sin 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-Infinitely 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 statistical decision theory. Topics can include: Multiple decision procedures; sequential analysis; advanced multivariate theory; non-parametric theory; order statistics. Prerequisite: 581 for (a) and both 580 and 501 for (b).

595-1 to 6 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.

599-1 to 6 Thesis. Minimum of three hours to be counted toward the Master of Arts degree.

600-1 to 30 Dissertation. Minimum of 24 hours to be earned for the Doctor of Philosophy degree.

Medical Education Preparation

No 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.

400-1 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.

401-1 to 20 (1 to 2 per area) Medprep Basic 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 within 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 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 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

403-2 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 man. Two 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.

425-4 (2, 2) Biochemistry and Physiology of Microorganisms Lecture. Chemical composition, cellular structure, and metabolism of microorganisms. Prerequisite: organic chemistry.

426-4 (2, 2) Biochemistry and Physiology of Microorganisms Laboratory. Prerequisite: 425a,b or concurrent enrollment.

441-3 Virology Lecture. General properties; classification and multiplication of bacterial and animal viruses; lysogeny; immunological and serological reactions; relation to viruses to cancer; consideration of selected viral diseases of animals. Prerequisite: 301 and 302.

422-2 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, viral, and mycotic infections in people. Three hours lecture. No limit of enrollment. Prerequisite: 403, 441, and 451.

454-2 Clinical Microbiology and Immunology Laboratory. Methods and procedures in the clinical diagnosis of microbiologic 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. Genetic mechanisms, mutation, transformation, recombination, transduction, lysogeny, phenotypic mixing, and reactivation phenomena. Six hours laboratory. Prerequisite: 460 or concurrent enrollment.

462-2 Fungal Genetics Lecture. Mendelian and molecular genetics of molds and yeasts. Mutant induction, sexual crosses, tetrad analysis, linkage, and mapping. Two hours lecture. Prerequisite: Biology 305.

463-2 Fungal Genetics Laboratory. Four hours laboratory. Prerequisite: 462 or concurrent enrollment, and consent of instructor.

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. 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.

502-3 Evolution of Genetic Thought. A critical examination of the development of genetic thought. Three hours lecture/discussion. To be offered alternate years with 562. Prerequisite: Biology 305.

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.

541-3 Advanced Virology Laboratory. Experiments to monitor synthesis of macromolecular components of viruses. Animal cell virology; tissue culture analyzed and practiced in depth; karyotyping; viral growth and purification; aqueous polymer phase separation, ultracentrifugation, calcium phosphate chromatography, and phenol extraction techniques covered; biochemical analysis of viral macromolecules. Offered in alternate years with 543. Prerequisite: 540.

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: 541.

543-3 Molecular Virology Laboratory. Characterization of viruses and their constituents; physicochemical properties, synthesis of nucleic acids and proteins; induction of release of viruses from transformed cells; differentiation of courses of viral components; studies of various species of nucleic acids by such methods as sedimentation velocity, ultracentrifugation, pulse and pulse chase experiment, and polyacrylamide gel electrophoresis. Offered in alternate years with 541. Prerequisite: 541.

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.

562-2 Molecular Genetics. Fundamentals, including discussions of current research of replication, transcription, translation, mutation, suppression, repression, and their interaction and interdependence. To be offered alternate years with 502. Prerequisite: 425 and a 400 level course in genetics.

564-2 Bacterial Sexuality. Populations of bacteria and their symbionts considered as adaptive entities. Stress processes and consequences of gene flow from a general systems viewpoint. Two lecture/discussions per week. Prerequisite: Biology 305 and Microbiology 460 or Biology 305, Microbiology 302 and another microbial genetics or molecular biology course; or consent of instructor.

599-1 to 3 Thesis. Prerequisite: consent of instructor.

600-1 to 12 Dissertation. Prerequisite: consent of instructor.

Mining Engineering

401-1 Introduction to Mining Engineering. A broad treatment of the importance of coal and its products in the modern society. Analyzing the markets for coal and its products. Mining operations and related environmental impacts. Prerequisite: graduate or senior standing in engineering disciplines.

410-3 Mine Extraction Systems. Study of coal property evaluation. Surface and underground mining methods. Mining production and its ancillary systems and subsystems. Prerequisite: graduate or senior standing in engineering disciplines.

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, instructors consent.

415-2 Surface Mining and Land Reclamation. Study of surface mining methods and their elements. Surface mine design. Land reclamation. Economics of mining and reclamation. Prerequisite: graduate or senior standing in engineering disciplines.

420-2 Coal Preparation and Waste Treatment. Impurities in coal and their impact on the market. Impurities liberation and separation methods. Product preparation. Coal washability characteristics. Flow sheet development. Recovery of coal from tailings, slurry ponds and mine waste. Economics of coal preparation. Prerequisite: graduate or senior standing in engineering disciplines.

421-2 Coal Conversion and Combustion Processes. Overview of major present-day and proposed processes converting coal to other energy forms (gaseous or liquid fuels, coke, steam, electricity, etc.). The physical and chemical properties of coal and the chemical reaction relationships which affect the conversion process paths. Process design aspects of coal-fed boilers, coal coking ovens and coal gasification/liquefaction reactor systems. Environmental and cost considerations related to the construction of coal conversion plants. Prerequisite: graduate or senior standing in scientific discipline.

510-2 Strata Control and Rock Mechanics. A unified treatment of rock mechanics theories and their applications to coal mine strata control. Physical geology of coal measures. Subsidence. Stress and analysis and pressure distribution around mine openings. Mine roof support systems. Ground stability and control. Prerequisite: 410, Geology 220, Engineering 311.

511-2 Advanced Strata Control. Application of rock mechanics to design of strata control systems in room and pillar, longwall, and shortwall mining methods and to soil and rock slopes in the surface mining methods. Subsidence and minimizing structural damage due to subsidence. Prerequisite: 510.

520-2 Mine Ventilation Design and Environment Control. 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. Dust characteristics and control. Noise control. Mine illumination. Prerequisite: 410 and Engineering 313.

521-2 Material Handling and Mine Drainage. Study of material handling and waste disposal methods. Material handling systems selection. Systems design and development. Material handling economics. Mine drainage systems. Prerequisite: 410 and Engineering 313.

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.

550-1 to 3 Internship. Placement in an approved setting, e.g., at a mine or other mining related operation. Required of all students in mining engineering. Prerequisite: graduate standing.

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.

Molecular Science

400-10 (5, 5) The Mathematical and Physical Basis of Molecular Science. A survey of topics in mathematics, physics, and chemistry relevant to molecular science. (a) Topics are drawn from classical mechanics, thermodynamics, and statistical thermodynamics. (b) Topics are drawn from classical electromagnetic theory, chemical kinetics, and quantum mechanics. The mathematics appropriate and necessary to the discussion of these topics is presented in an integrated manner throughout the course. Prerequisite: consent of the molecular science program chairman.

500-5 The Biological Basis of Molecular Science. A survey of topics in biology relevant to molecular science. Areas covered include supramolecular structure, structure of cell matrix, water structure and consideration of energy flux in living systems. Prerequisite: 400 and consent of the molecular science program chairman.

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: admission to the molecular science doctoral program and consent of instructor.

598-2 to 16 Special Projects in Molecular Science. Prerequisite: admission to the Molecular science doctoral program and consent of instructor.

600-1 to 36 (1 to 16 per semester) Dissertation. Hours and credit to be arranged by the chairman. Prerequisite: admission to advanced study in molecular science.

Music

Courses in this department may require the purchase of music literature and other incidental supplies.

400-1 to 2 (1, 1) Performance Techniques. Individual instruction in any secondary applied field. Designed to provide added depth of preparation for teaching instrumental and vocal music. Prerequisite: completion of 340 level or the equivalent in some field of applied music.

407-2 Modal Counterpoint. Study of Renaissance contrapuntal techniques. Extensive writing practice, and analysis of stylistic models. Prerequisite: 207.

410-6 (3, 3) Ethnomusicology. (Same as Anthropology 410h,i). (h) Oceania, Asia, and Africa, (i) Middle East, Europe, and the New World.

414-1 to 8 (1 to 2 per semester) Collegium Musicum. For experienced singers and instrumentalists. Emphasis upon practical study of historical music literature of the Renaissance, and Baroque eras. Counts as a "major ensemble" for juniors and seniors.

420-1 to 2 (1, 1) Instrument Repair. A shop-laboratory course dealing with the selection, tuning, adjustment, maintenance, and repair of musical instruments.

421-2 Advanced Analysis. Structure, form, and design in music as the coherent organization of all of its factors. Analysis of works chosen from a variety of styles and genres. Prerequisite: 321.

430-1 Jazz Arranging. Methods of scoring for popular groups. Practice in scoring arrangements and/or original compositions for jazz ensembles. Prerequisite: 324 or prior consent of instructor.

440-1, 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 be concurrently enrolled in one of the performance groups. Prerequisite: for 440, 540: two semesters of C 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 with prior approval by their applied jury for the 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.

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|--------------|---------------|----------------|
| a. Flute | h. Trombone | o. String Bass |
| b. Oboe | i. Baritone | p. Voice |
| c. Clarinet | j. Tuba | q. Piano |
| d. Bassoon | k. Percussion | r. Organ |
| e. Saxophone | l. Violin | s. Harpsichord |
| f. Horn | m. Viola | t. Guitar |
| g. Trumpet | n. Cello | u. Recorder |

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 GSA 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.

460-3 Music Aesthetics and Appreciation. The significance of music for people. Critical theories in the writings of philosophers of music and art from Plato through Dewey and Cage are related to principles and methods for communicating an understanding of music in schools and in society.

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: 380-4.

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.

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.

502-4 (2, 2) Analytic Techniques. Analysis of representative works chosen from the Baroque, Classical, Romantic, and Modern eras. Prerequisite: graduate standing in music or prior consent of instructor.

503-3 Scientific Evaluation and Research in Music. Quantified research concepts and vocabulary; measurement theory and techniques for evaluating and testing musical aptitude and achievement; investigation of acoustical perception; survey of current scientific research in music. A research project is required.

509-2 History and Philosophy of Music Education. The evolution of school music and its changing relationship to the individual, to society, and to the school curriculum.

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 the 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. Regular participation, including accompanying, in any organized performing ensemble. One credit per group; maximum of two credits for concurrent participation in two groups.

567-1 to 8 Music Theater Workshop. For experienced singers, actors, dancers, and instrumentalists. Normally offered during summer as a fulltime course for eight credits, or partial credit for the orchestral players. Prerequisite: audition.

568-1 to 16 (1 to 8 per semester) Opera Workshop. Open to all experienced singers and stage technicians. Performs one major work and two or more excerpt programs per year. Normal registration is for two credits; four credits with permission for those with major roles; eight credits for full time summer workshop.

570-3 History of Opera. The development of the music, libretti, and staging of opera from the late Renaissance to the present, with a detailed study of selected works. Prerequisite: for non-music majors: prior consent of instructor.

573-3 Medieval Music. Music of the medieval world; Gregorian chant; the Tropes; secular songs of the troubadours and trouveres; the rise of polyphony; Ars Antiqua; organum and conductus; Ars Nova; Dunstable and English descant up to about 1450; types of notation. Prerequisite: for non-music majors: prior consent of instructor.

574-3 Renaissance Music. Burgundian and Netherlands music from 1450 and its spread; Isaac and Josquin; 16th Century polyphony in France, Germany, Spain, and England; the rise of music for instruments and for solo voices. Prerequisite: for non-music majors: prior consent of instructor.

578-3 Twentieth Century Music. The heritage of 20th century music. Study and analysis of musical philosophies and techniques of post-impressionist and contemporary composers. Prerequisite: for non-music majors: prior consent of instructor.

580-2 to 4 (2, 2) Graduate Composition. Composition in the larger forms for solo and ensemble performance. Required of all master's candidates specializing in composition. Individual instruction. Prerequisite: 480-4 or prior consent of instructor.

595-2 Music Document. A written report presenting 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.

598-4 Graduate Recital. Preparation and presentation of a full solo recital in any area of performance; or the preparation, rehearsal, and conducting of a full ensemble program or of the equivalent sections of several ensemble programs. Prerequisite: completion of at least four credits in 540 (or 556 for conductors) and the approval of the performance jury. The performance jury certifies the acceptability of the completed recital and the grade to the graduate committee.

599-2 to 6 Thesis. An intensive written study in the history, theory, teaching, or philosophy of music; or the manuscript and parts (with tape recording when feasible) of a substantial musical composition or series of compositions accompanied by an analytical or explanatory document. Prerequisite: 501 and prior approval of topic or proposal by thesis director and graduate committee in music.

Occupational Education

(SEE VOCATIONAL EDUCATION STUDIES)

Philosophy

400-3 Contemporary Mind. Analysis of thought-patterns and motivations dominating the American mind during the present decade of the 20th Century. Elective Pass/Fail.

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. Elective Pass/Fail.

420-3 Advanced Logic. Study of topics in logical theory and/or formal logic not treated in 320. Prerequisite: 320. Elective Pass/Fail.

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. Elective Pass/Fail.

426-3 Introduction to Mathematical Logic. (See Mathematics 426.)

432-4 Philosophy of Mathematics. (Same as Mathematics 432.) Philosophical problems of mathematics. Epistemological issues raised by non-Euclidean geometry. Representative writers on foundations, including nominalists, intuitionists, logicians and formalists. Ontological commitment, conventionalist theories of mathematical truth, logical paradoxes, and alternative set theories; significance of the theorems of Godel and Skolem-Lowenheim. Prerequisite: 320 or 15 hours mathematics. Elective Pass/Fail.

435-4 Scientific Method. Critical survey of influential descriptions of scientific method, with emphasis on natural sciences. Topics include statistical and inductive probability, crucial experiments, explanation and prediction, interpretation of scientific terms and sentences, role of reasoning in discovery, and value judgments in research. Elective Pass/Fail.

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 GSC 102 or consent of instructor. Elective Pass/Fail.

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. Elective Pass/Fail.

446-3 Philosophical Perspectives on Women. Survey of five different views of the relation of the concept of women to the philosophical concept of human nature. Elective Pass/Fail.

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. Elective Pass/Fail.

470-6 (3, 3) Greek Philosophy. (a) Plato; (b) Aristotle. Prerequisite: 304 or consent of instructor. Elective Pass/Fail.

471-4 Medieval Philosophy. Prerequisite: 304 or consent of instructor. Elective Pass/Fail.

472-4 The Rationalists. Study of one or more of the following: Descartes, Malebranche, Spinoza, Leibniz, Wolff. Prerequisite: 305 or consent of instructor. Elective Pass/Fail.

473-6 (3, 3) The Empiricists. (a) Locke; (b) Hume. Prerequisite: 305 or consent of instructor. Elective Pass/Fail.

474-9 (3, 3, 3) 19th Century Philosophers. (a) Kant; (b) Hegel; (c) Marx. Prerequisite: 306 or consent of instructor.

477-4 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 or original texts in English translation. Discussions and reports. Elective Pass/Fail.

478-4 Latin American Thought. Elective Pass/Fail.

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. Elective Pass/Fail.

486-3 Early American Philosophy. From the Colonial period to the Civil War. Elective Pass/Fail.

487-3 Recent American Philosophy. Thought of Howison, Royce, Peirce, James, Dewey and others. Elective Pass/Fail.

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 Classical Studies. (See Classical Studies 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.

510-3 Indian Philosophy. Schools, systems, or problems in Indian thought.

511-3 Chinese Philosophy. Confucianism, Taoism, or Buddhism. Emphasis on comparison of philosophy East and West.

512-3 Philosophy of Culture. Forms and assumptions of Eastern and Western philosophies.

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.

520-3 Logic. Recent advances in logic.

524-6 (3, 3) Analytic Philosophy. Analytic philosophy of men such as Austin, Ryle, Ayer, Carnap, 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.

550-3 Theory of Value. General theory of value or treatment of one or more philosophers on contemporary problems of value.

560-3 Aesthetics. Selected topics or writings.

562-3 Philosophy of Human Communication. (See Speech Communication 562.)

570-3 American Idealism. One or more American idealists. Recent seminars have been devoted to the thought of Brand Blanshard and Peter A. Bertocci.

572-3 20th Century Philosophy. Inception and development of *The Library of Living Philosophers* from Volume I on John Dewey to the present.

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 Dewey. (b) James and Mead.

581-3 Plato. Thorough study of several of the dialogues. Systems of Plato as a whole, discussions and reports on the readings.

582-3 Aristotle. Intensive reading of several texts, illustrating widely varied 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.

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.

403-2 Developmental Movement Experiences Designed for the Special Child. Movement performance as applied to children of special populations. Study of movement theory and its application to developmental needs and motor-perceptual performance.

404-2 The Teaching of Sports. Principles of learning applied to selected sports; progressions, teaching methods, and related summaries of research.

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.

410-3 Behavioral Foundations of Coaching. Behavioral problems of the athlete and the coach and possible solutions to such problems. Application of behavioral principles and theories as a basis for understanding the interaction between coach and student in the athletic 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.

416-3 Current Theories and Practices in the Teaching of Dance. (Same as Theater 416.) 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. All students will be expected to design and instruct a lesson under supervision of the instructor. Notebook required. Prerequisite: GSE 113d or Physical Education for Women 115h and 240.

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: GSA 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.

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. Written report required. Prerequisite: consent of adviser and department chairman.

494-2 (1, 1) Practicum in Physical Education. Supervised practical experience at the appropriate level in selected physical education activities in conjunction with class work. Work may be in the complete administration of a tournament, field testing, individual or group work with special populations, administration of athletics or planning physical education facilities. Prerequisite: consent of adviser.

500-3 Techniques of Research. Study of research methods and critical analysis of research literature specifically applied to the areas of motor performance and exercise. Prerequisite: consent of adviser and 400 or concurrent enrollment or equivalent.

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.

506-2 Topical Seminar in the Assessment of Motor Performance. Topics of importance in the techniques of assessment and in the understanding of the structure within the motor domain will be presented, studied, and discussed. Opportunity will also be provided for the individual to pursue the study of a special interest area. Prerequisite: 400 or 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.

510-2 Motor Development. Early patterns of motor behavior and the development of physical skills in childhood. The development of physical abilities during adolescence. Individual differences in motor proficiency and factors affecting the acquisition of motor skills. Concepts of motor development with inferences for improving instructional practices.

511-2 Analysis of Human Physical Movement. Basic human movements as performed by individuals of different ages analyzed. Understanding of movement mechanics at varying levels of skill analyzed. Additional material required. Prerequisite: 303 or equivalent.

512-2 Biomechanics of Human Motion. Methods of data collecting and analyzing the biomechanics of human motion under normal and pathological conditions are covered. Students complete a biomechanical study for a one segment motion.

513-3 Perceptual Motor Learning of Physical Skills. Principles of learning applied to motor performance. Variables that affect learning of physical skills.

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: Physical Education for Men 357 or Physical Education for Women 357 or equivalent.

520-3 Metabolic Analysis of Human Activity. Metabolic principles pertinent to human physical performance with emphasis on sport, exercise, and occupational activity analysis. A detailed study of oxygen utilization, oxygen debt, mechanisms of oxygen transport as they relate to physiological homeostasis in localized and total body motor activity. Emphasis on the laboratory study of aerobic and anerobic performance. Prerequisite: 420 or equivalent.

530-2 Seminar in Research in Motor Performance. Special problems in research design in motor performance, review of research in depth on topics of specific interest, presentation and evaluation of research proposals. Required for Ph.D. candidates. Prerequisite: 500 or equivalent and consent of instructor.

590-1 to 4 Readings in Physical Education. Supervised readings in selected subjects. Prerequisite: consent of adviser and department chairman.

592-3 Research Projects in Physical Education. Planning, conducting, and reporting original research studies. Four copies of paper required. Graded *S/U* only. Prerequisite: 500 or equivalent, consent of adviser.

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.

Physics and Astronomy

401T-1 Mechanics. Same as first half of Physics 401.

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. Elective Pass/Fail.

415T-2 Modern Physics. Same as 415B and second half of 430, offered during the second half of the fall semester (415A-3 quarter hours plus 415B-two semester hours equals 430-four semester hours).

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. Elective Pass/Fail.

424-2 Electronics. An introduction to electronic circuit design and applications for advanced undergraduate students of science. Basic vacuum tube and transistor circuits employing amplification, feedback, and rectification are studied, principally for small signals including noise and linear operation. Applications to power supplies, amplifiers, oscillators, and detectors used in research are emphasized. Prerequisite: 324 or consent of instructor. Elective Pass/Fail.

425-2 Physics of Modern Electronic Devices. Physical principles of the semiconducting, ultrasonic, and electro-optic elements used in modern electronics. Prerequisite: 324 or consent of instructor. Elective Pass/Fail.

428-2 Modern Optics. Advanced course in modern optics covering such topics as interference and interferometers, coherence, diffraction, holography, optics of solids, lasers, and non-linear optics. Prerequisite: 328 and 420. Elective Pass/Fail.

430-4 Modern Physics. Lectures on the experimental basis of modern physics. Introduction to quantum mechanics with emphasis on applications in atomic physics. Prerequisite: 310 and 320. Elective Pass/Fail.

431-2 Molecular Physics. Molecular spectra and structure. Prerequisite: 430. Elective Pass/Fail.

432-2 Nuclear Physics. Basic nuclear properties and structure; radioactivity, nuclear excitation, reactions; nuclear forces, and the two-nucleon problem; production and study of high energy particles and radiations. Prerequisite: 430. Elective Pass/Fail.

445-3 Statistical Mechanics. 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. Elective Pass/Fail.

450-1 Modern Physics Laboratory. Introduces the student to experimental research and encourages him to develop and carry out his own experiments. Prerequisite: 205c, either of 350 or 351, or consent of instructor. Elective Pass/Fail.

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. Elective Pass/Fail.

470-1 to 3 Special Projects. Each student chooses or is assigned to a definite investigative project or topic. Prerequisite: 310, 320. Elective Pass/Fail.

480-3 Topics in Classical Physics. Assists experienced teachers to improve their understanding of classical physics and the strategy of presenting it. Emphasis on demonstration of phenomena as basic strategy in the introduction to new material. Attention given to the design of demonstration apparatus. Related laboratory experience is an integral part of the course. Prerequisite: consent of department. Elective Pass/Fail.

481-3 Topics in Modern Physics. Assists experienced teachers to extend their understanding of modern physics. Lectures and demonstrations aim at improvement of the means of presenting the ideas of modern physics. Related laboratory experience is an integral part of this course. Prerequisite: consent of department. Elective Pass/Fail.

482-2 (1, 1) In-Service Institute for Teachers of Physics. A series of lectures, demonstrations, discussions and films to assist teachers of high school physics in meeting their classroom problems and responsibilities. Prerequisite: consent of department. Elective Pass/Fail.

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.
- 520-7 (4, 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.** 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.** 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.** 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.** 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.** 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 4 Special Projects in Physics.** Each student chooses or is assigned a definite investigative topic requiring resourcefulness and initiative. Prerequisite: consent of instructor.
- 571-6 (3, 3) X-Ray Diffraction and the Solid State.** (See Engineering Mechanics and Materials 504.)
- 575-2 to 4 Selected Topics in Physics.** Topics of special interest. Prerequisite: consent of instructor.
- 581-1 to 3 Graduate Seminar.** Lectures on special topics to be given when a demand arises. Prerequisite: consent of instructor.
- 599-1 to 6 Thesis.**

Physiology

- 401-10 (5, 5) Advanced Human Anatomy.** Dissection of the human body. Primarily for students with a major in physiology or other biological sciences. Two hours lecture, six hours laboratory per week. Prerequisite: due to limited facilities, permission of the instructor is required.
- 402-5 (3, 2) Concepts of Anatomy.** A detailed survey of human anatomy for pre-professional students with an interest in the biomedical disciplines, including radiographic, cross-sectional, and histological correlates. Three lectures per week fall semester, two lectures per week spring semester. Should be taken in a, b sequence. Not open to students who have had 401. Prerequisite: senior standing or consent of instructor.
- 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.
- 414-3 Anatomy and Physiology of Speech and Hearing Mechanisms.** (Same as Speech Pathology and Audiology 414.) Structure and function of the vocal apparatus and hearing. Primarily for students in speech pathology and audiology. Two hours lecture and one two-hour laboratory per week. Prerequisite: consent of instructor required for graduate students.
- 420-6 (3, 3) Principles of Pharmacology.** Action of drugs and other chemical substances on the living organism; pharmacodynamics, chemotherapy, toxicology, and therapeutics.

Pharmacologic action of analgesics, emetics and antimetics; pharmacology of the nervous system; pharmacology of the muscles; antihistaminics; drugs that affect the eye; drugs that combat infectious diseases. Two lectures and one two-hour laboratory per week. May be taken in any sequence. Prerequisite: organic chemistry and basic courses in biology, or consent of instructor.

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.

433-4 Comparative Physiology. Variations of physiological processes in animal phyla, and comparison of these with human physiology. Three lectures and one discussion period per week. Prerequisite: one year of biological science.

440-4 Biophysics. Applications of classical and modern physics in physiological studies, with emphasis on quantitative physical studies of physiological functions, effects of physical environmental factors, and use of physical techniques for physiological studies. Four lectures per week. Prerequisite: one year of college physics, one year of college biology.

460-2 Electron Microscopy. Lectures, demonstrations, and experience on specimen-preparation and use of the electron microscope. One lecture and one two-hour laboratory per week. Prerequisite: due to limited facilities, permission of the instructor is required.

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.

491-3 to 8 Independent Research for Honors. Supervised readings and/or laboratory research in physiology. Undergraduate honors students only. By special arrangement with the instructor with whom the student wishes to work.

492-1 to 3 Special Problems in Physiology. By special arrangement with the instructor with whom the student wishes to work. Open to undergraduates only.

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.

520-3 Advanced Endocrinology. Analytical techniques and studies in the field of endocrinology; current knowledge of the endocrine glands and hormones. Two lectures and one two-hour laboratory per week. Prerequisite: advanced standing in chemistry (including organic chemistry) and biology.

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. Current concepts and techniques in biophysics, with emphasis on biophysical modeling and theoretical biophysics. Two lectures and one two-hour laboratory per week. Prerequisite: 440 or equivalent.

560-2 Physiological Techniques. An overview of instruments and techniques used in physiological research. One lecture and one two-hour laboratory per week.

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 biology physiology, (i) Environmental physiology, (j) Biomathematics, (k) Biomedical computing, (l) Endocrinology, (m) Animal care, (n) Biophysics, (o) Pharmacology, (p) Special topics, (q) Reproductive endocrinology, (r) Renal physiology.

590-1 to 4 Readings or Research in Current Physiological Topics. By special arrangement with the instructor with whom the student wishes to work.

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.

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 latest developments in their area of specialty. Prerequisite: senior standing.
- 405-3 Plant Breeding.** Principles of plant breeding emphasized together with their application to the practical breeding of agronomic, horticultural, and forest plants. Field trip costs approximately \$5. Prerequisite: 305 or equivalent. Elective Pass/Fail.
- 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. Elective Pass/Fail.
- 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 \$5.00. 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 costing approximately \$5. Prerequisite: 220 or consent of instructor.
- 424-3 Floriculture.** Production, timing, and marketing of the major floricultural crops grown in the commercial greenhouse. Each student will have an assigned project. Field trip costing approximately \$25. Prerequisite: 423 or consent of instructor.
- 428-6 (3, 3) Advanced Landscape Design.** Theory and principles of residential landscape design. Practice in drawing residential landscape plans. (a) Emphasis on arrangement of unit areas. (b) Emphasis on details of design and selection of plants. Prerequisite: 328-4 or consent of instructor.
- 430-4 Plant Propagation.** Fundamental principles of asexual and sexual propagation of horticultural plants. Actual work with seeds cuttings, grafts, and other methods of propagation. Field trip costing approximately \$5. Prerequisite: 220.
- 432-4 Nursery Management.** Principles and practices involved in the propagation, production, and marketing of ornamental landscape plant materials. Emphasis on plant production with field trips to various production areas costing approximately \$40. Prerequisite: 220 and 327a or consent of instructor.
- 434-3 Woody Plant Maintenance.** Care and management of ornamental shrubs and trees commonly used in the landscape. Topics to include trimming, pruning, fertilization, transplanting and diagnosis of woody plant problems. Prerequisite: 327 or Forestry 201 and 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 costing approximately \$5. Prerequisite: 220 or consent of department.
- 441-3 Soil Morphology and Classification.** Development, characteristics, and identification of soils; study of profiles; and interpretation and utilization of soil survey information in land use planning. Field trip costing approximately \$5. Prerequisite: 240 or consent of instructor.
- 442-3 Soil Physics.** A study of the physical properties of soils with special emphasis on soil and water relationships, soil productivity, and methods of physical analysis. Prerequisite: 240.
- 443-3 Soil Management.** The soil as a substrate for plant growth. Properties of the soil important in supplying the necessary mineral nutrients, water and oxygen and for providing an environmental conducive to plant root system elaboration. Soil management techniques that are important in optimizing plant growth. Prerequisite: 240. Elective Pass/Fail.
- 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. Elective Pass/Fail.
- 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.

454-3 Microbial Processes in Soils. A study of the numbers, characteristics, and biochemical activities of soil micro-organisms, with particular consideration of their role in the transformations of organic matter, nitrogen, and minerals as related to soil fertility and management. The role of soil organic matter in interacting with fertilizers, pesticides, and environmental waste products is included. Prerequisite: 240 or one course in microbiology. Elective Pass/Fail.

460-3 Radioisotopes, Principles and Practices. Lectures on the principles of radioisotope technology as applied to agricultural and biological sciences. Prerequisite: general chemistry and biochemistry or equivalent.

468-3 Weeds — Their Control. Losses due to weeds, weed identification and distribution, methods of weed dissemination and reproduction, mechanical, biological, and chemical control of weeds. State and Federal legislation pertaining to weed control herbicides. Herbicide commercialization. Field trips costing approximately \$5. Prerequisite: an introductory biology course. Elective Pass/Fail.

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.

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.

560-3 Field Plot Technique. Design of field plot and greenhouse experiments including appropriate statistical analyses for each of the designs. Data interpretation and preparation of manuscript for publication in popular or scientific journals. Prerequisite: consent of instructor.

581-1 to 4 (1, 1, 1, 1) Seminar. Group discussion of and individual papers on subjects and problems relating to soils, field and horticultural crops, and other phases of the fields of plant and soil science.

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 chairman. 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.

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) Elective Pass/Fail.

404-6 (3, 3) History of Political Theory. (a) Ancient and Medieval theory, Plato to Thomas Aquinas; (b) Renaissance and Rationalist theory. Machiavelli to Edmund Burke. Prerequisite: 303 or consent of instructor. Elective Pass/Fail.

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: GSB 212 or consent of instructor. Elective Pass/Fail.

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. Elective Pass/Fail.

413-3 Modern Federalism. The structure and function of federal systems of government with emphasis on recent revisions in American federalism and comparison of the American federal structure with federalism in other nations. Elective Pass/Fail.

- 414-3 Political Systems of the American States.** The state level of government viewed with emphasis upon recent developments and current research. Prerequisite: 213. Elective Pass/Fail.
- 415-3 Urban Politics.** An examination of the environment, institutions, processes, and functions of government in an urban society with particular emphasis on current problems of social control and the provision of services in the cities of the U.S. Prerequisite: 213. Elective Pass/Fail.
- 416-3 Senior Seminar in Political Behavior.** Seminar for advanced undergraduate students to examine in depth such topics as political participation and influence (mass and elite), political conflict, political socialization and recruitment, political leadership. Graduate students not admitted. Prerequisite: 200 recommended. Elective Pass/Fail.
- 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. Elective Pass/Fail.
- 418-3 Political Communications.** (See Speech Communication 451.) Elective Pass/Fail.
- 419-4 Political Sociology.** (See Sociology 475.)
- 426-3 Politics of Social Welfare.** The Social Security Act and other legislation of major significance for the welfare and maintenance of the family, the handicapped, children, and other special groups. Their relationship to the legal structure of federal, state, county, township, and municipal welfare facilities and institutions with indications of economic and social consequences. Elective Pass/Fail.
- 427-3 The Politics of National Defense.** A comparative study of the political effects of arms developments and arms control, the use and influence of military force in modern society and the factors leading to national aggression and non-aggression. Elective Pass/Fail.
- 428-3 Government and Labor.** (See Economics 436.) Elective Pass/Fail.
- 429-3 Race, Ethnicity and Politics.** (Same as Black American Studies 445.) Analysis of race and ethnicity as significant variables in political life. Topics receiving attention include various forms of political participation, leadership behaviors, organizational development, political strategies, and the effect of law in producing social change. Comparative cross-national emphases will vary with the instructor. Prerequisite: GSB 212. Elective Pass/Fail.
- 433-8 (4, 4) 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: GSB 212. Political Science 330 is recommended. Elective Pass/Fail. (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: GSB 212. Political Science 433a is highly recommended. Students who plan to take this course should not take Political Science 332. Elective Pass/Fail.
- 435-3 Judicial Process.** An examination of the process by which judges in both trial and appellate courts at federal 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. Prerequisite: either 330, 332, 433, or consent of instructor. Elective Pass/Fail.
- 436-3 Administrative Law.** The procedural law of public agencies, particularly the regulatory commissions but also executive branch agencies exercising regulatory functions. The exercise of discretion and its control through internal mechanisms and judicial review. Prerequisite: an ability to read court cases; 340 also preferred. Elective Pass/Fail.
- 437-3 Jurisprudence (Theories of Law).** Major schools in legal thinking. Positive law and natural law. Idea of justice and concept of natural rights. Elective Pass/Fail.
- 441-3 Organization Theory.** Analysis of various approaches to organizational theory and public administration with emphasis on recent American literature in this field. Prerequisite: 340 or consent of instructor. Elective Pass/Fail.
- 442-3 Public Personnel Administration.** An analysis of some of the central problems encountered by the government executive in recruiting, maintaining, and developing personnel, such as political neutrality, leadership and motivation, career development, security regulations, and the role of personnel in policy planning and execution. Prerequisite: 340. Elective Pass/Fail.
- 443-3 Public Financial Administration.** An examination of the administrative problems connected with local and state revenues and expenditures in the United States. Prerequisite: 213. Elective Pass/Fail.
- 444-3 Policy Analysis.** An examination of basic concepts in the policy sciences, approaches

to policy analysis, applications to selected areas of policy and instruments of policy development. Elective Pass/Fail.

447-9 (3, 2, 2 to 4) Urban Planning. (See Geography 470a,b,c.) Elective Pass/Fail.

454-3 Comparative Urban Politics. Comparative analysis of urban political systems in the United States and other nations. Attention to the social environment, political structures, political processes, and public policies of selected urban areas. Prerequisite: none. 213 recommended. Elective Pass/Fail.

455-3 Comparative Public Administration. Administrative attitudes, behaviors, and institutions are compared on a topical basis in governments of Britain, Europe, the United States, Japan, and selected socialist, developing, and ancient states. Elective Pass/Fail.

457-3 Great Britain and the Commonwealth. The nature of the Commonwealth association and the politics of Great Britain and the "Old Commonwealth" countries: Australia, Canada, New Zealand. Prerequisite: none. GSB 250 recommended. Elective Pass/Fail.

458-3 Governments and Politics of Europe. A comparative study of the political systems of the major countries of Western and Central Europe. Prerequisite: none. GSB 250 recommended. Elective Pass/Fail.

459-3 Government and Politics of Soviet Russia. Dynamics of Soviet government and economy. Prerequisite: none. GSB 250 recommended. Elective Pass/Fail.

460-3 Governments and Politics of South Asia. Politics in India, Pakistan, Sri Lanka, Nepal. Prerequisite: none. GSB 250 recommended. Elective Pass/Fail.

461-3 Governments and Politics of Southeast Asia. Politics and governments of Burma, Thailand, Malaysia, North Vietnam, South Vietnam, Cambodia, Laos, Singapore, Indonesia, and the Philippines. Prerequisite: none. GSB 250 recommended. Elective Pass/Fail.

462-3 Governments and Politics of Vietnam. Development of nationalist and communist political groupings since the period of French domination. Role of the religious sects and the private armies. Analysis of the legal and political system of Vietnam. Prerequisite: none. GSB 250 recommended. Elective Pass/Fail.

463-3 Government and Politics of China. Internal political, economic, and social development of China. Prerequisite: none. GSB 250 recommended. Elective Pass/Fail.

464-3 Governments and Politics in the Middle East. The Arab states of the Middle East and Israel. Socialization and integration patterns, the traditional and revolutionary regimes, and regional cooperation and conflict. Prerequisite: none. GSB 250 recommended. Elective Pass/Fail.

465-3 Government and Politics of Sub-Saharan Africa. (Same as Black American Studies 465.) Government and politics of French, English, and Portuguese-speaking areas of sub-Saharan Africa, with particular reference to the decolonization process and the relations of African states with each other and with non-African countries. Prerequisite: none. GSB 250 recommended. Elective Pass/Fail.

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. Elective Pass/Fail.

467-3 Advanced Comparative Politics. Analysis of the comparative approach to the study of politics and the principal methods employed in this approach. Methodological and conceptual issues are presented in conjunction with basic political structures and processes. Prerequisite: GSB 250 or consent of instructor. Elective Pass/Fail.

471-3 Theories of International Relations. Systematic analysis of a variety of approaches which seek to explain the actions of nations. The realist and utopian traditions, ecological factors, decision-making processes, theories of conflict and integration, equilibrium and systems analysis will be covered among others. Prerequisite: GSB 270 or graduate standing. Elective Pass/Fail.

475-6 (3, 3) International Law. (a) Rules and practices governing the nations in their relations in peace and war. Prerequisite: none. GSB 270 recommended. (b) Investigation of special problems in international law. Prerequisite: 475a. Elective Pass/Fail.

477-3 The Making of American Foreign Policy. An advanced course dealing with the formulation and administration of American foreign policy. Prerequisite: none. GSB 378 recommended. Elective Pass/Fail.

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. Elective Pass/Fail.

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. GSB 270 or History 380 recommended. Elective Pass/Fail.

487-3 International Relations of the Middle East. Role of Middle Eastern countries in world affairs, international implications of Middle East conflicts, and strategic involvement of the U.S., Soviet Union, and other countries in the area. Prerequisite: none. GSB 270 recommended. Elective Pass/Fail.

488-3 International Relations of the Western Hemisphere. Emphasis on the interna-

tional 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. GSB 270 recommended. Elective Pass/Fail.

494-1 to 6 Honors Research. Directed research for senior government honors students. Not for graduate students. Prerequisite: consent of instructor and chairman. Students must have at least a *B* average in political science.

500-2 Research Methods—Introduction. Selected topics concerning the philosophy of knowledge, empirical and normative analysis, and a survey of methods of data acquisition in political science. Primarily for master's degree students.

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) Attitude measurement and scaling. Magnitude techniques; proximity techniques; interlocking techniques; unfolding techniques; rating scale techniques; indirect evaluation techniques, and statement endorsement techniques. Prerequisite: Mathematics 516a and b or equivalent. (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 political science. Topics explored in depth: simulation, graph theory, game theory, applied non-parametric statistics, multivariate analysis, sampling, attitude measurement (scaling) and other quantitative analytic techniques utilized by social scientists. Topics will vary with instructor. Prerequisite: 501A and B or consent of instructor.

503-3 Data Preparation and Management. Covers JCL, locking, file creation, data file, dictionarying, cleaning and management of data files, data transformation, and index-scale construction procedures. A research tool course not to be counted toward graduate degree requirements. Prerequisite: Computer Science 202 or permission of the instructor.

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: 501a,b or consent of instructor.

510-3 Proseminar 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.

511-3 to 6 (3, 3) Topical Seminar in American Politics. Topic will vary with instructor. Student should see Director of Graduate Studies for advance syllabus. Prerequisite: basic course, related training, or consent of instructor.

514-3 Seminar in American State Politics. Student should see Director of Graduate Studies of advance syllabus. Prerequisite: 414 or consent of instructor.

515-3 Seminar in Urban Politics. Student should see Director of Graduate Studies for advance syllabus. Prerequisite: 415 or consent of instructor.

516-3 to 6 (3, 3) Seminar in Political Behavior. Topic will vary with instructor. Student should see Director of Graduate Studies for advance syllabus. Prerequisite: basic courses, related training, or consent of instructor.

518-3 Seminar in Political Parties. Student should see Director of Graduate Studies for advance syllabus. Prerequisite: basic courses, related training, or consent of instructor.

521-3 Seminar in the Legislative Process. Student should see Director of Graduate Studies for advance syllabus. Prerequisite: basic courses, related training, or consent of instructor.

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.

540-2 Advanced Public Administration. Review of current state of public administration as a discipline and profession. Recent literature is examined in the light of administrative realities. Required of all M.P.A. candidates.

542-3 Planning and Budgeting Systems. Critical examination of developing approaches to public planning and resource allocation and techniques for program analysis and evaluation. Emphasis on practical application of such methods to the public sector.

544-3 Advanced Policy Analysis. Advanced exploration of concepts in the policy sciences with primary emphasis on evaluation of on going governmental programs. Course will involve participation in some form of applied project or exercise.

(3, 3) Topical Seminar in Public Administration. (a) Devoted to selected analytical techniques as applied in public administration. (b) In-depth study of selected problems of public administration. Prerequisite: 441 or consent of instructor.

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 or consent of instructor.

573-3 Seminar in International Organization. Student should see Director of Graduate Studies for advance syllabus. Prerequisite: 473 or consent of instructor.

575-3 Seminar in International Law. Student should see Director of Graduate Studies for advance syllabus. Prerequisite: r75a or consent of instructor.

577-3 to 6 (3, e) 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: consent of instructor.

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: consent of instructor.

593-2 Seminar on Teaching Political Science. Designed to introduce the students to a variety of instructional philosophies, methods, source materials, audio-visual aids, and evaluative techniques appropriate for the teaching of political science at the college level. Open to all graduate students and required of each graduate student appointee and special doctoral assistant at the earliest offering of the course after the student is awarded financial assistance. Graded *S/U* only.

595-1 to 6 Internship in Public Affairs. Fieldwork in the office of a governmental agency; city, county, state, national, or international. Under certain circumstances it might be in the office of a political party organization or in that of some organized pressure group. The type of internship and the place and organization in which it is taken must be mutually satisfactory to the student and the department. A paper in which the student correlates his academic knowledge with his practical experience is required. Prerequisite: consent of department.

599-1 to 6 Thesis. Maximum of six hours to be counted toward a degree. Prerequisite: consent of instructor.

600-1 to 36 (1 to 16 per semester) Dissertation. Minimum of 24 hours to be earned for the Doctor of Philosophy degree.

Psychology

404-3 Theories of Perception. An examination of the different theories concerned with an organism's sensory contact with his environment. Physiological, social, and organizational theories of perception will be considered. Prerequisite: 211 or consent of instructor.

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.

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.

415-4 Psychopharmacology. A survey of the effects of drugs on the normal and abnormal

- behavior of humans and animals. A primary focus is upon understanding drug influences on behavior in relation to actions on the nervous and endocrine systems. Prerequisite: GSA 302, GSB 202. Elective Pass/Fail.
- 421-3 Psychological Tests and Measurements.** Introduction to test theory and test development. Detailed coverage of selected tests from such areas as intelligence, aptitude, and personality. Prerequisite: six hours of psychology.
- 431-3 Psychopathology.** Classification, description, etiology, and treatment of the disorders of personality organization and behavioral integration. Observations in a state mental hospital setting. Prerequisite: 305 or consent of instructor. Elective Pass/Fail.
- 432-3 Psychopathology of Childhood.** An extensive review and systematic evaluation of theories and research pertaining to the behavior disorders of childhood. Emphasis will be upon empirical data and the implications of these data for the classification and treatment of these disorders. Prerequisite: 301, and 211 or Guidance and Educational Psychology 422.
- 440-3 Theories of Personality.** A review and evaluation of major personality theories and their supporting evidence. Prerequisite: 30t or consent of instructor. Elective Pass/Fail.
- 451-3 Advanced Child Psychology.** An assessment of concepts, methods, and research techniques within selected topic areas of developmental psychology. Prerequisite: 211 and e01, or consent of instructor.
- 459-3 Theory and Practice in the Preschool.** Designed for those interested in the education of the preschool-aged child. Examines a variety of topics and provides lectures, demonstration, and practicum experience in the Child Study Cooperative Nursery. Prerequisite: consent of instructor.
- 461-3 Advanced Social Psychology.** Examines in depth current research in experimental social psychology. Emphasis is placed on topics such as person perception, interpersonal attraction, attitude formation and change, social influence, group processes, intergroup conflicts. Not for psychology graduate students. Prerequisite: 211, 307.
- 489-1 to 12 Seminar: Selected Topics.** Varied content. Offered as need exists and as faculty interests and time permit. Prerequisite: consent of instructor.
- 509-3 Motivation and Reinforcement in Learning.** Surveys the current experimental and theoretical literature in the areas of simple classical and instrumental conditioning, with emphasis on the parameters of reinforcement and motivation which affect the acquisition, maintenance, and persistence of learned responses in nondiscrimination paradigms. Prerequisite: consent of instructor.
- 510-3 Stimulus Control of Behavior.** Reviews of current literature in the areas of stimulus generalization, transposition, and simple and complex discrimination learning. Major emphasis is placed on the competing models of stimulus control as explained by uniprocess and duoprocess (i.e., attention) theories. The perceptual variables which affect stimulus control are also examined. Prerequisite: consent of instructor.
- 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 Physiological Psychology.** Lecture and laboratory. A survey of the field. Subjects covered include structure and function of the nervous system, neurological disease, sensorimotor physiology, sleep and waking, hunger and thirst, sexual behavior, the emotions, psychopathology, reinforcement, and learning and memory. Prerequisite: 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.
- 522-11 (4, 4, 3) 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; (c) Bayesian methods of inference with frequency and measurement data. Prerequisite: Mathematics 111b or consent of instructor.
- 523-2 Research Methods in Clinical and Counseling Psychology.** A discussion of the problems of experimental design, control, and analysis that are encountered by researchers in clinical and counseling 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 in 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.
- 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.
- 530-6 (3, 3) 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 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.
- 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.
- 540-3 Psychological Assessment.** Basic theory and practice, underlying assumptions and research data of psychological assessment. Attention given to a variety of assessment procedures, including observation, interviews, and tests of intelligence and personality. Prerequisite: psychology graduate or consent.
- 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.
- 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.
- 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.
- 556-2 Psychological Treatment of the Child.** Investigation of methods of psychotherapeutic intervention with children. Traditional and innovative approaches. Prerequisite: 451 or consent of instructor.
- 557-2 Family Psychotherapy.** Investigation of the psychosocial interior of the family.

Evolution and dynamics of interaction in families. Emphasis on methods of psychotherapeutic intervention with families. Prerequisite: graduate student and consent of instructor.

560-3 Social Psychology Proseminar. An introduction to social psychological theories, followed by an in-depth analysis of selected topics of current interest in social psychology. Emphasis in latter portion of course is on research methodology employed and pertinent theoretical issues. Prerequisite: consent of instructor.

564-3 Evaluations of Social Interventions: 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.

576-3 Human Engineering. Analysis of man-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: (e) Clinical Psychology; (f) Counseling Psychology, (h) Industrial Psychology; (j) Child Psychology; (i) 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.

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.

Public Visual Communications

The Department of Cinema and Photography and Radio-Television offer 400-level courses toward the Master of Arts degree in public visual communications.

500-3 Introduction to Public Visual Communications. Small group seminars in cinema, still photography and television. Through lectures, demonstrations, discussions and assignments, students are given work in research types and methods, aesthetic and critical theory and print and nonprint publication. 500 is prerequisite to all other courses in the Public Visual Communications program.

510-3 Researching and Developing Public Telecommunications Programming. Designed to train the advanced student in translating public issues into meaningful television programs. Includes organizing and editing results of research into public telecommunications program forms. Extensive reading and preparation of complete scripts. Prerequisite: 500.

530-3 International Telecommunications. Examination of various telecommunications systems of the world. Evolution, present status of these systems, and their probable future. Social, political, cultural, economic, geographic, and technological factors considered. Prerequisite: 500.

531-3 Seminar: Photographic Communication. Study of the public and personal uses of the photograph as a medium for art, communication, and persuasion. Examination of relevant theories of photographic communication. Students purchase texts. Prerequisite: 500.

532-3 Audience Communications Research. Techniques of general broadcast audience research and attitudinal research as it is used in the broadcast industry. Methodology of sampling, and the development of questionnaires to discover audience reactions and attitudes toward broadcast messages. Prerequisite: 500.

541-6 (3, 3) Seminar: History of Photography. Advanced study of the history of photography with emphasis on the development of technique and content. First semester will deal with works through World War II. Second semester will deal with works since World War II. Students purchase texts. Prerequisite: 500.

542-6 (3, 3) Seminar in Film History. Analysis of the films and ideas associated with a

particular director or a significant movement in motion picture history. Screening fee. Students purchase texts. Prerequisite: 500.

570-3 Public Telecommunications Program Analysis and Criticism. Development and applications of methods of analysis and critical criteria by which the content, esthetic elements, and forms of television programs might be objectively evaluated. Extensive reading in critical literature and critical analyses of selected television programs. Prerequisite: 500.

571-3 Regulation and Control of Public Communications. Study of the history of broadcast and film regulation and control. Case studies and research papers illuminate the problems solved. Prerequisite: 500.

572-4 (2, 2) Management of the Photographic Unit. Theory and practices of management in an internal photographic unit or commercial studio. First semester deals with management theory and analysis of various management practices. Second semester involves preparation by each student of a management survey and analysis of an existing unit or studio. Students purchase texts. Prerequisite: 500.

573-3 Public Telecommunications Management. An examination of regulatory, fiscal, programming, and personnel areas involved with the functions of management in local public television station operation. Independent readings and research papers. Prerequisite: 500.

575-3 Contemporary Film Theory. Analysis of film relativity, cinesemiotics, and structuralism. Students purchase texts. Prerequisite: 500.

580-2 Seminar: Current Trends in Public Telecommunications. Detailed examination of current trends affecting public telecommunications. Extensive reading. Social issues, economic pressures, and technological developments will be covered. Prerequisite: 500.

589-3 Seminar: Public Communications in a Dynamic Society. The study, processes and effects of communication through the public media, in historical perspective and in contemporary social problems. In-depth examination of responsible interrelationships of society with electronic, photographic, and film media. Prerequisite: 500.

591-1 to 6 (1 to 3, 1 to 3) Individual Study in Public Visual Communications. Supervised research or independent investigative projects. Area of study to be determined by student in consultation with Public Visual Communications faculty. Prerequisite: 500.

597-2 to 6 Production Seminar: Cinema, Photography, and Television. Individual or production-team projects in motion picture, photographic, or television production. Prerequisite: 500 and 24 hours of completed graduate work or consent of student's committee.

599-3 to 6 Thesis. Thesis requirements may only be satisfied by a traditional written thesis. A minimum of three hours and a maximum of six hours will be counted toward degree requirements. Prerequisite: 500 and 589.

Radio-Television

Graduate work in the Department of Radio-Television is offered toward 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.

430-2 Public Affairs and the Radio-Television Establishment. An examination of the history and scope of public affairs programming on radio and television. The effects of public affairs on programming and audiences. Prerequisite: C grade in 300M and 300P.

453-2 Public Broadcasting. The history and regulatory structure of 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 public broadcasting area also considered. Prerequisite: C grade in 300M and 300P; 308.

467-3 Radio-Television Production Survey. Production techniques and equipment for all phases of radio and television presentations for those who are not planning professional careers in broadcasting. Standards for equipment and facilities selection. Radio and television laboratory production projects. Prerequisite: non-major.

470-3 Documentary Film Production. For the student with a serious interest in the documentary film. Students work in teams researching, writing, filming, and editing films on subjects relating to historical, cultural, or social issues. Prerequisite: C grade in 300M, 300P, and 370 or C grade in Cinema and Photography 355 and 356 and consent of instructor. Mandatory Pass/Fail. Graduate students must take on letter grade basis.

481-2 ITV Administration, Production and Utilization. Development of ITV production with emphasis on the use of instructional objectives, the relationship of users' manual to the instructional series, and the functions of various personnel in the administration of instructional television. Prerequisite: C grade in 300M and 300P.

483-3 Advanced Radio-Television Writing. Exercises in writing broadcast manuscripts

including documentary, drama, and childrens' programming. Prerequisite: C grade in 300M, 300P, and 383; 340.

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 to 6 (3, 3) Independent Study. Area of study to be determined by student in consultation with radio-television graduate faculty. Prerequisite: C grade in 300M and 300P and consent of instructor.

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.)

450-3 Performing Arts in Education and Recreation. Principles, materials, and techniques of producing all types of drama, music, and dance activities for a variety of recreation and education settings and population groups. Prerequisite: consent of instructor.

460-3 Community and Institutional Recreation for Special Populations. 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, 305n and 315.

470-2 School and Community Recreation. The role of the public schools in community recreation. Emphasis on current practices and trends in curriculum content, adult education, extracurricular activities, after-school and vacation programs, and cooperative programs with other agencies. Prerequisite: 300, 305, and 315.

475-1 to 24 (1 to 2 per topic) Recreation Workshop. Critical examination and analysis of innovative programs and practices in one of the following areas: (a) commercial, (b) student centers, (c) outdoor education, (d) outdoor recreation, (e) mentally retarded, (f) emotionally disturbed, (g) teen centers, (h) family, (i) aging, (j) prisons and detention centers, (k) physically handicapped, (l) budget and finance, and (m) playground leadership, (n) Maintenance of Areas and Facilities. 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.

490-2 to 12 Internship in Recreation. Supervised practicum experience in a professional setting. Emphasis on administrative, supervisory, teaching, and program leadership in (A) Park and Community, and (B) Special Population settings. A maximum of 12 hours may be earned in A or B or a combination of the two. For undergraduate credit only. 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.

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.

540-3 Planning Outdoor Areas for Education and Recreation. An examination of master plans for outdoor areas used in school and recreation programs. Principles of master-planning and practical experience with the master plan will be correlated. Prerequisite: 500 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.

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 the department.

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.

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.

406-3 Introduction to Behavior Modification. A survey of the principles and procedures in behavior modification and the scope of its application to human needs and problems.

409-3 Scientific Methods in Behavior Analysis. A general review of philosophical issues and methodological approaches to the study of human behavior, includes sampling procedures, group statistical designs and single-subject multi-manipulation and multi-replication tactics. Prerequisite: consent of department.

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 man 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: 400 or 501.

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.

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.

445-2 to 12 Rehabilitation Services with Special Populations. (Same as Black American Studies 455.) Procedures and programs pertinent to the care and treatment of special populations. Two semester credits will ordinarily be granted for each unit.

(a)-6 (2, 2, 2) **Aging.**

(b)-6 (2, 2, 2) **Alcohol and Drug Abuse.**

(c)-6 (2, 2, 2) **Economically Deprived.**

(d)-6 (2, 2, 2) **Emotionally Disturbed.**

(e)-6 (2, 2, 2) **Genetically Disabled.**

(f)-6 (2, 2, 2) **Juvenile Offender.**

(g)-6 (2, 2, 2) **Mentally Retarded.**

(h)-6 (2, 2, 2) **Physically Handicapped.**

(i)-6 (2, 2, 2) Public Offender.

(j)-6 (2, 2, 2) Sensory Disabled.

(k)-6 (2, 2, 2) Developmentally Impaired. Prerequisite: consent of instructor.

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.

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.

479-0 to 2 Technical Writing in Rehabilitation. Fundamentals of writing skills applicable to special areas of concern to rehabilitation specialists, namely: writing journal articles, drafting program/grant proposals, and preparing news releases, and program/evaluation reports.

490-1 to 6 (1 to 3 per semester) Readings in Rehabilitation. Supervised readings in selected areas. Prerequisite: consent of instructor.

494-1 to 12 Work Experiences in Rehabilitation. Rehabilitation 494 and 594 both cannot be counted for graduate degree, only one or the other can satisfy requirements toward a master's degree. Elective Pass/Fail.

501-2 Rehabilitation Foundations. Underlying processes and concepts of rehabilitation practices. 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.

513-1 to 3 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.

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.

531-3 Individual Assessment Procedures in Rehabilitation. Through 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.

533-2 Vocational Appraisal. Consideration of the information compiled from interviews, tests, questionnaires, biographies, observations, and other diagnostic techniques in the vocational assessment and planning of vocational rehabilitation services. Prerequisite: consent of instructor.

543-3 Child Behavior. A systematic analysis of the genetic and environmental determinants of childhood behavior. Emphasizes learning 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. (Same as Psychology 534.) 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.

555-2 Contingencies of Reinforcement. Emphasis placed on research into human performances on various reinforcement schedules, and the relevance of these scheduled to human and social needs. Prerequisite: consent of instructor.

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.

564-3 School Related Behavior. Analysis of student and teacher behavior and the be-

havioral methods of improving teaching and learning. Prerequisite: 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.

572-1 to 3 Volunteer Administration and Programming. Practice of developing, organizing, and programming volunteer activities in the human services. Prerequisite: consent of department.

573-2 to 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: consent of instructor.

575-2 Case Management and Reporting. 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.

577-1 to 2 Behavioral Apparatus. Utilization of various electronic devices (standard and constructed) to record, measure, and control behavior in research and applied settings. Prerequisite: consent of instructor.

579-3 Advanced Fiscal Management in Rehabilitation. Application of funds and functional accounting in rehabilitation to include fiscal reporting and record keeping, fiscal planning, and management in rehabilitation. Prerequisite: 570 and 573.

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 Modification. 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.

591-1 to 6 Independent Projects in Rehabilitation. Systematic readings and development of individual projects in pertinent rehabilitation areas. Prerequisite: consent of instructor.

593-1 to 6 Research in Rehabilitation. Systematic investigation of factors and procedures relevant to rehabilitation. Prerequisite: consent of instructor.

594-1 to 12 Practicum in Rehabilitation. Supervised experiences in agencies in rehabilitation. (a) Administration. Rehabilitation facilities management/supervision, in planning, programming and evaluation. (b) Behavior Modification. Application of behavioral analysis/methods in human treatment and in management. (c) Counseling. Development of counseling skills with individuals and groups to include work related functions. Prerequisite: consent of department.

595-1 to 12 Internship in Rehabilitation. Extended practice in rehabilitation settings cooperatively guided and supervised by agency staff and university faculty. Prerequisite: 594 and consent of department.

599-1 to 6 Thesis. Prerequisite: consent of instructor.

Religious Studies

There is no graduate program offered through religious studies. Four-hundred-level courses in this unit may be taken for graduate credit unless otherwise indicated in the course description.

410F-3 Comparative Religion. (See Anthropology 410F.)

430-4 Religious Traditions of Southern Illinois. Intensive study based upon field experiences in the religious (popular and traditional) of Southern Illinois. Not for graduate credit.

441-3 Themes in Greek Tragedies and the New Testament. (See Classical Studies 441.)

496-1 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.

Social and Community Services, Division of

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 Race and Politics. (See Political Science 429.) Not for graduate credit.

455-2 to 12 Rehabilitation Services with Special Populations. (See Rehabilitation 445.)

465-3 Governments and Politics of Sub-Saharan Africa. (See Political Science 465.) Not for graduate credit.

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 the black experience directed toward practical contributions in the area studied. Topics vary with instructor. May be repeated once for a total credits provided registrations cover different topics. Topics announced in advance. Prerequisite: GSB 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.

Community Development

401-3 Introduction to Community Development. This survey course is designed to provide a general understanding of community development. It includes an analysis of the history, values and techniques of various approaches to community development and explores some of the specific social issues and problems which confront community development practitioners. Elective Pass/Fail.

402-3 Comparative Community Development. Surveys the historic, economic, organizational and other aspects of international community development programs under the auspices of world and regional agencies or of multi-national, national or local sponsorship, focusing primarily upon specific case studies. Elective Pass/Fail.

403-3 Citizen Roles in Human Services. Examines citizen and consumer participation in human services delivery in four major areas: government-sponsored agencies, advocacy organizations, para-professional services and professionally staffed volunteer agencies. Concepts of citizen participation, history and dynamics of consumer movements, case studies. Elective Pass/Fail.

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. Elective Pass/Fail.

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.

491-1 to 6 Independent Study in Community Development. Supervised individual study and projects in fitting with the needs of each student. Prerequisite: consent of instructor. Elective Pass/Fail.

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. Elective Pass/Fail.

500-3 Research Seminar in Community Development. Flexibility designed to help meet the needs of students planning individual research projects, especially terminal research projects or master's theses.

501-4 Small Group Process in Community Development. A combination of theory and experiential laboratory. Focuses on *how to work* in small groups. Examines small group processes, including: informal personal interaction, formal problems-solving and decision-making, problems of communication, authority, establishing and reaching goals utilizing resources, and evaluating outcomes.

502-3 Community and Change. Attempts to create a conceptual understanding of the mechanisms of planned change at the community level. Conceives community as a political system and the planning of change as a political process. Micro-macro links and changing patterns of community in the United States and elsewhere are explored. Empirical investigation of planned change experiences, analysis of careers and evaluation of change decisions.

503-3 Problems of and Approaches to Community Development. Focuses upon a range of community development problems, models and practical skills. Observation of field consultants, community organizers and agencies, and persons skilled in and programs demonstrating distinctive approaches to community development. Prerequisite: 401.

589-2 Professional Seminar in Community Development. To prepare student for supervised field internship experience. Must be taken concurrently with (or as a prerequisite to) 595, Internship.

593-1 to 6 Individual Research in Community Development. Enables an advanced student to do independent study in community development under the supervision of a faculty member or to pursue work on a terminal research report or advanced field project. Prerequisite: 500 and consent of instructor.

595-1 to 8 Internship. Five hours required for M.S. degree in community development; part-time (50 clock hours per hour of credit) supervised field experience in an approved setting to develop mastery of appropriate skills; student expected to demonstrate personal and professional growth and to increase ability to reflect upon and conceptualize the field experiences. Graded *S/U* only. Prerequisite: 589 or concurrent enrollment and consent of field adviser.

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 chairman.

Social Welfare

There is no approved graduate program in social welfare. Four-hundred level courses may be taken for graduate credit unless otherwise indicated in the course description.

401-4 Processes in Social Work (Casework). Analysis of generic base of social work, of theory, rationale, and practice of casework. Prerequisite: 375.

402-3 Processes in Social Work (Social Group Work). Analysis of social group work, community welfare organization methods, and interventive techniques. Not for graduate credit. Prerequisite: 375.

404-3 Integrated Methods in Social Work. A seminar approach to exploring the interrelationship of casework, groupwork, and community work in synthesizing a gestalt impact on intervention and problem-solving techniques. Not for graduate credit. Prerequisite: 441, 442 or concurrently with 442.

411-3 Methods of Social Research. Principles and methods of scientific inquiry applied to social work research and practice. Required for undergraduates. Not for graduate credit. Prerequisite: 375.

416-3 Human Behavior and the Social Environment. A social systems approach to the study of human development and behavior. Examination of environmental forces impinging on the individual and implications for social work practice. Prerequisite: 375 and at least one approved upper division course in psychology, sociology and political science. Open to College of Human Resources majors only.

421-3 Seminar in Problems and Issues in Social Welfare. Critical evaluation of contemporary social work practice, innovations, social policy, and planning. Prerequisite: 401, 402, 441, 442 or concurrently with 442.

426-2 Comparative Social Welfare Systems. An examination of social welfare policies

- and practices in other countries and by international organizations. Prerequisite: 375.
- 441-7.5 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, 401, 402, and a 2.5 grade point average in departmental prerequisites. Mandatory Pass/Fail.
- 442-7.5 Advanced Field Practicum.** Supervised field work experience in an approved social service agency with concurrent 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, 401, 402, and a 2.5 grade point average in departmental prerequisites. Mandatory Pass/Fail.
- 451-2 Seminar in Social Casework.** A problem-solving approach based on case studies aims to explore alternate methods in counseling of individuals and families. Prerequisite: consent of instructor.
- 452-2 Seminar in Group Treatment.** Study of theory and practice in social group work covering various methods of group treatment interventions. Prerequisite: consent of instructor.
- 453-2 Seminar in Community Work.** Study of variety of strategies of intervention in agency and grass roots decision-making processes leading to social change through citizen participation. Prerequisite: consent of instructor.
- 461-2 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. Prerequisite: consent of instructor. Elective Pass/Fail.
- 462-2 School Social Work.** Organization, development, and administration of school social work. Referrals for school social work services. Functions and responsibilities related to pupil personnel services. Evaluation, school placement, remedial procedures, cooperation with home and community agencies. Prerequisite: consent of instructor.
- 463-2 Social Work with the Aged.** Basic concepts of social work methods applied to the older adult group. Characteristics of the aged group, its needs and potentials. Social trends and institutions involved in services to the aged. Prerequisite: permission of instructor.
- 464-2 Public Welfare.** Social work knowledge, values, and techniques in public assistance. Care and rehabilitation of the public welfare client affected by social problems and social change. Prerequisite: consent of instructor.
- 465-2 Strategies in Health and Mental Health.** A survey of current legislative and service trends in health programs under governmental and voluntary auspices. Preventive and restorative concepts will be explored in relation to chronic disease, aged adults, maternal and child health, and community health services. Role of social workers as an integral part of the medical and psychiatric case system. Prerequisite: consent of instructor.
- 496-1 to 6 Independent Research in Social Welfare.** Not for graduate students. Prerequisite: consent of instructor.

Sociology

- 406-4 Social Change.** Theories and problems of social change; their application, with emphasis on the modern industrial period. Prerequisite: 301 or consent of instructor. Elective Pass/Fail.
- 415-3 Logic of the Social Sciences.** (See Philosophy 415.)
- 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. Prerequisite: 301 or consent of instructor. Elective Pass/Fail.
- 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. Prerequisite: 301 or consent of instructor. Elective Pass/Fail.
- 435-4 Social Stratification.** A comparative study of social class systems, with emphasis on the American system. Relationships of class position to behavior in family, religion, politics, etc. Prerequisite: 301 or consent of instructor. Elective Pass/Fail.
- 437-4 Sociology of Rural Development.** Rural development and rural social problems in the United States and other countries. Concepts of rural and urban, developed and underdeveloped, characteristics of rural populations and institutions; rural development analyzed functionally and historically. Prerequisite: 301 or consent of instructor. Elective Pass/Fail.
- 450-4 Social Thought.** Traces of historical development of sociology from its beginnings in the Enlightenment to the classical expositions of the early 20th Century. Prerequisite: 301 or consent of instructor.
- 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. Prerequisite: 301 or consent of instructor. Elective Pass/Fail.

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. Prerequisite: 301 or consent of instructor. Elective Pass/Fail.

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 Demography and Human Ecology. The demographic portion surveys general theory and techniques of population analysis, with emphasis on contemporary research in mortality, migration, fertility, and problems of world population growth and distribution. The ecological portion summarizes human ecology from the classical Chicago school to current research on sustenance organization and the division of labor. Prerequisite: 301 or consent of instructor. Elective Pass/Fail.

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: 301 or consent of instructor. Elective Pass/Fail.

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. Prerequisite: 301 or consent of instructor. Elective Pass/Fail.

497-4 Senior Seminar. Contemporary issues in sociology and the analysis of these issues. Prerequisite: senior standing with 20 hours in sociology (including 301), or consent of instructor. Elective Pass/Fail.

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. Elective Pass/Fail.

498H-1 to 4 Honors Independent Research. Advanced research study of a problem. Not for graduate students. Prerequisite: senior standing with 20 hours in sociology (including 301) and consent of department and honors standing. Elective Pass/Fail.

501-4 Survey of Sociological Theory. From synthetic philosophy to analytic sociology: the development of sociology as a science of society, with special considerations of the major schools and trends.

502-4 Seminar on Theoretical Systems in Sociology. Concentrated, in-depth analysis of selected theoretical systems in sociology. Topic will vary by agreement of participants. Prerequisite: admission to doctoral program in sociology or consent of instructor.

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.

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.

522-4 The Sociology of Small Groups. The study of the small group as a small-scale social system. The interrelationship between selected patterned properties of groups such as interaction, emotion, norms, beliefs, values, and myths as the group encounters and attempts to deal with basic problems of group development. Prerequisite: 426 or consent.

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 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.

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.

566-4 Sociology of the Community. A detailed analysis of theories and methods of research which have the community as their unit of analysis. Both case studies and comparative approaches will be included, and both rural and urban communities will be considered. Prerequisite: two sociology courses or 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.

574-3 to 4 Seminar in the Sociology of Education and Science. An international and comparative perspective. Focus on various topics in the sociology of education and science.

591-1 to 4 Individual Research—Supervised Research Projects. Open to graduate students with a major in sociology. Credit according to achievement. Prerequisite: consent of instructor and chairman of department.

596-1 to 8 Readings in Sociology. Supervised readings in Selected subjects. Prerequisite: consent of instructor and chairman of department.

599-1 to 6 Thesis. Prerequisite: consent of chairman.

600-1 to 32 (1 to 16 per semester) Dissertation. Prerequisite: consent of chairman.

Special Education

400-3 Introduction to Special Education. Physical, mental, emotional, and social traits of all types of exceptional children. 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 Child. Diagnosis, screening, classroom management, placement considerations, goals, and the effective use of ancillary services for school children who are emotionally disturbed and/or socially maladjusted. Emphasis on the understanding of maladaptive behavior through principles of learning and behavior. Prerequisite: 400 or concurrent enrollment or consent of department chairman.

402-2 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 chairman.

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 chairman.

404-3 Problems and Characteristics of the Learning Disabled Child. Behavioral, emotional, physical, and learning characteristics of children 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 chairman.

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 chairman.

406-2 Characteristics of the Severely Handicapped Child. Provides the basic developmental, psychological, intellectual, and curricular background essential to students wishing to teach in this area of special education. The course requires 30 hours of lecture and 15 hours of lab with severely handicapped children. Students will be video-taped for self critique and progress evaluation. Prerequisite: 400 or consent of department chairman.

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 chairman.

411-3 Assessment and Planning for Remediation in Special Education. Theories of special tests and development of remedial programs for children with special learning problems. Purchase of testing materials costing approximately \$5 is required. No text is required. Prerequisite: 400 and consent of department chairman.

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 of \$5 for testing materials is required. No textbook is required. Prerequisite: 400 and 405.

417-2 Methods and Materials for Teaching Behaviorally Disordered Children at the Elementary Level. 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: 411, concurrent enrollment in Education 312 and Education 400.

418-2 Methods and Materials for Teaching Educable Mentally Handicapped Children at the Elementary Level. Psychoeducational strategies for teaching the educable mentally handicapped child. Prerequisite: 411, concurrent enrollment in Education 312 and Education 400.

419-2 Methods and Materials for Teaching Learning Disabled Children at the Elementary Level. Psychoeducational strategies used in teaching children with learning disabilities. Prerequisite: 411, concurrent enrollment in Education 312 and Education 400.

421-3 Methods and Materials for Teaching Pre-School or Elementary Severely Handicapped Learners. Emphasis on methods of teaching those with severe handicaps. Minimum of one video-taping session, and individualized tutoring, are required of all participants. Prerequisite: 411 or 412; concurrent enrollment in Education 312 and Education 400.

423-2 General Procedures in Special Education. Deals with methods, materials, and instructional management practices common to the instruction of the handicapped. Prerequisite: 411 or 412; concurrent enrollment in Education 312.

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 chairman.

430-2 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 his maximum vocational adequacy. Prerequisite: 400 and one of 401, 402, 404, or 406; concurrent enrollment in Education 312.

456-4 (2, 2) Music for Exceptional Children. (See Music 456.)

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 and to graduate students. Prerequisite: 400 and consent of department chairman.

500-3 Special Education Research Problems. Research design and methodology in special education. Prerequisite: consent of instructor.

502-2 Special Education Research Paper. Development and performance of research study under direction. Prerequisite: 500, consent of instructor.

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 student 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 chairman.

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 selected and training of teachers, problems of supervision, special equipment, transportation, cooperating agencies, and legal aspects of the problem. Prerequisite: 400, 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: 410a,b,c,e; consent of instructor.

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.

518-2 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 chairman. Graded *S/U* only. Prerequisite: 400 and consent of instructor and department chairman.

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 chairman.

582-2 Post-Master's Seminar: Remedial 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.

583-2 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.

584-2 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.

585-2 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.

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 chairman.

600-1 to 32 (1 to 16 per semester) Dissertation. Prerequisite: consent of chairman.

Speech Communication

Courses in this department may require the purchase of additional textbooks or materials.

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.

402-3 Empirical Research in Speech Communication. Principles of research design accompanied by a critical examination of research on oral communication. Prerequisite: 401 or consent of instructor.

421-3 to 9 (3, 3, 3) Studies in Public Address. Critical studies of speakers and issues relevant to social and political movements dominant in national and international affairs. A lecture, reading, and discussion course. Students may repeat enrollment to a total of nine hours. Prerequisite: for undergraduates, 311 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 sociological variables affecting language as it relates to school learning. Speech experiences supportive of the child's linguistic, intellectual, and social development.

431-3 Speech in Secondary School. Philosophy of speech education, and effective teaching of speech through curricular and extra-curricular work. Prerequisite: twelve hours of speech.

432-3 Secondary School Forensic Program. Designed to evaluate and plan the proper role of forensics in the secondary school and to prepare the students for their tasks as teachers and administrators in that program. Not for graduate credit. Prerequisite: 325, GSC 200.

433-3 Creative Dramatics for Children. Materials, techniques, and procedures for conducting sessions in informal drama with emphasis upon its contribution to the total growth and development of the child. Includes lectures, observations, student participation. Prerequisite: concurrent enrollment in 490f-1 or consent of instructor.

435-3 to 6 (3, 3) Topics in Creative Dramatics. An exploration of advanced theories and techniques for conducting sessions in informal drama. Topics vary and are announced in advance. Students may repeat enrollment in the course, since the topics change. Lecture, discussion, class projects, school visitations.

440-4 Language Behavior I. Psycholinguistic approach to the study of language learning and the early use of language. Theories and research in normal acquisition and development of grammatical structures, basic semantic categories, and rules of use in speech. Application of theories and research in first language learning to acquiring second languages.

441-4 Language Behavior II. Applicability of psychological and linguistic theories to social psychological aspects of speech communication. Relation of speech to other developing behaviors with particular attention to theories of cognition. Study of psychological and sociological variables affecting the functions of language for individuals and societies.

442-3 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.

443-3 General Semantics. Formulations from the works of Alfred Korzybski and from neo-Korzybskian interpreters are presented. General semantics is discussed as an interdisciplinary approach to knowledge. Relationships are made to contemporary problems in human affairs.

444-3 Language of Young Children. For teachers of young children and students of language. Theory of the development of language with attention to maturational and environmental correlates. Study of children's spoken language encoding and decoding behavior in relation to development of secondary skills of reading and writing and to general cognitive development.

445-3 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 non-verbal 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: 340 or 361 for undergraduates, 401 or 440 for graduate students, or consent of instructor.

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.

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 values and priorities of human nature and cultural nature.

465-3 Philosophy of Language. (See Philosophy 425.)

471-3 Oral Interpretation: Prose. The study of the prose form through analysis and performance. Prerequisite: 370, GSC 200 or consent of instructor.

472-3 Oral Interpretation: Poetry. The study of poetic form through analysis and performance. Prerequisite: 370, GSC 200 or consent of instructor.

474-3 Group Performance: Readers Theater. Theory and practice in constructing and staging the compilation script form. Prerequisite: 370, or consent of instructor.

475-3 Group Performance: Chamber Theater. Theory and practice in adapting and staging prose fiction. Prerequisite: 370 and 471, or consent of instructor.

480-3 Studies in Organizational Communication. Study of communication systems and behavior within organizations. Demonstrates the relevance of communication to management operations, networks, superior-subordinate relations, production, employee morale, and organizational climates through the study of theory and research.

481-2 Public Relations in Cases and Campaigns. Advanced course in selected case studies provided by the Public Relations Society of America and other sources. Student groups design actual or simulated public relations campaigns through the four steps of research, planning, communications, and evaluation. Prerequisite: 381 or consent of instructor.

490-1 to 6 Communication Practicum. A supervised experience utilizing communication skills in a professional or career setting. Emphasis on the development of applied performance skills in the following areas: (a) Public Relations, (b) Communication Studies, (c) Interpersonal Communication, (d) Oral Interpretation of Literature, (e) Forensic Activities, (f) Creative Dramatics, (g) Political Communication, (h) Organizational Communication, (i) Language Behavior, (j) Instructional Communication. May be repeated for credit. Undergraduates are limited to a total of six hours and graduate students to a total of three hours to be counted toward degree requirements. Prerequisite: consent of instructor and departmental adviser.

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.

502-3 Seminar: Empirical Communications Research. Review and analysis of types of quantitative research and methods of data collection most relevant to the study of human communication. Prerequisite: 402 or consent of instructor.

503-3 Seminar: Non-Quantitative Research Methods. Course encompasses the critical analysis of selected field and phenomenological research methodologies. Analysis includes examination of the assumptions, methods of observation, data collection, and interpretation germane to each methodology.

510-3 to 6 (3, 3) Seminar: Rhetoric and Communication. An analysis of selected theories of communication, public address, and rhetoric. Emphasis on major contributors of historical or contemporary importance. Students may repeat enrollment to a total of six hours.

526-3 Seminar: Studies in Persuasion. The study of persuasion in social-political contexts. Exploration of contemporary research and selected theories in persuasion. Examination of philosophical-ethical questions related to persuasion. Readings, research, and discussions.

531-3 Seminar: Speech Education. Advanced study of selected problems in speech communication instruction. Analysis of research problems and methodologies in speech pedagogy research. Topics may vary from year to year. Prerequisite: consent of instructor.

539-3 Speech Communication at University Level. Analysis and practice of instructional methods. Focus on the development of instructional skills with specific applications to teaching the basic college speech communication course.

540-3 Seminar: Language Behavior. Problems in language behavior research. Location and development of research topics, formulation of proposals, methods of conducting language behavior research. Prerequisite: 440, 441, or 530.

561-3 to 6 (3, 3) Studies in Small Group Communication. Studies of group action, interaction, and leadership designed to apply small group theory and communication theory. Emphasis on the nature of group communication as exemplified in the laboratory model or the discussion/conference model. Students may repeat enrollment to a total of six hours.

562-3 Philosophy of Human Communication. (Same as Philosophy 562.) Advanced

study of the philosophical theories and models utilized in the human sciences to analyze, describe, and interpret communication as a paradigm of expression and perception. Emphasis on the nature of persons, consciousness, and social exchange as discussed by such contemporary schools of thought as existential phenomenology, semiology, behaviorism, structuralism, critical theory, hermeneutics, and conceptual analysis. Prerequisite: 461 or 462, or Philosophy 482 or 425 (same as Speech 465), or consent of instructor.

571-3 Theoretical Perspectives in Interpretation. A study of the philosophical trends in contemporary interpretation theory, with emphasis on their historical development. Prerequisite: nine hours of interpretation or consent of instructor.

572-3 Critical Perspectives in Interpretation. An examination of the development of critical trends and an exploration of the critical process as it functions in the oral performance of literature. Reproduction fees: maximum \$3.00. Prerequisite: nine hours of interpretation or 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.

593-1 to 3 Research Problems in Communications. 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.

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.

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.

Speech Pathology and Audiology

401-3 Diagnostic Procedures in Speech Pathology. A general introductory course devoted to discussion of the role of the speech and hearing clinician as a differential diagnostician. Special emphasis is placed on correlating information obtained from the oral-peripheral examination, articulation and language evaluation, audiometric and case history information in constructing the initial evaluation report. Prerequisite: 200, 314.

407-2 Communicative Disorders: Cerebral Palsy. An introduction to cerebral palsy as a disorder, with an emphasis on etiology, problems, and approaches to therapy. Prerequisite: 205 314, or consent of instructor.

408-2 Communicative Disorders: Cleft Palate. An introduction to the ontology and teratology of cleft palate, problems of personal and social adjustments, and principles of therapy. Prerequisite: 205, 314, 318, or consent of instructor.

419-3 Communication Problems of the Deaf and Hard of Hearing. Objectives and techniques for the teaching of lip reading, speech conservation, and auditory training. Prerequisite: 316 or consent of instructor.

420-3 Basic Audiometric Evaluation. Principles and procedures of audiometric evaluation: pure-tone threshold testing; techniques and standards for clinical calibration of the audiometer; clinical masking procedures; materials and procedures for speech audiometry; hearing assessment of infants and children. Prerequisite: 316.

428-3 Speech and Language 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, psychophysiological methodology. Laboratory experience with various biofeedback instrumentation, EMG, EEG, temperature, ECG, etc. Open to nonmajors.

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.

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 chairman. Prerequisite: consent of chairman.

494-1 to 2 Clinical Practice: Phonological Disorders. Supervised clinical practicum in articulation. Emphasis will be upon therapy procedures, diagnostic techniques, and preparation of reports. Prerequisite: 302.

495-1 to 2 Clinical Practice: Language Disorders. Supervised clinical practicum in language. Emphasis will be upon therapy procedures, diagnostic techniques, and preparation of reports. Prerequisite: 303.

- 496-1 to 2 Clinical Practice: Hearing Disorders.** Supervised clinical practicum in hearing disorders. Emphasis will be upon rudimentary clinical procedures in audiology. Prerequisite: 316, 419, or consent of instructor.
- 497-1 to 2 Clinical Practice: Hearing Diagnostics.** Supervised clinical practicum in hearing diagnostics. Emphasis will be upon diagnostic techniques and preparation of reports. Prerequisite: 316 and 420.
- 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 Pathology and Audiology.** Physiological, acoustical, and biomedical recording, measurement and analysis of the speech encoder, decoder, and code for clinical and research applications. Prerequisite: 203 or consent of instructor.
- 505-3 Phonological Acquisition in Children.** An introductory discussion of the important linguistic, physiological, and acoustic variables which affect language production at the segmental and suprasegmental level of language; and a 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: consent of instructor.
- 507-3 Modern Techniques for the Syntactically Impaired.** 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.
- 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, equivalent, or consent of instructor.
- 512-2 Voice Disorders.** An intensive study of the variables of air stream modulation resulting from impaired structures and function of head and neck. Prerequisite: 318 or equivalent.
- 517-3 Psycholinguistic Correlates of Verbal Impairment.** Students will explore current theories of syntactical and semantic acquisition with an emphasis upon applicability to clinical research and methodology. A 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, 507.
- 521-3 Advanced Audiology II.** Theory and practice in the application of middle ear impedance measures, electroencephalographic audiometry, electrodermal audiometry, and electronystagmography. Prerequisite: 316.
- 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. Prerequisite: 316, 520.
- 526-3 Industrial and Community Hearing Conservation.** The nature of noise-induced hearing loss; methods of hearing protection; physiological and psychological effects of noise; methods of noise control and measurement; legal and economic aspects of community noise abatement; hearing conservation programs in industry and the community. Prerequisite: 316 or 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 consent of instructor.
- 529-3 Seminar: Experimental Audiology.** Basic psychophysical methods, basic operating principles of electronic equipment, and the use of laboratory sound-production and measurement equipment will be presented. Students will design and perform model psychoacoustic experimentation. Prerequisite: 316, 528 or consent of instructor.
- 533-3 to 6 (3, 3) Seminar: Speech Science and Experimental Phonetics.** Special problems in speech communication science. Students may choose from a wide range of topics, such as speech acoustics, kinesthetic perception of speech; voice print identification; artificial and compressed speech, air flow dynamics, etc. Students may pursue one or more topics in depth. Special instruction on group or individual topics chosen. May be repeated to total of six hours with different content.
- 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 Neuromuscular Disorders of Communication.** Will incorporate the study of the neurophysiology of the neuromotor system as well as the examination of information on

neural and muscular tissue. Differential diagnosis of dysarthria and verbal dyspraxia will be discussed. Therapeutic paradigms useful with neuromotor problems will be presented. Prerequisite: 314.

541-3 Neuropsychological Disorders of Communication. Will provide information relative to neurophysiology of psychological and other adaptive behaviors. Aphasia syndromes and appropriate diagnostic and clinical techniques will be reviewed. Prerequisite: 314.

544-3 Seminar: Phonology. 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: consent of instructor.

548-3 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.

550-3 Seminar: Speech Pathology and Audiology. 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. Prerequisite: consent of chairman.

590-1 to 4 (1 to 2 per semester) Readings in Speech 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 chairman.

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

594-1 to 2 Clinical Practice: Voice Disorders. Supervised clinical practicum in voice disorders; emphasis upon therapy procedures, diagnostic techniques, and preparation of reports. Prerequisite: 318 or equivalent.

595-1 to 2 Clinical Practice: Fluency Disorders. Supervised clinical practicum in fluency disorders; emphasis upon therapy procedures, diagnostic techniques, and preparation of reports. Prerequisite: 510.

596-1 to 2 Clinical Practice: Cerebral Palsy. Supervised clinical practicum in cerebral palsy; emphasis upon therapy procedures, diagnostic techniques; and preparation of reports. Prerequisite: 540 and consent of instructor.

598-1 to 3 Internship in Speech 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 chairman.

599-1 to 6 Thesis.

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

Theater

402-9 (3, 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 viewpoints. Textual analysis; establishing the groundwork for the director's approach to production. Prerequisite: junior standing; 207 and 217; or consent of instructor. (b) The principles of play direction including play selection, analysis, and patterning of auditory and visual elements of production. Extensive scene work in class; direction of a full one-act play by the end of the semester. Prerequisite: 402a or consent of instructor. (c) Extension of analytical and production skills to include non-proscenium and "style" plays. Students will direct two full one-act plays. Prerequisite: 402b. Courses must be taken in a, b, c sequence.

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.

409-3 High School Theater and Its Production Problems. Philosophy and analysis of basic needs of the high school theater. Consideration of all production elements with emphasis on play selection, casting, directing — artistic and technical.

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

conferences supplement the class discussion and analysis of student writing. Deserving plays have opportunity to be produced in the University Theater's Quarter-Night program for new plays. Prerequisite: one course in dramatic literature for non-majors and graduates; 311 for undergraduate theater and speech communication majors.

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 historical pageant-drama, the outdoor epic-drama, the musical etc.) In special cases, students may elect to write three short plays. Prerequisite: 411A or consent of instructor; none except 311 for theater and speech communication undergraduate majors. Elective Pass/Fail.

412-6 (3, 3) Stage Design. The design of settings for the stage and other dramatic media. Prerequisite: 207. Elective Pass/Fail.

414-3 Costume Design. History of western costume from Greek to Renaissance and its adaptation to stage use. Theory and principles of theatrical costuming. Application of principles of design and color. Designs for single scenes.

415-3 Costume Design. History of costume, Renaissance through 19th Century. Style, fantasy, and the comic in costume design. Principles of dramatic theory and criticism as applied to costume design. Evaluation of research tools. Methods and procedures in designing costumes for a complete show. Prerequisite: 414.

416-3 Current Theories and Practices in the Teaching of Dance. (See Physical Education 416.)

417-2 Advanced Acting: Advanced Scene Study. Problems in style; scenes from children's plays, Shakespeare, restoration; the understanding and playing of more complicated subtexts as in Chekhov, Pinter, Beckett, et al; continued application of 217 and 317. Prerequisite: 217 and 317.

418-2 Technical Direction. Advanced course in the management of technical production. Emphasis is placed on scene shop organization, building materials, stage equipment, and the role of the technical director. Lecture two hours. Prerequisite: 211A or consent of instructor.

427-3 Experimental Theater. Experimentation in production techniques: directing, acting, and mixed media. Prerequisite: permission of instructor.

432-2 State Lighting. An in-depth investigation of stage lighting theory, design, and practice. Emphasis is placed on creative design projects for the varied dramatic styles and media. Lecture two hours. Laboratory one hour. Prerequisite: 211B or consent of instructor.

438-3 Contemporary Developments in Theater. Critical study of theory and practice. Emphasis is placed on creative arts. Discussion of acting, direction, production, architecture in the modern theater and its relation to future trends. The rise and development of the film, radio, and television as dramatic media. Prerequisite: theater history or consent of instructor.

444-1 to 6 Contemporary Dance Workshop.

454-6 (3, 3) American Theater. (a) The study of the development of American theater and its environment from colonial times to the present. Primary focus is given to non-musical or dramatic theater. (b) A study of the development of the American musical theater from preminstrels through contemporary music-drama.

489-3 to 6 Theater-Television Workshop. (See Radio-Television 489.)

500-2 Introduction to Research Methods. An introduction to the principles and methods of scientific, historical, critical, and projective research in theater. Prerequisite: graduate standing.

502-3 to 6 (3, 3) Advanced Directing. Emphasis on individual directing problems. Workshop study in directing period plays, verse plays, music dramas, and arena productions (each of which presents a specific directing challenge). Plus research into and application of theories and practices of innovative directors of both past and present. Students will direct a full-length two or three act play. May be repeated for a total of six credits only by permission of instructor. Prerequisite: consent of instructor.

503-2 to 6 (2 per topic per semester) Advanced Technical Problems. Solutions of problems presented by certain types of plays and modes of production. (a) Scene design. (b) State lighting and sound. (c) Costume design. Each section may be repeated more than once. Maximum of six hours to count toward the master's degree. Prerequisite: consent of department.

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 and scenes are assigned.

505-3 The Tragic Theater. An examination of tragic drama and criticism as related to the societies which produced such drama. Particular emphasis is placed upon the Athenian, Elizabethan, and modern theater.

511-3 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 directing/acting 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 directing/acting students in the theater program. Prerequisite: graduate standing; theater major; 411a and b or 402b, 502, and 417; consent of instructor.

517-2 to 6 (2, 2, 2) Graduate Practicum in Acting. An advanced acting studio for graduate students which may be repeated for a total of six credits. Instruction in advanced rehearsal and performance problems. Prerequisite: 417 or equivalent and permission of instructor.

519-1 to 10 Theater Practicum. Practical experience in acting, directing, and associated work on campus, on area tours, and in summer stock. A maximum of ten hours may count toward a graduate program.

526-2 to 8 (2 per topic) Seminar in Theater Arts. Special problems of interest to advanced students. Subject is determined by the instructor. Areas: (a) Playwriting and Criticism. (b) Design and Production. (c) Acting and Directing. (d) History and Theory. Seminar in same area can be taken twice. Prerequisite: consent of department.

530-1 to 9 Research Problems in Theater. Individual work upon selected problems for research. No more than three hours may be taken in any given semester. Total number of hours (not to exceed nine hours) is subject to departmental approval.

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 by the instructor. Prerequisite: consent of department.

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.

Vocational Education Studies

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.

407-2 Records Administration. Methods and systems of controlling, storing, retrieving, and disposing of records. Application of principles to such records as medical, legal, educational, industrial, and governmental.

410-2 Principles and Problems of Business Education. A study of the fundamentals of business education; its relation to business, to general education, and to vocational and career education; its history, current status, and trends; special emphasis on objectives and curriculum problems.

411-2 Teaching Classes Related to Experiential Business Education. For those who plan to become teacher-coordinators of vocational cooperative education programs. Emphasis is placed upon the construction and presentation of subject matter and materials used to teach basic marketable skills to secondary and post-secondary students. Prerequisite: 210.

412-2 Teaching Data Processing. Instructional methods and materials for and the evaluation of pupil progress in data processing. Prerequisite: 306 or Electronic Data Processing 101 or equivalent.

416-3 Teaching Marketing Skills. The development of instructional materials and methods used to teach consumer or industrial product pricing; merchandise selection and control; salesmanship, advertising, and promotional sales skills. Prerequisite: Marketing 363.

417-3 Teaching Distribution Skills. The development of instructional methods and materials to develop high-level skills in product development, market segmentation, transportation modes utilization, product handling, and merchandise storage. Prerequisite: Marketing 341 or 452.

418-3 Teaching Distributive Education. For those who plan to become teacher-coordinators of vocational cooperative or in-school distributive education programs. Emphasis on the planning facilities; selection and review of course content; preparation of instructional materials; organization and arrangement of units; related instruction; simulated, block, and project plans; and student evaluation. Prerequisite: Marketing 304 and 363.

419-2 to 12 Occupational Teaching Internship. Experience in working with special intern and post-high school technical training programs in approved centers. The teacher will follow the program of the supervisors of the primary specialization in both regular and extra class activities. Prerequisite: 395-10 hours, 490-3 hours.

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.

430-3 Teaching Concepts and Generalizations in Home Economics. Use of cooperative teacher-pupil planning to develop curriculum based on subject matter concepts and generalizations. Techniques for helping students to take part in planning, implementation of learning experiences, and evaluation. Provides practice in use of group process to plan for sequential learnings. Prerequisite: consent of instructor.

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 \$5.00 to \$8.00.

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.

460-3 Vocational, Occupational, and Career Education Analysis and Curriculum Development. The first of a two-course sequence presenting a systems approach to curriculum development and instructional methods utilized in vocational, occupational, and career education. This course includes conducting job analysis, specifying objectives, and developing curriculum.

462-3 Vocational, Occupational, and Career Education Methods and Materials. The second of a two-course sequence presenting a systems approach to curriculum development and instructional methods utilized in vocational, occupational, and career education. This course is concerned with the unique instructional methods and material utilized in vocational, occupational, and career education.

464-3 Special Needs Learners in Vocational, Occupational, and Career Education Programs. 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, Occupational, and Career Education. Nature and purpose of vocational, occupational, and career education, their relationships and differences, and the place of each in preparing people for the world of work.

470-3 Introduction to Cooperative Vocational, Occupational, and Career Education. Investigation of competencies required of cooperative education instructors and coordinators.

472-3 Post-Secondary Cooperative Vocational, Occupational, and Career Education. Operational procedures and development of instructional processes for coop programs. Work experience required. Field trips. Transportation expense for work and field trips.

474-3 Individualized Instruction in Vocational, Occupational, and Career Education. Study of the theory, characteristics, appropriateness, and evaluation techniques of individualized programs. Will include a review of the current state of individualized instruction in vocational, occupational, and career education.

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.

480-3 Teaching Consumer Education. Principles of teaching consumer education in all settings. Emphasis on meeting state requirements for teachers of consumer education in Illinois. Selection and study of course content, preparation of instructional materials; organization and arrangement of units of study; and planning and evaluation program.

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 Post-Secondary Vocational-Technical Teaching. A study of contemporary approaches to the teaching of vocational education in post-secondary educational institutions. The course includes a review of practices in area vocational centers, vocational-technical institutes, community and junior colleges, colleges, and universities.

488-3 Vocational Student Placement and Follow-Up. The organization and operation of a comprehensive school-based placement system for secondary and post secondary vocational, technical, and adult education students. Utilization of resources with emphasis on planning, implementing, and evaluating the placement effort.

490-2 to 4 Vocational, Occupational, and Career Education Readings. Supervised reading for qualified students. (a) Agriculture education. (b) Business education. (c) Home economics education. (d) Occupational education. Prerequisite: consent of instructor and coordinator of program.

491-1 to 5 Advanced Occupational Skills. Modern occupational practice in selected

fields. For experienced professionals seeking advanced techniques in specialized areas of occupational education. (a) Agricultural education (b) Business education. (c) Home economics education. (d) Occupational education. Prerequisite: intermediate level study in the specialty.

494-1 to 4 Workshop in Vocational, Occupational, and Career Education. Study of current issues of interest to vocational, occupational, and career education teachers, supervisors, and administrators in the field. Emphasis of each workshop will be identified in each workshop announcement. (a) Agricultural education. (b) Business education. (c) Home economics education. (d) Occupational education.

495-2 to 12 Vocational, Occupational, and Career Education Teaching Internship. Experience in working with special intern and post-high school vocational, occupational, and career education training programs in approved centers. The teacher will follow the program of the supervisor of the primary specialization in both regular and extra class activities. (a) Agricultural education. (b) Business education. (c) Home economics education. (d) Occupational education. Prerequisite: 395—10 hours, 490—3 hours.

497-2 to 6 Vocational, Occupational, and Career Education Practicum. Applications of vocational, occupational, and career education skills and knowledge. Cooperative arrangements with corporations and professional agencies provide opportunity to study under specialists. (a) Agricultural education. (b) Business education. (c) Home economics education. (d) Occupational education. Prerequisite: 20 hours in specialty.

498-2 to 5 Special Problems in Vocational, Occupational and Career Education. Assistance and guidance in the investigation and solution of vocational, occupational, and career education problems. (a) Agricultural education. (b) Business education. (c) Home economics education. (d) Occupational education. Prerequisite: consent of instructor and coordinator.

511-2 Improvement of Instruction in Consumer and Basic Business Subjects. Designed for the experienced teacher who is interested in the study of curriculum and teaching problems in the consumer education and basic business areas. Deals with teaching procedures, instructional materials, tests and evaluation, and organization of teaching units and projects.

512-2 Improvement of Instruction in Secretarial Subjects. Designed for the experienced teacher who is interested in the study of curriculum and teaching problems in secretarial subjects. Deals with teaching procedures, instructional materials, tests, and evaluation. Prerequisite: 311 or 312 or 313.

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.

522-3 Supervision of Home Economics. Nature, function, and techniques of supervision at all levels. Emphasis given to supervision of student teachers.

561-3 Research in Vocational, Occupational, and Career Education. Basic research methods and techniques in the design, investigation, and reporting of research studies relating to vocational, occupational, and career education.

562-3 Legislation and Organization in Vocational, Occupational, and Career Education. Historical and contemporary thought and practice regarding federal and state legislation for vocational, occupational, and career education in sundry institutions. Legislators are used as resource persons. Required for supervisors.

564-3 Evaluation of Vocational, Occupational, and Career Education Programs. Student, faculty, and program evaluation. Accountability and measurement of stated learning outcomes. Assessing psychomotor behavior in addition to the more cognitive and affective domains. Development and construction of pertinent and effective evaluation instruments.

566-3 Administration and Supervision of Vocational, Occupational, and Career Education Programs. Nature, function, and techniques of administration and supervision of vocational, occupations, and career education programs at all levels.

568-3 Planning Vocational, Occupational, and Career Education Facilities. Principles and practices of planning classrooms and laboratories for vocational, occupational, and career education programs. How to work with administrators, staff, and paid professionals to assure judicious location and design of facilities.

570-3 Cooperative Vocational, Occupational, and Career Education Programs. Cooperative programs as they are developed in America, and especially in Illinois, are presented. Coordinators' duties and responsibilities along with the operation of

vocational, occupational, and career education cooperative programs are featured. Prerequisite: 470 or 472 or previous professional experience.

572-3 Post-Secondary Cooperative Vocational, Occupational, and Career Education Programs. Managing specialized occupational related cooperative programs, including work-study, internships, and clinical experiences in diverse post-secondary occupational education settings. Prerequisite: 470 or 472 or previous professional experience.

574-3 Vocational, Occupational, and Career Education Information. The role of instructional and supervisory vocational, occupational, and career education personnel in the total occupational information system. Kindergarten to adult.

576-6 (3, 3) Policy Implementation and Supervision of Vocational, Occupational, and Career Education Programs. 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 Vocational, Occupational, and Career Education in Diverse Settings. Similarities and dissimilarities of vocational, occupational, and career education 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 Vocational, Occupational, and Career Education Clientele. Familiarization with the characteristics and programming needs of clientele served by vocational, occupational, and career education programs.

582-3 Vocational, Occupational, and Career Education Planning and Policy Development. Survey of models and techniques for vocational, occupational, and career education planning and policy development at local, state, and national levels. Examination of research design and data collection procedures.

584-3 Articulated Vocational, Occupational, and Career Education Programs. Identifying, compiling, and organizing data necessary to the development and preparation of vocational, occupational, and career education related learning experiences.

586-3 Methods and Materials for Adult Vocational, Occupational, and Career Education Programs. Philosophy of adult education; current organizational patterns of adult programs; unit planning, methods, techniques, and resources.

590-1 to 4 Readings in Vocational, Occupational, and Career Education. Supervised readings in selected subjects (a) Agricultural education. (b) Business education. (c) Home economics education. (d) Occupational education. Prerequisite: consent of instructor.

591-1 to 9 New Developments in Vocational, Occupational, and Career Education Programs. Recent developments and trends in vocational, occupational, and career education presented by recognized authorities for discussion and review. (a) Agricultural education. (b) Business education. (c) Home economics education. (d) Occupational education.

592-2 to 6 Recent Research in Vocational, Occupational, and Career Education. Review of selected research in vocational, occupational, and career education, governmental, business, and industrial agencies. Emphasis on action research and use of research findings. (a) Agricultural education. (b) Business education. (c) Home economics education. (d) Occupational education. Offered alternate years.

593-2 to 4 Individualized Research in Vocational, Occupational, and Career Education. Selection and investigation of an appropriate problem or issue; use of relevant sources and techniques; collection, analysis, evaluation, and interpretation of data and the writing of a report of the investigation. (a) Agricultural education. (b) Business education. (c) Home economics education. (d) Occupational education. Prerequisite: consent of instructor.

594-1 to 4 Research Seminar in Vocational, Occupational and Career Education. Presentation of prospectus outlines, research projects, problems for research, progress reports of research by graduate students and faculty. (a) Agricultural education. (b) Business education. (c) Home economics education. (d) Occupational education. Prerequisite: consent of instructor.

595-1 to 16 Vocational, Occupational, and Career Education Professional Internship. Supervised professional experience in appropriate vocational or pre-vocational education settings. (a) Agricultural education. (b) Business education. (c) Home economics education. (d) Occupational education.

597-1 to 4 Vocational, Occupational, and Career Education Practicum in Supervision. Experience in using a variety of supervision techniques at various levels and areas both on campus and off. (a) Agricultural education. (b) Business education. (c) Home economics education. (d) Occupational education. Prerequisite: consent of instructor.

598-2 to 6 Special Investigations in Vocational, Occupational, and Career Education. 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. (a) Agricultural education. (b) Business education. (c) Home economics education. (d) Occupational education. Prerequisite: consent of instructor.

599-2 to 6 Thesis.

600-1 to 36 Dissertation.

Zoology

Students enrolled in zoology courses may incur field trip or laboratory expenses of \$5.00 to \$25.00.

402-3 Natural History of Invertebrates. Introduction to ecology, intraspecies communication and interspecies relationships of invertebrate animals. Recommended for teacher preparation programs. One lecture and two 2-hour laboratories per week. Cost of \$10 to \$20 may be incurred by student. Offered Fall term. Prerequisite: 120a or 220a.

403-3 Natural History of Vertebrates. Observation, identification, and life histories. Designed for teachers. Not for students specializing in vertebrate zoology. Cost of \$10 to \$20 may be incurred by student. One lecture and one 4-hour laboratory. Offered Spring term. Prerequisite: 120b or 220b.

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 \$5.00 may be incurred by student. Offered Fall term. Prerequisite: 120a or 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 term. Prerequisite: 120a or 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 \$5.00 may be incurred by student. Offered Fall term. Prerequisite: 120b or 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 \$5.00 may be incurred by student. Offered Spring term. Prerequisite: 10 semester hours of biological science including vertebrate biology.

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 laboratory per week. Cost of \$5.00 may be incurred by student. Offered (a) Fall; (b) Spring terms. Prerequisite: 120b or 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 term, (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 Fall term. Cost of \$19 to \$20 may be incurred by student for field trips. Prerequisite: 120a or 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. Fall term. Prerequisite: 120a or 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 term. Prerequisite: 10 semester hours of biological science.

426-3 Comparative Endocrinology. Comparison of mechanisms influencing hormone release, hormone biosynthesis, and the effects of hormones on target tissues. 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 term. Prerequisite: consent of instructor.

441-3 Emergence of Order in Biological Systems. From the molecular to any desired higher level of biological organization: systematic, cybernetic, evolutionary, and thermodynamic principles. Two lecture and one 2-hour laboratory per week. Cost of \$5.00 may be incurred by student. Offered Fall term. 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 term. Prerequisite: 120b or 220b.

462-2 Waterfowl. 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.

- 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 term. Prerequisite: 120b or 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 term. Prerequisite: 10 hours of biological science.
- 467-3 Ornithology.** Classification and recognition of birds and the study of their songs, nests, migratory habits, and other behavior. One lecture and two 2-hour laboratories per week. Cost of field trips may be up to \$20 per student. Offered Spring term. Prerequisite: 120b or 220b.
- 468-4 (2, 2) Wildlife Biology.** Basic concepts and techniques employed in managing wildlife populations and their associated ecosystems. A basic ecology course is desirable as background for this course. (a) Principles. Two 1-hour lectures per week. (b) Techniques. One 4-hour laboratory session per week, three or four of which will be field trips on Saturdays. Cost of field trips up to \$25 per student may be incurred. Offered Fall term. Prerequisite: 10 semester hours of biological science; plus for zoology majors, concurrent enrollment in 468b.
- 471-3 Entomology.** Structure, classification, and life histories of insects. One lecture and two 2-hour laboratories per week. Offered Fall term. Cost up to \$20 may be incurred by student for field trips. Prerequisite: 120a or 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 term. Prerequisite: 120a or 220a.
- 478-3 Animal Behavior.** Biological basis of the behavior of animals. Two lectures and one 2-hour laboratory per week. Prerequisite: one year or biological science or permission of instructor.
- 479-2 to 5 Concepts in Animal Behavior.** Terms and concepts relevant to the study of animal behavior. Guided self-instructional format, with two 1-hour and one 3-hour period scheduled weekly, primarily as question-answer and evaluation sessions. Offered Spring term. Prerequisite: one year of biological science or permission of instructor.
- 480-2 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. Cost of up to \$25 may be incurred by student. Offered Fall term. Prerequisite: at least two hours of *B* work in 478 or 479, or permission of instructor.
- 482-1 Zoology Seminar for Seniors.** Classical and contemporary topics in zoology. This requirement will normally be met by participating in the regular meeting of the seminar. In lieu of seminar attendance and with consent of departmental chairman, the student may elect to prepare and give an oral presentation at a special seminar on an agreed upon research topic. One meeting per week. Offered Fall, Spring, Summer terms. Not for graduate credit. Prerequisite: senior standing or 24 hours of life science completed. Mandatory Pass/Fail.
- 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 terms. 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 two-hour laboratories. Cost of \$5.00 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 two-hour meetings per week. Prerequisite: consent of instructor.
- 521-3 Advanced Limnology.** The physical, chemical, and biological factors affecting organisms in streams. Cost of \$10.00 may be incurred by student. Two lectures per week.
- 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.
- 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 one-hour laboratories per week. Prerequisite: consent of instructor.
- 561-3 Game Mammals.** Natural history and management. Two lectures and one two-hour

laboratory per week. Cost of \$5.00 may be incurred by student. Prerequisite: 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 four-hour laboratory alternate weeks. Cost of \$5.00 may be incurred by student. Prerequisite: consent of instructor.

567-1 to 4 Techniques in Fish Culture and Fish Management. Course organized as modules. One credit for completion of 2 modules. Register any semester, one year to complete elected number of modules. Written report and examination required for each module. Cost of \$100 may be incurred by the student. Prerequisite: 466, or 566, or their equivalent.

573-3 Physiological Ecology. The role of physiological, morphological, and behavioral adaptations and adjustments in the ecology of vertebrate organisms. Two hours of lecture and one two-hour laboratory. Cost of \$5.00 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 lectures 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.

585-27 (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. (g) Seminar in Parasitology. (h) Seminar on the Amphibia. (l) Seminar in Aquaculture. (m) Seminar in Fish Management. Three meetings per week. Prerequisite: consent of instructor.

593-1 to 8 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. Graded *S/U* only.

599-1 to 8 Research and Thesis. Thesis for master's degree. Some cost may be borne by student. Graded *S/U* only. Prerequisite: consent of instructor.

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.

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.

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 1976-1977.

Members of the Graduate Council for 1977-1978

HARRY AMMON, Professor, History
CLIFTON ANDERSEN, Professor, Marketing
W. C. ASHBY, Professor, Botany
JOHN BAKER, Associate Professor, Political Science
JAN BARTELSON, Student, English
JOHN BOE, Associate Professor, Music
KENNETH DANHOF, Associate Professor, Computer Science
THOMAS EYNON, Professor, Sociology
ROBERT GRIFFIN, Associate Professor, English
F. LEE GRISMORE, Associate Professor, Electrical Sciences & Systems Engineering
DOROTHY HIGGINBOTHAM, Professor, Speech Communication
DONNA HOLMES, Student, Rehabilitation
HELMUT LIEDLOFF, Professor, Foreign Languages & Literatures
JERRY LORENZ, Associate Professor, Rehabilitation
JOHN McGUIRE, Student, Higher Education
HARRY MILLER, Professor, Educational Leadership
CHRISTIAN MOE, Professor, Theater
HOWARD OLSON, Professor, Animal Industries
JOHN POHLMANN, Assistant Professor, Guidance and Educational Psychology
CARROLL RILEY, Professor, Anthropology
FRED SLOAN, Professor, Curriculum, Instruction and Media
HERBERT SNYDER, Professor, Mathematics
HOWARD STAINS, Professor, Zoology
RALPH SWICK, Professor, Accounting

Accountancy (College of Business and Administration)

BARRON, MARY NOEL, Associate Professor, C.P.A., M.B.A., University of Michigan, 1946; 1948.
BURGER, CLIFFORD R., Professor, C.P.A., M.S., Indiana State University, 1947; 1958.
ERIKSEN, DOUGLAS C., Associate Professor, C.P.A., C.M.A., Ph.D., University of Missouri, 1968; 1969.
GALLEGLY, ROBERT L., Associate Professor, *Emeritus*, A.M. University of Illinois, 1947; 1946.
GLICK, JOHN R., Assistant Professor, D.B.A., University of Colorado, 1975; 1974.

OGDEN, SUSIE, Associate Professor, *Emerita*, A.M. University of Illinois, 1931; 1931.
 SCHMIDLEIN, EDWARD J., JR., Professor, C.P.A., Ph.D., New York University, 1953; 1959.
 SWICK, RALPH D., Professor, C.P.A., D.B.A., Indiana University, 1954; 1955.
 TUCKER, MARVIN W., Associate Professor, Ph.D., University of Alabama, 1966; 1966.
 WHITE JACKSON, Professor and *Chairman*, Ph.D., Louisiana State Univ., 1964; 1977.
 WOELFEL, CHARLES J., Professor, C.P.A., Ph.D., University of Texas, 1957; 1969
 WRIGHT, ROLAND M., Professor, C.P.A., Ph.D., University of Iowa, 1962; 1966.

Administrative Sciences (College of Business and Administration)

BATEMAN, DAVID N., Associate Professor, Ph.D., Southern Illinois University, 1970; 1965.
 BEDWELL, R. RALPH, Associate Professor, *Emeritus*, Ph.D., Southern Illinois University, 1969; 1954.
 BUSSOM, ROBERT S., Assistant Professor and *Chairman*, Ph.D., Ohio State University, 1973; 1969.
 FOHR, JOHN M., Professor, Ed.D., Michigan State University, 1959; 1962.
 HUNT, JAMES G., Professor, Ph.D., University of Illinois, 1966; 1966.
 JAUCH, LAWRENCE, Associate Professor, Ph.D., University of Missouri, 1973; 1976
 LARSON, LARS L., Associate Professor, Ph.D., University of Illinois, 1971; 1971.
 OSBORN, RICHARD N., Associate Professor, D.B.A., Kent State University, 1971; 1971.
 REEVES, GARY, Assistant Professor, D.Sc., Washington University, 1973; 1976.
 REHN, HENRY J., Professor, *Emeritus*, Ph.D., University of Chicago, 1930; 1945.
 SCOTT, JOHN W., Professor, *Emeritus*, Ph.D., University of Chicago, 1930; 1947.
 VICARS, WILLIAM M., Associate Professor, Ph.D., Southern Illinois University, 1969; 1968.
 WESTBERG, WILLIAM C., Professor, Ph.D., Pennsylvania State University, 1948; 1952.
 WILSON, HAROLD K., Assistant Professor, D.B.A., University of Colorado, 1972; 1972.

Agricultural Industries (School of Agriculture)

BENTON, RALPH A., Professor, *Emeritus*, Ph.D., University of Illinois, 1955; 1956.
 DOERR, WILLIAM A., Assistant Professor, Ph.D., Southern Illinois University, 1973; 1965.
 HERR, WILLIAM MCD., Professor, Ph.D., Cornell University, 1954; 1957.
 KEEPPER, WENDELL E., Professor, *Emeritus*, Ph.D., Cornell University, 1938; 1950.
 LEGACY, JAMES, Assistant Professor, Ph.D., Cornell University, 1976; 1977.
 LYBECKER, DONALD W., Associate Professor, Ph.D., Iowa State University, 1970; 1970.
 PATERSON, JOHN J., Associate Professor, *Emeritus*, M.S., University of Saskatchewan, 1943; 1957.
 SOLVERSON, LYLE, Associate Professor, Ph.D., University of Wisconsin, 1967; 1966.
 STITT, THOMAS R., Professor, Ph.D., Ohio State University, 1967; 1967.
 WILLS, WALTER J., Professor, Ph.D., University of Illinois, 1952; 1956.
 WOLFF, ROBERT L., Associate Professor, Ph.D., Louisiana State University, 1971; 1972.
 WOOD, EUGENE S., Professor, and *Chairman*, Ed.D., University of Missouri, 1958; 1949.

Animal Industries (School of Agriculture)

GOODMAN, BILL L., Professor, Ph.D., Ohio State University, 1959; 1958.
 HAUSLER, CARL L., Associate Professor, Ph.D., Purdue University, 1970; 1970.
 HINNERS, SCOTT W., Professor, Ph.D., *Emeritus*, University of Illinois, 1958; 1951.
 HODSON, HAROLD H., JR., Professor, and *Chairman*, Ph.D., Iowa State University, 1965; 1971
 KAMMLADE, W. G., JR., Associate Professor, Ph.D., University of Illinois, 1951; 1954.
 KROENING, GILBERT H., Professor, Ph.D., Cornell University, 1965; 1969.
 LEE, D. DIXON, JR., Associate Professor, Ph.D., North Carolina State University, 1970; 1970.
 MALES, JAMES R., Assistant Professor, Ph.D., Ohio State University, 1973; 1974.
 OLSON, HOWARD H., Professor, Ph.D., University of Minnesota, 1952; 1954.
 REED, ALEX, Professor, *Emeritus*, Ph.D., University of Illinois, 1953; 1946.
 STRACK, LOUIS E., Associate Professor, D.V.M., University of Illinois, 1961; 1968.

Anthropology (College of Liberal Arts)

BENDER, M. LIONEL, Associate Professor, Ph.D., University of Texas at Austin, 1968; 1971.
 BRAUN, DAVID P., Assistant Professor, Ph.D., Southern Illinois University at Carbondale, 1977; 1977.
 BUTLER, BRIAN M., Archaeologist, Ph.D., University of Michigan, 1977; 1977.
 COOK, EDWIN A., Associate Professor, Ph.D., Yale University, 1967; 1971.
 DARK, PHILIP J. C., Professor, Ph.D., Yale University, 1954; 1960.
 EULER, ROBERT, Adjunct Professor, Ph.D., University of New Mexico 1958; 1976.
 FALK, DEAN, Assistant Professor, Ph.D., University of Michigan, 1976; 1977.

GUMERMAN, GEORGE J., Professor, and *Chairman*, Ph.D., University of Arizona, 1969; 1973.
 HANDLER, JEROME S., Professor, Ph.D., Brandeis University, 1965; 1962.
 KELLEY, J. CHARLES, Professor, *Emeritus*, Ph.D., Harvard University, 1948; 1950.
 MacLACHLAN, BRUCE B., Associate Professor, Ph.D., University of Chicago, 1962; 1964.
 MARING, ESTER G., Assistant Professor, Ph.D., Indiana University, 1969; 1965.
 MARING, JOEL M., Associate Professor, Ph.D., Indiana University, 1967; 1963.
 MULLER, JON D., Associate Professor, Ph.D., Harvard University, 1967; 1966.
 RANDE, ROBERT L., Professor, Ph.D., Columbia University, 1952; 1966.
 RILEY, CARROLL L., Professor, Ph.D., University of New Mexico, 1952; 1955.
 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.
 ADDINGTON, ALDON M., Assistant Professor M.F.A., Cranebrook Academy of Art, 1966; 1967.
 BARONE, VIOLET TROVILLION, Assistant Professor, *Emerita*, M.A., George Peabody College for Teachers, 1955; 1964.
 BERNSTEIN, LAWRENCE A., Associate Professor, M.F.A., Cranebrook Academy of Art, 1953; 1962.
 BOYSEN, BILL H., Associate Professor, M.F.A., University of Wisconsin, 1966; 1966.
 DELLER, HARRIS, Lecturer, M.F.A., Cranbrook Academy of Art, 1973; 1975.
 FEHM, SHERWOOD A. JR., Associate Professor, Ph.D., Yale University, 1971; 1977.
 FELDMAN, JOEL B., Assistant Professor, M.F.A., Indiana University, 1967; 1973.
 FINK, HERBERT L., Professor, M.F.A., Yale University, 1958; 1961.
 GREENFIELD, SYLVIA R., Assistant Professor, M.F.A., University of Colorado, 1967; 1968.
 JOHNSON, EVERT A., Lecturer, M.A., University of Iowa, 1954; 1966.
 KINGTON, L. BRENT, Professor, M.F.A., Cranebrook Academy of Art, 1961; 1961.
 LINTAULT, M. JOAN, Associate Professor, M.F.A., Southern Illinois University, 1962; 1973.
 LITTLEFIELD, F. LEE, Assistant Professor, M.A., University of New Mexico, 1968; 1968.
 MAVIGLIANO, GEORGE J., Assistant Professor, M.A., Northern Illinois University, 1967; 1970.
 ONKEN, MICHAEL O., Assistant Professor, M.A., Northern Illinois University, 1966; 1968.
 PAULSON, ROBERT L., Assistant Professor, M.F.A., University of Wisconsin, 1967; 1967.
 ROACH, LULA D., Associate Professor, *Emerita*, M.A., Washington University, 1953; 1930.
 SULLIVAN, JAMES E., Associate Professor, M.A., University of California at Los Angeles, 1965; 1969.
 SULLIVAN, MILTON F., Professor and *Director*, M.A., Columbia University, 1951; 1952.
 WOOD, DAN D., Assistant Professor, M.A., University of Iowa, 1968; 1968.

Botany (College of Science)

ASHBY, WILLIAM C., Professor, Ph.D., University of Chicago, 1950; 1960.
 MATTEN, LAWRENCE C., Professor, Ph.D., Cornell University, 1965; 1965.
 MOHLENBROCK, ROBERT H., Professor and *Chairman*, Ph.D., Washington University, 1957; 1957.
 OLAH, LADISLAO V., Professor, *Emeritus*, Ph.D., Stephen Tisza University, Hungary, 1934; 1959.
 PAPPELIS, ARISTOTEL J., Professor, Ph.D., Iowa State University, 1957; 1960.
 ROBERTSON, PHILIP A., Assistant Professor, Ph.D., Colorado State University, 1968; 1970.
 SCHMID, WALTER E., Professor, Ph.D., University of Wisconsin, 1961; 1962.
 STOTLER, BARBARA C., Associate Professor, Ph.D., University of Cincinnati, 1968; 1970.
 STOTLER, RAYMOND E., Associate Professor, Ph.D., University of Cincinnati, 1968; 1969.
 SUNDBERG, WALTER J., Associate Professor, Ph.D., University of California, 1971; 1972.
 TINDALL, DONALD R., Associate Professor, Ph.D., University of Louisville, 1966; 1966.
 UGENT, DONALD, Associate Professor, Ph.D., University of Wisconsin, 1966; 1968.
 VERDUIN, JACOB, Professor, Ph.D., Iowa State University, 1947; 1964.
 VOIGT, JOHN W., Professor, Ph.D., University of Nebraska, 1950; 1950.
 WELCH, WALTER B., Professor, *Emeritus*, Ph.D., University of Chicago, 1937; 1939.
 YOPP, JOHN H., Associate Professor, Ph.D., University of Louisville, 1969; 1970.

Center for the Study of Crime, Delinquency, and Corrections (College of Human Resources)

ANDERSON, DENNIS, Assistant Professor, Ed.D., University of Nebraska, 1970; 1970.
 BENNETT, LAWRENCE, Associate Professor and Director, Ph.D., Claremont Graduate School, 1968; 1976
 COUGHLIN, JOSEPH S., Professor, M.S.W., University of Wisconsin, 1954; 1973.

DREHER, ROBERT H., Associate Professor, J.D., University of Illinois, 1940; 1967.
 JOHNSON, ELMER H., Professor, Ph.D., University of Wisconsin, 1950; 1966.
 KLYMAN, FRED, Associate Professor, Ed.D., Oklahoma State University, 1973; 1976.
 MATTHEWS, CHARLES V., Associate Professor, M.A., University of Kansas City, 1951; 1962.
 RICH, VERNON, Associate Professor, Ph.D., Michigan State University, 1971; 1972.
 WILSON, KENNETH G., Assistant Professor, Ph.D., Kansas State University, 1973; 1973.
 WILSON, NANCI K., Assistant Professor, Ph.D., University of Tennessee, 1972; 1972.

Chemistry and Biochemistry (College of Science)

ARNOLD, RICHARD T., Professor, Ph.D., University of Illinois, 1937; 1969.
 BAILEY, JAMES, Assistant Professor, Ph.D., University of North Carolina, 1973; 1975.
 BEMILLER, JAMES N., Professor, Ph.D., Purdue University, 1959; 1961.
 BEYLER, ROGER E., Professor, Ph.D., University of Illinois, 1949; 1959.
 BOLEN D. WAYNE, Associate Professor, Ph.D., Florida State University, 1969; 1971.
 BROWN, GEORGE E., Professor, *Emeritus*, Ph.D., Iowa State University, 1941; 1962.
 CASKEY, ALBERT L., Associate Professor, Ph.D., Iowa State University, 1961; 1964.
 COX, JAMES A., Associate Professor, Ph.D., University of Illinois, 1967; 1969.
 DUNAWAY, GEORGE, Assistant Professor, Ph.D., University of Oklahoma, 1970; 1975.
 EMPTAGE, MICHAEL R., Assistant Professor, Ph.D., Harvard University, 1965; 1968.
 GUYON, JOHN C., Professor, Ph.D., Purdue University, 1961; 1974.
 HADLER, HERBERT I., Professor, Ph.D., University of Wisconsin, 1952; 1966.
 HADLEY, ELBERT H., Professor, Ph.D., Duke University, 1940; 1947.
 HALL, J. HERBERT, Professor, Ph.D., University of Michigan, 1959; 1962.
 HARGRAVE, PAUL A., Assistant Professor, Ph.D., University of Minnesota, 1970; 1973.
 HINCKLEY, CONRAD C., Professor, Ph.D., University of Texas, 1964; 1966.
 KOSTER, DAVID F., Associate Professor, Ph.D., Texas A & M University, 1965; 1967.
 MEYERS, CAL Y., Professor, Ph.D., University of Illinois, 1951; 1964.
 NECKERS, J. W., Professor, *Emeritus*, Ph.D., University of Illinois, 1927; 1927.
 SCHMIT, JOSEPH G., Assistant Professor, Ph.D., Purdue University, 1971; 1976.
 SCHMULBACH, C. DAVID, Professor and *Chairman*, Ph.D., University of Illinois, 1958; 1965.
 SLOCUM, DONALD W., Professor, Ph.D., New York University, 1963; 1965.
 SMITH, GERARD V., Professor, Ph.D., University of Arkansas, 1959; 1966.
 SUNG, MICHAEL T., Associate Professor, Ph.D., University of Wisconsin, 1968; 1971.
 TRIMBLE, RUSSELL F., Professor, Ph.D., Massachusetts Institute of Technology, 1951; 1954.
 TYRRELL, JAMES, Associate Professor, Ph.D., University of Glasgow, 1963; 1967.
 VAN LENTE, KENNETH A., Professor, *Emeritus*, Ph.D., University of Michigan, 1931; 1931.
 WOTIZ, JOHN H., Professor, Ph.D., Ohio State University, 1948; 1967.

Cinema and Photography (College of Communications and Fine Arts)

BLUMENBERG, RICHARD M., Associate Professor, Ph.D., Ohio University, 1969; 1970.
 BUKALSKI, PETER J., Associate Professor and *Chairman*, Ph.D., Ohio State University, 1975; 1975.
 COCKING, LOREN D., Assistant Professor, M.A., Ohio State University, 1969; 1976.
 COVELL, MICHAEL D., Assistant Professor, M.F.A., Ohio University, 1975; 1975.
 GILMORE, DAVID A., Associate Professor, M.F.A., Ohio University, 1969; 1969.
 HARPOLE, CHARLES H., Assistant Professor, Ph.D., New York University, 1976; 1977.
 HORRELL, C. WILLIAM, Professor, Ed.D., Indiana University, 1955; 1949.
 MERCER, JOHN, Professor, Ph.D., University of Nebraska, 1952; 1958.
 PAINE, FRANK, Associate Professor, B.S., Iowa State University, 1950; 1960.
 SWEDLUND, CHARLES A., Professor, M.S., Illinois Institute of Technology, 1961; 1971.

Comprehensive Planning and Design (College of Human Resources)

BERRY, THELMA HUFF, Professor, *Emerita*, Ed.D., Columbia University, 1963; 1966
 ELLNER, JACK R., Professor, Ph.D., New York University, 1969; 1971.
 FETTER, WILLIAM A., Research Associate, B.F.A., University of Illinois, 1952; 1970.
 FRIEND, SHIRLEY E., Associate Professor, Ed.D., University of Arkansas, 1969; 1972.
 GROSKOWSKY, HAROLD, Lecturer, Certificate, IIT, Institute of Design, Chicago, 1953; 1960.
 KULA, ELSA, Lecturer, B.F.A., Pratt Institute, Brooklyn, New York IIT, Institute of Design, Chicago, 1942; 1957.
 LOUGEAY, PAUL J., Associate Professor, Registered Architect, M.S., Southern Illinois University, 1973; 1952.
 PADGETT, ROSE, Professor, *Emerita*, Ph.D., Purdue University, 1955; 1962.
 PERK, HARRY F. W., Lecturer, A.B., University of California at Los Angeles, 1951; 1964.

PRATT, DAVID J., Lecturer, Certificate, University of Chicago and ITT, Institute of Design, Chicago, 1939; 1957.
 ROAN, HERBERT, Lecturer and Instructor, Certificate, Cooper Union, 1938; 1957.
 SCHOEN, ALAN HUGH, Professor, Ph.D., University of Illinois, 1958; 1973.
 ST. JOHN, WAYNE L., Associate Professor and *Director*, Ph.D., University of Oregon, 1954; 1975.
 WHITESEL, RITTA, Associate Professor, Emerita, M.A., Columbia University, 1941; 1955.

Computer Science (College of Liberal Arts)

BATEMAN, BARRY L., Adjunct Professor, Ph.D., Texas A & M University, 1970; 1976.
 DANHOF, KENNETH J., Associate Professor and *Chairman*, Ph.D., Purdue University, 1969; 1969.
 GUHA, RATAN K., Associate Professor, Ph.D., University of Texas at Austin, 1970; 1970.
 MARK, ABRAHAM M., Professor, Ph.D., Cornell University, 1947; 1950.
 WRIGHT, WILLIAM E., Assistant Professor, D.Sc., Washington University, 1972; 1970.

Curriculum, Instruction, and Media (College of Education)

AIKMAN, ARTHUR L., Professor, Ph.D., Southern Illinois University, 1965; 1964.
 ALSTON, MELVIN O., Professor, *Emeritus*, Ed.D., Columbia University, 1945; 1970.
 BAUNER, RUTH E., Associate Professor, M.S., University of Illinois, 1956; 1956.
 BEDIANT, DOUGLAS, Assistant Professor, Ph.D., Southern Illinois University, 1971; 2969.
 BOYKIN, ARSENE O., Associate Professor, Ed.D., University of Illinois, 1964; 1972.
 BRADFIELD, LUTHER E., Professor, Ed.D., Indiana University, 1953; 1955.
 BROD, ERNEST E., Professor, *Emeritus*, Ed.D., University of Northern Colorado, 1953; 1951.
 BUTTS, GORDON K., Professor, Ed.D., Indiana University, 1956; 1950.
 CASEY, JOHN P., Professor, Ed.D., Indiana University, 1963; 1964.
 COX, DOROTHY, Assistant Professor, Ph.D., Southern Illinois University, 1976; 1965.
 DALE, DORIS C., Associate Professor, D.L.S., Columbia University, 1968; 1969.
 DIXON, BILLY G., Associate Professor, Ph.D., Southern Illinois University, 1967; 1961.
 FLETCHER, KATHLEEN G., Associate Professor, *Emerita*, M.S., University of Illinois, 1947; 1955.
 FILGOR, ROSS J., Professor, *Emeritus*, Ph.D., Michigan State University, 1953; 1940.
 HILL, MARGARET K., Professor, Ed.D., Boston University, 1948; 1965.
 HUNGERFORD, HAROLD R., Professor, Ph.D., Southern Illinois University, 1970; 1965.
 JACKSON, MICHAEL, Associate Professor, Ed.D., University of Florida, 1971; 1971.
 KLASEK, CHARLES B., Associate Professor, Ph.D., University of Nebraska, 1971; 1971.
 LAMB, MORRIS L., Associate Professor, Ed.D., University of Oklahoma, 1970; 1970.
 LEE, J. MURRAY, Professor, *Emeritus*, Ph.D., Columbia University, 1934; 1958.
 LINDBERG, DORMALEE H., Associate Professor, Ed.D., University of Missouri, Columbia, 1969; 1969.
 LONG, RUTH A., Associate Professor, Ed.D., Indiana University, 1972; 1970.
 MALONE, WILLIS E., Professor, *Emeritus*, Ph.D., Ohio State University, 1950; 1939.
 MATTHIAS, MARGARET, Assistant Professor, Ph.D., Southern Illinois University, 1972; 1969.
 MEES, JOHN D., Professor, *Emeritus*, Ed.D., Indiana University, 1950; 1946.
 MORPURGO, JANE S., Assistant Professor, Ph.D., University of Illinois, 1975; 1974.
 PAIGE, DONALD D., Professor and *Chairman*, Ed.D., Indiana University, 1966; 1966.
 QUISENBERRY, JAMES D., Assistant Professor, Ph.D., Indiana University, 1972; 1971.
 QUISENBERRY, NANCY L., Associate Professor, Ed.D., Indiana University, 1971; 1971.
 RANDOLPH, VICTOR, Professor, *Emeritus*, Ph.D., George Peabody College for Teachers, 1942; 1933.
 SAMFORD, CLARENCE, Professor, *Emeritus*, Ph.D., New York University, 1940; 1951.
 SEIFERTH, BERNIECE B., Associate Professor, Ed.D., University of Missouri, 1955; 1955.
 SHEPHERD, TERRY R., Associate Professor, Ph.D., University of Illinois, 1971; 1971.
 SLOAN, FRED A., Professor, Ed.D., George Peabody College for Teachers, 1959; 1968.
 SPIGLE, IRVING S., Associate Professor, Ed.D., Indiana University, 1955; 1970.
 STEHR, JEAN, Associate Professor, M.A., Texas Women's University, 1945; 1944.
 STEINRUCK, YVONNE, Assistant Professor, Ph.D., University of Toledo, 1975; 1975.
 STEPHENS, CLARENCE, Professor, *Emeritus*, Ed.D., Indiana University, 1955; 1952.
 TOMERA, AUDREY, Associate Professor, Ph.D., Southern Illinois University, 1973; 1969.
 WENDT, PAUL R., Professor, *Emeritus*, Ph.D., University of Minnesota, 1948; 1955.
 WINSOR, DONALD, Associate Professor, Ed.D., University of Florida, 1961; 1965.

Economics (College of Liberal Arts)

ADAMS, DONALD R., JR., Associate Professor, Ph.D., University of Pennsylvania, 1967; 1968.

BOHI, DOUGLAS R., Professor, Ph.D., Washington State University, 1967; 1970.
 EDELMAN, MILTON T., Professor, Ph.D., University of Illinois, 1951; 1950.
 ELLIS, ROBERT J., JR., Associate Professor, Ph.D., University of Virginia, 1966; 1962.
 FORAN, TERRY G., Associate Professor and *Chairman*, Ph.D., Pennsylvania State University, 1970; 1969.
 FRYMAN, RICHARD F., Associate Professor, Ph.D., University of Illinois, 1967; 1966.
 HAND, GEORGE H., Professor, *Emeritus*, Ph.D., Princeton University, 1939; 1952.
 HICKMAN, C. ADDISON, Professor, Vandevver Chair of Economics, Ph.D., University of Iowa, 1942; 1960.
 LAYER, ROBERT G., Professor, Ph.D., Harvard University, 1952; 1955.
 MORRISON, VERNON G., Professor, *Emeritus*, Ph.D., University of Nebraska, 1961; 1947.
 MYERS, JOHN G., Assistant Professor, Ph.D., Columbia University, 1961; 1977.
 SHIELDS, MICHAEL P., Assistant Professor, Ph.D., University of Utah, 1975; 1975.
 STALON, CHARLES G., Associate Professor, Ph.D., Purdue University, 1966; 1963.
 VOGEL, ROBERT C., Associate Professor, Ph.D., Stanford University, 1967; 1972.
 WIEGAND, G. C., Professor, *Emeritus*, Ph.D., Northwestern University, 1950; 1956.

Educational Leadership (College of Education)

ARMISTEAD, FRED, J., Professor, *Emeritus*, Ph.D., University of California, 1960; 1961.
 BACH, JACOB O., Professor, Ph.D., University of Wisconsin, 1951; 1951.
 BRACEWELL, GEORGE, Professor, *Emeritus*, Ed.D., Washington University, 1952; 1931.
 BRAMMELL, PARIS R., Professor, *Emeritus*, Ph.D., University of Washington, 1930; 1960.
 BRYANT, ROYE R., Professor, *Emeritus*, Ed.D., Washington University, 1952; 1948.
 BUSER, ROBERT L., Professor, Ed.D., Indiana University, 1966; 1967.
 CHILDS, JOHN L., Professor, *Emeritus*, Ph.D., Teachers College, Columbia University, 1931; 1961.
 CLARK, ELMER J., Professor, Ph.D., University of Michigan, 1949; 1964.
 DENNIS, LAWRENCE J., Professor, Ph.D., Southern Illinois University, 1968; 1968.
 DUFF, GRACE, Assistant Professor, Ph.D., Southern Illinois University, 1970; 1973.
 EATON, WILLIAM E., Associate Professor, Ph.D., Washington University, 1971; 1971.
 EWING, PARMER L., Professor, *Emeritus*, Ed.D., New York University, 1950; 1965.
 FISHBACK, WOODSON W., Associate Professor, *Emeritus*, Ph.D., University of Chicago, 1947; 1948.
 HALL, JAMES H., Associate Professor, *Emeritus*, Ed.D., George Washington University, 1950; 1952.
 JACOBS, ROBERT, Professor, *Emeritus*, Ed.D., Wayne State University, 1949; 1962.
 KAISER, DALE E., Professor, Ph.D., University of Illinois, 1963; 1966.
 LAWLER, EUGENE S., Professor, *Emeritus*, Ph.D., Columbia University, 1932; 1961.
 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, Ed.D., University of Denver, 1952; 1964.
 MERWIN, BRUCE W., Professor, *Emeritus*, Ph.D., University of Kansas, 1929; 1927.
 MILLER, HARRY G., Professor, and *Chairman*, Ed.D., University of Nebraska, 1970; 1970.
 MOORE, MALVIN E., Professor, Ed.D., George Peabody College for Teachers, 1959; 1968.
 NEAL, CHARLES D., Professor, *Emeritus*, Ed.D., Indiana University, 1948; 1948.
 PARKER, JAMES C., Associate Professor, Ed.D., University of Tennessee, 1971; 1971.
 RIPPLE, KENNETH E., Associate Professor, Ed.D., Michigan State University, 1968; 1974.
 SASSE, EDWARD B., Professor, Ph.D., University of Wisconsin, 1966; 1966.
 SHELTON, WILLIAM E., Associate Professor, Ph.D., University of Chicago, 1950; 1951.
 STUCK, DEAN, Professor, Ph.D., Iowa State University, 1968; 1968.
 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, Ph.D., Southern Illinois University, 1964; 1958.

Electric Sciences and Systems Engineering (School of Engineering and Technology)

DODD, CURTIS W., Associate Professor, Ph.D., Arizona State University, 1967; 1967.
 DUNNING, E. LEON, Professor, Ph.D., University of Houston, 1967; 1957.
 FIESTE, VERNOLD K., Associate Professor, Ph.D., University of Missouri at Columbia, 1966; 1966.
 GRISMORE, F. LEE, JR., Associate Professor, Ph.D., Georgia Institute of Technology, 1970; 1969.
 LIT, ALFRED, Professor, Ph.D., Columbia University, 1948; 1961.
 McCALLA, THOMAS, JR., Associate Professor, Ph.D., Case Western Reserve University, 1969; 1969.
 RAWLINGS, CHARLES A., Assistant Professor, Ph.D., Southern Illinois University, 1974; 1964.

SMITH, JAMES G., Professor and *Chairman*, Ph.D., University of Missouri at Rolla, 1967; 1966.

Engineering Mechanics and Materials (School of Engineering and Technology)

AL-RUBAYI, NAJIM, Professor, Ph.D., University of Wisconsin, 1966; 1966.
 BROWER, WILLIAM E., JR., Assistant Professor, Ph.D., Massachusetts Institute of Technology, 1969; 1976.
 CHUGH, YOGINDER, Associate Professor, Ph.D., Pennsylvania State University, 1971; 1977.
 DAVIS, PHILIP, Professor and *Chairman*, Ph.D., University of Michigan, 1963; 1964.
 EVERS, JAMES, Associate Professor, Ph.D., University of Alabama, 1969; 1969.
 NOWACKI, C. RAYMOND, Associate Professor, Ph.D., University of Illinois, 1965; 1963.
 ORTHWEIN, WILLIAM, Professor, Ph.D., University of Michigan, 1959; 1965.
 SAMI, SEDAT, Professor, Ph.D., University of Iowa, 1966; 1966.

English (College of Liberal Arts)

APPLEBY, BRUCE C., Associate Professor, Ph.D., University of Iowa, 1967; 1967.
 BARBOUR, FRANCES, Associate Professor, *Emerita*, M.A., Washington University, 1920; 1925.
 BENZIGER, JAMES G., Professor, Ph.D., Princeton University, 1941; 1950.
 BOYLE, TED EUGENE, Professor, Ph.D., University of Nebraska, 1962; 1963.
 BROWN, WILLIAM J., Associate Professor, Ph.D., Duke University, 1966; 1966.
 COHN, ALAN MARTIN, Professor, M.S., University of Illinois, 1955; 1955.
 COLEMAN, E. C., Professor, *Emeritus*, Ph.D., University of Illinois, 1936; 1946.
 DONOW, HERBERT, Associate Professor, Ph.D., University of Iowa, 1966; 1966.
 FRIEND, JEWELL, Associate Professor, Ph.D., Southern Illinois University, 1970; 1967.
 GOODIN, GEORGE, Associate Professor, Ph.D., University of Illinois, 1962; 1966.
 GRIFFIN, ROBERT P., Associate Professor, Ph.D., University of Connecticut, 1965; 1965.
 HARPER, CLIFFORD D., Associate Professor, Ph.D., St. Louis University, 1972; 1973.
 HATTON, THOMAS J., Associate Professor, Ph.D., University of Nebraska, 1966; 1965.
 HILLEGAS, MARK, Professor, Ph.D., Columbia University, 1957; 1965.
 HOWELL, JOHN M., Associate Professor, Ph.D., Tulane University, 1963; 1963.
 HURLEY, PAUL, Professor, Ph.D., Duke University, 1962; 1965.
 KRAPPE, EDITH, Associate Professor, *Emerita*, Ph.D., University of Pennsylvania, 1953; 1929.
 LAWSON, RICHARD A., Associate Professor, Ph.D., Tulane University, 1966; 1963.
 LITTLE, JUDY RUTH, Associate Professor, Ph.D., University of Nebraska, 1969; 1969.
 MOORE, HARRY T., Professor and Research Professor, *Emeritus*, Ph.D., Boston University 1951; 1963.
 MOSS, SIDNEY P., Professor, Ph.D., University of Illinois, 1954; 1964.
 PARTLOW, ROBERT B., JR., Professor, and *Chairman*, Ph.D., Harvard University, 1955; 1957.
 PETERSON, RICHARD F., Associate Professor, Ph.D., Kent State University, 1969; 1969.
 PIPER, HENRY DAN, Professor, Ph.D., University of Pennsylvania, 1950; 1962.
 RAINBOW, RAYMOND, Associate Professor, Ph.D., University of Chicago, 1959; 1949.
 RAZIS, M. BYRON, Professor, Ph.D., New York University, 1966; 1966.
 RUDNICK, HANS, Associate Professor, Ph.D., University of Freiburg, Germany, 1966; 1966.
 SCHONHORN, MANUEL, Professor, Ph.D., University of Pennsylvania, 1963; 1968.
 SCHULTZ, JOHN HOWARD, Professor, *Emeritus*, Ph.D., Harvard University, 1940; 1967.
 SIMEONE, WILLIAM E., Professor, Ph.D., University of Pennsylvania, 1950; 1950.
 STIBITZ, E. EARLE, Professor, Ph.D., University of Michigan, 1951; 1952.
 TAYLOR, LARRY E., Associate Professor, Ph.D., University of Oklahoma, 1969; 1968.
 TENNEY, CHARLES D., University Professor, *Emeritus*, Ph.D., University of Oregon, 1931; 1931.
 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)

ELSAID, HUSSEIN H., Associate Professor, Ph.D., University of Illinois, 1964; 1967.
 MATHER, IQBAL, Associate Professor, Ph.D., University of Cincinnati, 1974; 1977.
 SPRECHER, C. RONALD, Associate Professor, Ph.D., University of Illinois, 1969; 1970.
 TYLER, R. STANLEY, Associate Professor, J.D., University of Illinois, 1952; 1970.
 VAUGHN, DONALD E., Professor, and *Chairman*, Ph.D., University of Texas, 1961; 1970.
 WATERS, GOLA E., Associate Professor, J.D., University of Iowa, 1957; Ph.D., Southern Illinois University, 1970; 1965.

Foreign Languages and Literature (College of Liberal Arts)

- BORK, ALBERT W., Professor, *Emeritus*, Doctor en Letras, National University of Mexico, 1944; 1958.
- CANFIELD, D. LINCOLN, Visiting Professor, *Emeritus*, Ph.D., Columbia University, 1934; 1970.
- DAVIS, J. CARY, Professor, *Emeritus*, Ph.D., University of Chicago, 1936; 1930.
- FRENCH, HOWARD, Associate Professor, *Emeritus*, Ph.D., Indiana University, 1952; 1962.
- GOBERT, DAVID L., Professor, Ph.D., University of Iowa, 1960; 1965.
- HARTMAN, STEVEN LEE, Assistant Professor, Ph.D., University of Wisconsin, 1971; 1971.
- HARTWIG, HELLMUT A., Professor, *Emeritus*, Ph.D., University of Illinois, 1943; 1948.
- KILKER, JAMES, Associate Professor, Ph.D., University of Missouri at Columbia, 1961; 1967.
- KUPCEK, JOSEPH, Professor, Ph.D., Comenius University, Bratislava, Czechoslovakia, 1943; 1962.
- LIEDLOFF, HELMUT, Professor, 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 at Berkeley, 1965; 1969.
- O'BRIEN, JOAN, Associate Professor, Ph.D., Fordham University, 1961; 1969.
- O'MEARA, MAURICE, Associate Professor, Ph.D., University of Iowa, 1967; 1969.
- ORECHWA, OLGA, Assistant Professor, Ph.D., Ukrainian Free University, Germany, 1970; 1967.
- PEACOCK, VERA L., Professor, *Emerita*, Ph.D., Cornell University, 1930; 1930.
- SMITH, MADELEINE M., Associate Professor, *Emerita*, Ph.D., Yale University, 1952; 1929.
- 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 and *Chairman*, Ph.D., University of Southern California, 1960; 1972.
- WOODBIDGE, HENSLEY, Professor, Ph.D., University of Illinois, 1950; 1965.

Forestry (School of Agriculture)

- AUBERTIN, GERLAD, Associate Professor, Ph.D., Pennsylvania State University, 1964; 1976.
- BUDELSKY, CARL A., Assistant Professor, Ph.D., University of Arizona 1969; 1967.
- BURDE, JOHN H., Assistant Professor, Ph.D., University of Arizona, 1974; 1974.
- CHILMAN, KENNETH C., Associate Professor, Ph.D., University of Michigan, 1972; 1973.
- FRALISH, JAMES S., Associate Professor, Ph.D., University of Wisconsin, 1970; 1969.
- GAFFNEY, GERALD R., Assistant Professor, Ph.D., Southern Illinois University, 1970; 1969.
- KUNG, FAN H., Associate 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., Associate Professor, Ph.D., Kansas State University, 1968; 1967.
- SPALT, HOWARD A., Associate Professor and *Chairman*, D For., Yale University, 1959; 1975.
- WEAVER, GEORGE T., Associate Professor, 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., Associate Professor, Ph.D., Clark University, 1968; 1967.
- BEAZLEY, RONALD I., Professor, Ph.D., Purdue University, 1954; 1959.
- CHRISTENSEN, DAVID E., Professor, Ph.D., University of Chicago, 1956; 1961.
- CUNNINGHAM, FLOYD, Professor, *Emeritus*, Ph.D., Clark University, 1930; 1947.
- DWORKIN, DANIEL M., Assistant Professor, Ph.D., Clark University, 1974; 1976.
- HORSLEY, A. DOYNE, Assistant Professor, Ph.D., Southern Illinois University, 1974; 1968.
- HORTON, FRANK E., Professor, Ph.D., Northwestern University, 1966; 1975.
- 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, 1952; 1930.
- LIEBER, STANLEY R., Assistant Professor, Ph.D., University of Iowa, 1974; 1975.
- SHARPE, DAVID M., Associate Professor and *Chairman*, Ph.D., Southern Illinois University, 1968; 1966.

Geology (College of Science)

- COLE, REX D., Assistant Professor, Ph.D., University of Utah, 1975; 1975.

DUTCHER, RUSSELL R., Professor, and *Chairman*, Ph.D., The Pennsylvania State University, 1960; 1970.
 FANG, JEN-HO, Professor, Ph.D., Pennsylvania State University, 1961; 1964.
 FRAUNFELTER, GEORGE H., Professor, Ph.D., University of Missouri, Columbia, 1964; 1965.
 HARRIS, STANLEY, E., JR., Professor, Ph.D., University of Iowa, 1947; 1949.
 HOOD, WILLIAM C., Professor, Ph.D., University of Montana, 1964; 1968.
 MANSFIELD, CHARLES, Assistant Professor, Ph.D., Stanford University, 1972; 1975.
 RITTER, DALE F., Professor, Ph.D., Princeton University, 1964; 1972.
 ROBINSON, PAUL D., Assistant Professor, M.S., Southern Illinois University, 1963; 1967.
 SEXTON, JOHN L., Assistant Professor, Ph.D., Indiana University, 1974; 1975.
 UTGAARD, JOHN E., Professor, Ph.D., Indiana University, 1963; 1965.
 ZIMMERMAN, JAY, JR., Associate Professor, Ph.D., Princeton University, 1968; 1973.

Guidance and Educational Psychology (College of Education)

ALTEKRUSE, MICHAEL D., Professor, Ed.D., Indiana University, 1967; 1967.
 AMBLE, BRUCE ROY, Professor, Ph.D., University of Iowa, 1963; 1965.
 BARDO, HAROLD R., Associate Professor, Ph.D., Southern Illinois University, 1972; 1968.
 BEGGS, DONALD L., Professor, Ph.D., University of Iowa, 1966; 1966.
 BRADLEY, RICHARD W., Professor, Ph.D., University of Wisconsin, 1968; 1968.
 CODY, JOHN J., Professor, Ph.D., University of Wisconsin, 1961; 1965.
 DEICHMANN, JOHN W., Associate Professor, Ph.D., St. Louis University, 1969, 1969.
 DENZEL, HARRY, Adjunct Assistant Professor, Ph.D., Southern Illinois University, 1971; 1964.
 DeWEESE, HAROLD L., Professor, Ed.D., University of Illinois, 1959; 1959.
 ELMORE, PATRICIA B., Associate Professor, Ph.D., Southern Illinois University, 1970; 1967.
 EVANS, JOHN REAVES, Associate Professor, Ph.D., Southern Illinois University, 1968; 1970.
 GRENFELL, JOHN E., Professor, Ed.D., Oregon State University, 1966; 1966.
 IDEUS, HARVEY S., Associate Professor, Ed.D., University of Wyoming, 1965, 1973.
 KELLY, FRANCIS J., Professor, Ph.D., University of Texas, 1963; 1965.
 LEITNER, DENNIS, Assistant Professor, Ph.D., University of Maryland, 1975; 1974.
 LEWIS ERNEST, Associate Professor and *Chairman*, Ph.D., Southern Illinois University, 1971; 1970.
 LINDSEY, JEFFERSON F., Professor, Ed.D., University of Texas, 1962; 1967.
 MEEK, CLINTON ROSCOE, Professor, Ph.D., George Peabody College for Teachers, 1954; 1957.
 MILLER, WILLIAM G., Associate Professor, Ph.D., University of Iowa, 1967; 1971.
 MOUW, JOHN T., Associate Professor, Ed.D., University of South Dakota, 1968; 1968.
 PHELPS, WILLIAM, Professor, *Emeritus*, Ed.D., University of Northern Colorado, 1943; 1949.
 POHLMANN, JOHN T., Associate Professor, Ph.D., Southern Illinois University, 1972; 1971.
 RENZABLIA, GUY A., Professor, Ph.D., University of Minnesota, 1952; 1955.
 SNOWMAN, JACK, Assistant Professor, Ph.D., Indiana University, 1975; 1974.
 VIECELLI, LOUIS, Assistant Professor, M.S.Ed., Southern Illinois University, 1959; 1958.
 WHITE, GORDON, Assistant Professor, Ph.D., University of Iowa, 1969; 1971.
 WICKERSHAM, BEVERLY, Assistant Professor, Ph.D., University of Iowa, 1974; 1974.
 WOHLKE, PAULA L., Assistant Professor, Ph.D., Arizona State University, 1973; 1973.
 YATES, J. W., Professor, Ed.D., University of Missouri, Columbia, 1951; 1964.

Health Education (College of Education)

AARON, JAMES E., Professor, Ed.D., New York University, 1960; 1957.
 AMADIO, JOHN B., Assistant Professor, Ph.D., University of Oklahoma, 1970; 1970.
 BOYDSTON, DONALD N., Professor and *Chairman*, Ed.D., Columbia University, 1949; 1955.
 BRIDGES, A. FRANK, Professor, *Emeritus*, D.H.S., Indiana University, 1952; 1947.
 CASEY, RALPH, Associate Professor, Ed.D., Columbia University, 1956; 1957.
 DENNY, FLORENCE E., Associate Professor, *Emerita*, M.A., Columbia University, 1935; 1929.
 GRISSON, DEWARD K., Professor, *Emeritus*, Ed.D., Columbia University, 1952; 1956.
 HARRIS, EILEEN M., Assistant Professor, Ph.D., Southern Illinois University, 1970; 1967.
 LEFEVRE, JOHN R., Professor, Ed.D., Teachers College, Columbia University, 1950; 1955.
 LINDAUER, LARRY, Assistant Professor, Ph.D., Southern Illinois University, 1972; 1972.
 MOGLIA, RONALD, Assistant Professor, D.Ed., Temple University, 1976; 1975.
 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.
 RITZEL, DALE, Associate Professor, Ph.D., Southern Illinois University, 1970; 1966.

RUSSELL, ROBERT D., Professor, Ed.D., Stanford University, 1954; 1965.
 SLIEPCEVICH, ELENA M., Professor, D.P.E., Springfield College, 1955; 1973.
 VAUGHN, ANDREW T., Professor, D.Ed., Columbia University, 1958; 1958.

Higher Education (College of Education)

ADAMS, FRANK C., Professor, *Emeritus*, Ph.D., Southern Illinois University, 1962; 1957.
 CALDWELL, OLIVER J., Professor, *Emeritus*, M.S. Oberlin College, 1927; 1966.
 CASEBEER, ARTHUR L., Associate Professor, Ed.D., Oregon State University, 1963; 1969.
 DAVIS, I. CLARK, Professor, *Emeritus*, Ed.D., Indiana University, 1956; 1949.
 DINGERSON, MICHAEL R., Assistant Professor, Ph.D., Southern Illinois University, 1974; 1968.
 GRAHAM, JACK W., Professor, Ph.D., Purdue University, 1951; 1951.
 GRINNELL, JOHN E., Professor, *Emeritus*, Ph.D., Stanford University, 1934; 1955.
 HAWLEY, JOHN B., Professor, Ph.D., University of Michigan, 1957; 1965.
 JUNG, LOREN B., Professor, Ph.D., Southern Illinois University, 1969; 1965.
 KEENE, ROLAND, Professor, Ed.D., Washington University, 1962; 1958.
 KING, JOHN E., Professor and *Chairman*, Ph.D., Cornell University, 1941; 1967.
 MORRILL, PAUL H., Professor, Ph.D., Northwestern University, 1956; 1964.
 PRATT, ARDEN L., Professor, Ph.D., State University of New York at Buffalo, 1968; 1971.
 SPEES, EMIL R., Assistant Professor, Ph.D., Claremont Graduate School, 1969; 1969.
 SWINBURNE, BRUCE R., Associate Professor, Ed.D., Indiana University, 1970; 1970.
 TOLLE DONALD J., Professor, Ed.D., Florida State University, 1957; 1967.
 ZIMMERMAN, ELWYN, Assistant Professor, Ph.D., Michigan State University, 1963; 1966.

History (College of Liberal Arts)

ADAMS, GEORGE W., Professor, *Emeritus*, Ph.D., Harvard University, 1946; 1958.
 ALLEN, HOWARD W., Professor, Ph.D., University of Washington, 1959; 1962.
 AMMON, HARRY, Professor, and *Chairman*, Ph.D., University of Virginia, 1948; 1950.
 BARTON, H. ARNOLD, Professor, Ph.D., Princeton University, 1962; 1970.
 BATINSKI, MICHAEL C., Assistant Professor, Ph.D., Northwestern University, 1969; 1968.
 BREHM, DONALD L., Assistant Professor, Ph.D., St. Louis University, 1968; 1967.
 CARROTT, M. BROWNING, Associate Professor, Ph.D., Northwestern University, 1966; 1967.
 CHERRY, GEORGE L., Professor, *Emeritus*, Ph.D., Northwestern University, 1938; 1947.
 CLIFFORD, JOHN R., Associate Professor, Ph.D., University of Iowa, 1954; 1955.
 CONRAD, DAVID E., Associate Professor, Ph.D., University of Oklahoma, 1962; 1967.
 DETWILER, DONALD S., Professor, Dr. Phil., Göttingen University, Germany, 1961; 1967.
 DOTSON, JOHN E., Assistant Professor, Ph.D., Johns Hopkins University, 1969; 1970.
 FLADELAND, BETTY L., Professor, Ph.D., University of Michigan, 1952; 1962.
 GARDINER, C. HARVEY, Professor, *Emeritus*, Ph.D., University of Michigan, 1945; 1957.
 GOLD, ROBERT L., Professor, Ph.D., University of Iowa, 1964; 1965.
 KUO, PING-CHIA, Professor, *Emeritus*, Ph.D., Harvard University, 1933; 1959.
 McFARLIN, HAROLD A., Assistant Professor, Ph.D., Indiana University, 1971; 1969.
 MURPHY, JAMES B., Associate Professor, Ph.D., Louisiana State University, 1968; 1968.
 O'DAY, EDWARD J., Instructor, A.M., Indiana University, 1956; 1962.
 PITKIN, WILLIAM A., Associate Professor, *Emeritus*, Ph.D., University of Texas, 1940; 1945.
 SHELBY, LON R., Professor, Ph.D., University of North Carolina, 1962; 1961.
 SIMON, JOHN Y., Professor, Ph.D., Harvard University, 1961; 1964.
 VYVERBERG, HENRY S., Associate Professor, Ph.D., Harvard University, 1950; 1968.
 WERLICH, DAVID P., Assistant Professor, Ph.D., University of Minnesota, 1968; 1968.
 WRIGHT, JOHN I., Associate Professor, *Emeritus*, A.M., University of Chicago, 1933; 1925.
 WU, TIEN-WEI, Associate Professor, Ph.D., University of Maryland, 1965; 1972.
 ZUCKER, STANLEY, Associate Professor, Ph.D., University of Wisconsin, 1968; 1967.

Human Development (College of Human Resources)

BARNES, MARY LOUISE, Assistant Professor, *Emerita*, M.S., Iowa State College, 1931; 1929.
 BENARD, BARBARA HOSKIN, Assistant Professor, Ph.D., Southern Illinois University, 1972; 1970.
 BROOKS, THOMAS M., Professor, Ph.D., Pennsylvania State University, 1961; 1971.
 CRAIG, KAREN E., Associate Professor, Ph.D., Purdue University, 1969; 1967.
 EDDLEMAN, E. JACQUELINE, Assistant Professor, Ph.D., Southern Illinois University, 1970; 1969.
 ENDRES, JEANNETTE M., Assistant Professor, Ph.D., St. Louis University, 1972; 1975.
 HARPER, JEANNIE M., Professor, *Emerita*, Ph.D., Cornell University, 1941; 1958.
 KONISHI, FRANK, Professor, Ph.D., Cornell University, 1958; 1961.
 PAYNE, IRENE R., Professor, Ph.D., Cornell University, 1960; 1965.

QUIGLEY, EILEEN, Professor, *Emerita*, Ed.D., University of Missouri, 1947; 1948.
 SPEES, EDITH C., Assistant Professor, Ph.D., Claremont Graduate School, 1968; 1969.
 ZUNICH, MICHAEL, Professor and *Director*, Ph.D., Florida State University, 1959; 1965.

Journalism (College of Communications and Fine Arts)

ATWOOD, L. ERWIN, Professor, Ph.D., University of Iowa, 1965; 1967.
 BROWN, GEORGE C., Professor, Ph.D., Southern Illinois University, 1963; 1956.
 CLAYTON, CHARLES C., Professor, *Emeritus*, B.J., University of Missouri, 1925; 1955.
 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.
 HART, JIM ALLEE, Professor, *Emeritus*, Ph.D., University of Missouri, 1959; 1965.
 JOHNSON, RALPH H., Assistant Professor, Ph.D., University of Wisconsin, 1975; 1973.
 LONG, HOWARD R., Professor, *Emeritus*, Ph.D., University of Missouri, 1948; 1953.
 McCOY, RALPH E., Professor, *Emeritus*, Ph.D., University of Illinois, 1956; 1955.
 OSTMAN, ROBERT, Assistant Professor, Ph.D., University of Minnesota, 1974; 1975.
 RICE, W. MANION, Associate Professor, Ph.D., Southern Illinois University, 1967; 1959.
 STONECIPHER, HARRY W., Associate Professor, Ph.D., Southern Illinois University, 1971; 1969.
 TRAGER, ROBERT E., Associate Professor, Ph.D., University of Minnesota, 1971; 1973.
 WEBB, JOSEPH M., Assistant Professor and Acting Director, Ph.D., University of Illinois, 1973; 1976.

Library

BAUNER, RUTH E., Associate Professor, S.Ed., Southern Illinois University, 1974; 1956.
 BEDIENT, DOUGLAS, Assistant Professor, Ph.D., Southern Illinois University, 1971; 1971.
 BLACK, GEORGE W., JR., Associate Professor, M.S.L.S., Columbia University, 1966; 1968.
 BOYDSTON, JO ANN, Professor, Ph.D., Columbia University, 1950; 1955.
 CLIFFORD, JOHN, Associate Professor, Ph.D., University of Iowa, 1954; 1955.
 COHN, ALAN M., Professor, M.S., University of Illinois, 1955; 1955.
 DENZEL, HARRY, Assistant Professor, Ph.D., Southern Illinois University, 1971; 1965.
 DUCKETT, KENNETH W., Associate Professor, M.S., University of Wisconsin, 1951; 1965.
 MATTHEWS, SIDNEY E., Associate Professor, M.S.L.S., University of Illinois 1952; 1964.
 PETERSON, KENNETH G., Professor and *Dean*, Ph.D., University of California at Berkeley, 1968; 1976.
 SIMON, JOHN Y., Professor, Ph.D., Harvard University, 1961; 1964.
 WINSOR, DONALD L., Associate Professor, Ed.D., University of Florida, 1961; 1965.

Linguistics (College of Liberal Arts)

CARRELL, PATRICIA L., Associate Professor and *Chairperson*, Ph.D., University of Texas at Austin, 1966; 1968.
 GILBERT, GLENN G., Professor, Ph.D., Harvard University, 1963; 1970.
 KONNEKER, BEVERLY HILL, Assistant Professor, Ph.D., University of Texas at Austin, 1972; 1969.
 NGUYEN, DINH-HOA, Professor, Ph.D., New York University, 1956; 1969.
 PARISH, CHARLES, Professor, Ph.D., University of New Mexico, 1959; 1965.
 PERKINS, ALLAN K., Assistant Professor, Ph.D., University of Michigan, 1976; 1976.
 REDDEN, JAMES E., Professor, Ph.D., Indiana University, 1965; 1967.
 SILVERSTEIN, RAYMOND O., Assistant Professor, Ph.D., University of California at Los Angeles, 1973; 1970.

Marketing (College of Business and Administration)

ADAMS, KENDALL A., Professor, Ph.D., Michigan State University, 1962; 1965.
 ANDERSEN, R. CLIFTON, Professor, D.B.A., Indiana University, 1960; 1967.
 DARLING, JOHN R., JR., Professor, Ph.D., University of Illinois, 1967; 1976.
 DOMMERMUTH, WILLIAM P., Professor, Ph.D., Northwestern University, 1964; 1968.
 HINDERSMAN, CHARLES H., Professor, D.B.A., Indiana University, 1959; 1960.
 MOORE, JAMES R., Assistant Professor, Ph.D., University of Illinois, 1972; 1969.
 PERRY, DONALD L., Associate Professor, Ph.D., University of Illinois, 1966; 1964.
 WALTERS, GLENN, Professor and *Chairman*, Ph.D., University of Illinois, 1964; 1977.

Mathematics (College of Liberal Arts)

BAARTMANS, ALPHONSE H., Associate Professor and *Chairman*, Ph.D., Michigan State University, 1967; 1967.
 BIESTERFELDT, HERMAN, Associate Professor, Ph.D., Pennsylvania State University, 1963; 1968.
 BLACK, AMOS H., Professor, *Emeritus*, Ph.D., Cornell University, 1932; 1948.
 BOUWSMA, WARD, Associate Professor, Ph.D., University of Michigan, 1962; 1967.

- BURTON, THEODORE A., Professor, Ph.D., Washington State University, 1964; 1966.
 CRENSHAW, JAMES A., Associate Professor, Ph.D., University of Illinois, 1967; 1967.
 DANHOF, KENNETH, Associate Professor, Ph.D., Purdue University, 1969; 1969.
 FOLAND, NEAL E., Professor, Ph.D., University of Missouri, 1961; 1965.
 GATES, LESLIE D., Associate Professor, Ph.D., Iowa State University, 1952; 1961.
 GREGORY, JOHN, Associate Professor, Ph.D., University of California at Los Angeles, 1969; 1972.
 GRIMMER, RONALD C., Professor, Ph.D., University of Iowa, 1967; 1967.
 HALL, DILLA, Associate Professor, *Emeritus*, Ph.D., St. Louis University, 1955; 1924.
 HOOKER, JOHN W., Assistant Professor, Ph.D., University of Oklahoma, 1967; 1967.
 HUNSAKER, WORTHEN N., Associate Professor, Ph.D., Washington State University, 1966; 1969.
 KAMMLER, DAVID, Associate Professor, Ph.D., University of Michigan, 1971; 1971.
 KIRK, RONALD B., Associate Professor, Ph.D., California Institute of Technology, 1968; 1968.
 KOCH, CHARLES, Assistant Professor, Ph.D., University of Illinois, 1961; 1966.
 KUIPERS, LAUWERENS, Professor, *Emeritus*, Ph.D., Vrije Universiteit (Amsterdam), 1947; 1966.
 LANGENHOP, CARL E., Professor, Ph.D., Iowa State University, 1948; 1961.
 MARK, ABRAHAM M., Professor, Ph.D., Cornell University, 1947; 1950.
 MAXWELL, CHARLES, Professor, Ph.D., University of Illinois, 1955; 1963.
 McDANIEL, WILBUR C., Professor, *Emeritus*, Ph.D., University of Wisconsin, 1939; 1939.
 MILLMAN, RICHARD, Associate Professor, Ph.D., Cornell University, 1971; 1971.
 MOORE, ROBERT A., Associate Professor, Ph.D., Indiana University, 1962; 1965.
 NATHANSON, MELVYN B., Associate Professor, Ph.D., University of Rochester, 1971; 1971.
 OLMSTED, JOHN M. H., Professor, *Emeritus*, Ph.D., Princeton University, 1940; 1960.
 PAINE, THOMAS B., Assistant Professor, Ph.D., University of Oregon, 1966; 1966.
 PANCHAPAKESAN, S., Associate Professor, Ph.D., Purdue University, 1969; 1970.
 PARKER, GEORGE D., Assistant Professor, Ph.D., University of California at San Diego, 1971; 1972.
 PATULA, WILLIAM T., Assistant Professor, Ph.D., Carnegie-Mellon University, 1972; 1972.
 PEDERSEN, FRANKLIN D., Associate Professor, Ph.D., Tulane University, 1967; 1965.
 PEDERSEN, KATHERINE, Assistant Professor, Ph.D., Tulane University, 1969; 1965.
 SELDIN, JONATHAN P., Assistant Professor, Ph.D., University of Amsterdam, 1968; 1969.
 SHOCK, ROBERT C., Associate Professor, Ph.D., University of North Carolina, 1969; 1969.
 SKALSKY, MICHAEL, Professor, D.Nat.Sc., University of Göttingen, 1949; 1957.
 SNYDER, HERBERT H., Professor, Ph.D., Lehigh University, 1965; Ph.D., University of South Africa, 1972; 1966.
 STARKS, THOMAS H., Associate Professor, Ph.D., Virginia Polytechnic Institute, 1959; 1961.
 TOWNSEND, CARL, Associate Professor, Ph.D., Washington State University, 1965; 1965.
 WILSON, JOSEPH C., Professor, Ph.D., Louisiana State University, 1954; 1957.

Microbiology (College of Science)

- BOWSER, DEAN V., Assistant Professor, Ph.D., University of Georgia, 1971; 1972.
 CASTER, JOHN, Assistant Professor, Ph.D., St. Louis University, 1968; 1972.
 COOPER, MORRIS D., Assistant Professor, Ph.D., University of Georgia, 1971; 1973.
 JACKSON, ROBERT, Professor, Ph.D., Purdue University, 1963; 1974.
 LINDEGREN, CARL C., Professor, *Emeritus*, Ph.D., California Institute of Technology, 1931; 1947.
 McCLARY, DAN O., Professor, Ph.D., Washington University, 1951; 1951.
 MYERS, WALTER L., Professor, Ph.D., University of Wisconsin, 1962; 1973.
 OGUR, MAURICE, Professor and *Chairman*, Ph.D., Columbia University, 1948; 1953.
 ROUHANDEH, HASSAN, Professor, Ph.D., Kansas State University, 1959; 1967.
 ROWAN, DIGHTON F., Professor, Ph.D., Stanford University, 1954; 1973.
 SHECHMEISTER, ISAAC L., Professor, Ph.D., University of California at Berkeley, 1949; 1957.
 TEWARI, RAM P., Professor, Ph.D., Ohio State University, 1954; 1973.

Music (College of Communications and Fine Arts)

- BARWICK, STEVEN, Professor, Ph.D., Harvard University, 1949; 1955.
 BATEMAN, MARIANNE WEBB, Professor, M.Mus., University of Michigan, 1959; 1965.
 BERGT, ROBERT, Associate Professor, S.T.M., Concordia Seminary, 1958; 1974.
 BOE, JOHN, Associate Professor, Northwestern University, 1969; 1971.
 BOTTJE, WILL GAY, Professor, A.Mus.D., Eastman School of Music, 1955; 1957.
 COKER, WILSON W., Professor, D.M.A., University of Illinois, 1965; 1975.

- DENKER, FRED, Professor, *Emeritus*, Ph.D., Eastman School of Music, 1951; 1957.
 EDDINS, JOHN, Assistant Professor, Ph.D., Florida State University, 1966; 1969.
 FLOYD, SAMUEL, Associate Professor, Ph.D., Southern Illinois University, 1969; 1968.
 GORDON, RODERICK, Professor, Ph.D., University of Wisconsin, 1953; 1963.
 GRIZZELL, MARY JANE, Assistant Professor, M.Mus., Eastman School of Music, 1943; 1959.
 HANES, MICHAEL D., Assistant Professor, M.M.Ed., Southern Illinois University, 1965; 1970.
 HUNT, C. B., JR., Professor, University of California, Los Angeles, 1949; 1974.
 HUSSEY, GEORGE, Associate Professor, M.A.Ed., Washington University, 1963; 1963.
 KAGEFF, BURT, Professor, A.M., University of Missouri, 1962; 1969.
 KINGSBURY, ROBERT, Associate Professor, M.Mus., Northwestern University, 1952; 1961.
 KOENIGSTEIN, NICHOLAS, Assistant Professor, M.Mus., West Virginia University, 1956; 1967.
 LAWRENCE, MARJORIE, Professor, *Emerita*; 1960.
 LEMASTERS, DONALD, Instructor, M.Mus., Northwestern University, 1949; 1967.
 McHUGH, CATHERINE, Professor, Ed.D., Columbia University, 1959; 1969.
 McINTOSH, DAVID, Associate Professor, *Emeritus*, M.A., University of Iowa, 1935; 1927.
 MUELLER, ROBERT, Professor, Ph.D., Indiana University, 1964; 1948.
 OLSSON, PHILLIP, Professor and Director, M.Mus., Chicago Conservatory, 1949; 1949.
 POULOS, HELEN, Assistant Professor, D.M., Indiana University, 1971; 1969.
 RESNICK, ROBERT, Professor, M.Mus., Wichita State University, 1949; 1949.
 SIENER, MELVIN, Associate Professor, M.A., University of Iowa, 1954; 1962.
 TAYLOR, CHARLES, Associate Professor, Ed.D., Columbia University, 1950-1957.
 UNDERWOOD, JERVIS, Associate Professor, Ph.D., North Texas State University, 1970, 1971.
 WALLACE, MARY ELAINE, Professor, M.Mus., University of Illinois, 1954; 1969.
 WERNER, KENT, Associate Professor, Ph.D., University of Iowa, 1966; 1963.
 WHARTON, JOHN, Associate Professor, *Emeritus*, M.Mus., American Conservatory, 1940; 1945.

Philosophy (College of Liberal Arts)

- AUDI, MICHAEL N., Associate Professor, Ph.D., Johns Hopkins University, 1970; 1970.
 CLARKE, DAVID S., JR., Associate Professor, Ph.D., Emory University, 1964; 1966.
 DIFFENBECK, JAMES A., Professor, Ph.D., Harvard University, 1950; 1950.
 EAMES, ELIZABETH R., Professor, Ph.D., Bryn Mawr College, 1951; 1963.
 EAMES, S. MORRIS, Professor, Ph.D., University of Chicago, 1958; 1963.
 FRONDIZI, RISIERI, Professor, Ph.D., National University of Mexico, 1950; 1970.
 GILLAN, GARTH J., Associate Professor, Ph.D., Duquesne University, 1966; 1969.
 HAHN, LEWIS E., Research Professor, *Emeritus*, Ph.D., University of California, 1939; 1963.
 HAYWARD, JOHN, Professor, Ph.D., University of Chicago, 1949; 1968.
 HOWIE, JOHN, Associate Professor, Ph.D., Boston University, 1965; 1966.
 KELLY, MATTHEW J., Associate Professor, Ph.D., University of Notre Dame, 1963; 1966.
 LIU, SHU-HSIEN, Professor, Ph.D., Southern Illinois University, 1966; 1966.
 McCLURE, GEORGE T., Professor and *Chairman*, Ph.D., Ohio State University, 1958; 1958.
 MIJUSKOVIC, BEN L., Associate Professor, Ph.D., University of California at San Diego, 1972; 1972.
 MOORE, WILLIS, Professor, *Emeritus*, Ph.D., University of California, 1936; 1955.
 PLOCHMANN, GEORGE KIMBALL, Professor, Ph.D., University of Chicago, 1950; 1949.
 SCHEDLER, GEORGE, Associate Professor, Ph.D., University of California at San Diego, 1973; 1973.
 SCHILPP, PAUL A., Visiting Professor, Ph.D., Stanford University, 1936; 1965.
 TENNEY, CHARLES, University Professor, *Emeritus*, Ph.D., University of Oregon, 1931; 1931.

Physical Education (College of Education)

- ACKERMAN, KENNETH, Assistant Professor, M.A., Michigan State University, 1959; 1969.
 CARROLL, PETER, Assistant Professor, Ph.D., Pennsylvania State University, 1970; 1969.
 DAVIES, DOROTHY R., Professor, *Emerita*, Ed.D., University of Cincinnati, 1944; 1939.
 FRANKLIN, C. C., Associate Professor, M.S. Ed., Indiana University, 1946; 1948.
 GOOD, LARRY, Associate Professor, Ed.D., Temple University, 1968; 1967.
 KNOWLTON, RONALD, Professor, Ph.D., University of Illinois, 1961; 1961.
 LEFEVERS, VICTORIA A., Assistant Professor, Ph.D., Texas Woman's University, 1971; 1974.

- POTTER, MARJORIE BOND, Professor, *Emerita*, Ph.D., University of Southern California, 1958; 1961.
 SHEA, EDWARD, Professor, Ph.D., New York University, 1955; 1954.
 SPACKMAN, ROBERT, Associate Professor, M.S.Ed., Southern Illinois University, 1960, 1957.
 STEHR, JEAN, Associate Professor, M.A., Texas Woman's University, 1945; 1944.
 STOTLAR, JOHN, Associate Professor, D.P.Ed., Indiana University, 1954; 1948.
 THORPE, JO ANNE LEE, Professor, Ph.D., Texas Woman's University, 1964; 1958.
 WEST, CHARLOTTE, Professor, Ph.D., University of Wisconsin, 1969; 1957.
 WILKINSON, JAMES, Associate Professor and *Acting Chairman*, D.P.Ed., Indiana University, 1958; 1951.
 ZIMMERMAN, HELEN, Professor, *Emerita*, Ph.D., University of Wisconsin, 1951; 1952.

Physics and Astronomy (College of Science)

- ARVIN, MARTIN J., Professor, *Emeritus*, Ph.D., University of Illinois, 1934; 1949.
 BORST, WALTER L., Associate Professor, Ph.D., University of California, Berkeley, 1968; 1971.
 BOSE, SUBIR K., Associate Professor, Ph.D., University of Allahabad, India, 1967; 1968.
 BRASEFIELD, CHARLES J., Professor, *Emeritus*, Ph.D., Princeton University, 1927; 1954.
 CHANG-FANG, CHUEN-CHUEN, Assistant Professor, Ph.D., Duke University, 1961; 1971.
 CUTNELL, JOHN D., Associate Professor, Ph.D., University of Wisconsin, 1967; 1968.
 GRUBER, BRUNO J., Professor, Ph.D., University of Vienna, Austria, 1961; 1972.
 HENNEBERGER, WALTER C., Professor, Ph.D., Göttingen University, Germany, 1959; 1963.
 JOHNSON, KENNETH W., Associate Professor, Ph.D., Ohio State University, 1967; 1970.
 NICKELL, WILLIAM E., Professor, Ph.D., University of Iowa, 1954; 1963.
 SANDERS, FRANK C., JR., Associate Professor, Ph.D., University of Texas, 1968; 1969.
 SAPOROSCHENKO, MYKOLA, Associate Professor, Ph.D., Washington University, 1958; 1965.
 WATSON, RICHARD E., Professor and *Chairman*, Ph.D., University of Illinois, 1938; 1958.
 YOUNG, OTIS B., Professor, *Emeritus*, Ph.D., University of Illinois, 1928; 1929.
 ZITTER, ROBERT N., Professor, Ph.D., University of Chicago, 1962; 1967.

Physiology (College of Science)

- BANERJEE, CHANDRA M., Professor, M.D., University of Calcutta, India, Ph.D., Medical College of Virginia, 1967; 1974.
 BOELKINS, JAMES N., Assistant Professor, Ph.D., University of Missouri, 1971; 1975.
 BROWNING, RONALD A., Associate Professor, Ph.D., University of Illinois Medical Center, Chicago, 1971; 1973.
 CASPARY, DONALD M., Associate Professor, Ph.D., New York University, 1971; 1972.
 CLINE, WILLIAM H., JR., Professor, Ph.D., West Virginia University, 1965; 1973.
 DOORENBOS, NORMAN, Professor, Ph.D., University of Michigan, 1954; 1977.
 DUNAGAN, TOMMY T., Professor, Ph.D., Purdue University, 1960; 1962.
 ELLERT, MARTHA S., Associate Professor, Ph.D., University of Miami, 1968; 1975.
 ESTAVILLO, JAIME A., Assistant Professor, Ph.D., University of California, Davis, 1970; 1975.
 FAINGOLD, CARL L., Associate Professor, Ph.D., Northwestern University, 1970; 1972.
 FALVO, RICHARD E., Assistant Professor, Ph.D., University of Wyoming, 1970; 1973.
 FOOTE, FLORENCE M., Professor, *Emerita*, Ph.D., University of Iowa, 1940; 1963.
 FREUND, MATTHEW, Professor and *Chairman*, Ph.D., Rutgers University, 1958; 1976.
 GASS, GEORGE H., Professor, Ph.D., Ohio State University, 1955; 1959.
 HUNTER, WILLIAM S., Associate Professor, Ph.D., Michigan State University, 1971; 1975.
 KAPLAN, HAROLD M., Professor, *Emeritus*, Ph.D., Harvard University, 1933; 1949.
 LEHR, ROBERT P., JR., Associate Professor, Ph.D., Baylor University, 1971; 1973.
 MICKUS, JOHN C., Assistant Professor, Ph.D., Southern Illinois University, 1972; 1974.
 MILLER, DONALD M., Professor, Ph.D., University of Illinois, 1965; 1966.
 MILLER, GINGER, Assistant Professor, Ph.D., Baylor University, 1976; 1977.
 MYERS, J. HURLEY, Associate Professor, Ph.D., University of Tennessee School of Medicine, 1969; 1971;
 NEQUIN, LYNN G., Associate Professor, Ph.D., University of Illinois Medical School, 1970; 1973.
 PARKE, WESLEY W., Professor, Ph.D., University of Connecticut, 1957; 1974.
 PETERSON, RUDOLPH N., Associate Professor, Ph.D., University of Florida, 1965; 1976.
 RICHARDSON, ALFRED W., Professor, Ph.D., University of Iowa, 1949; 1966.
 RUSSELL, LONNIE D., Associate Professor, Ph.D., University of Nebraska, 1974; 1977.
 SOLLBERGER, ARNE R., Professor, M.D., Caroline Institute, Sweden, 1957; 1972.
 SOMANI, SATU M., Associate Professor, Ph.D., Liverpool University, England, 1969; 1974.

WINET, HOWARD, Associate Professor, Ph.D., University of California at Los Angeles, 1969; 1977.

YAU, WILLIAM M., Assistant Professor, Ph.D., Medical College of Virginia, 1971; 1973.

Plant and Soil Science (College of Agriculture)

CASTER, ALFRED B., Professor, *Emeritus*, Ph.D., University of Arizona, 1941; 1957.

COORTS, GERALD D., Professor, and *Chairman*, Ph.D., University of Illinois, 1964; 1968.

ELKINS, DONALD M., Professor, Ph.D., Auburn University, 1967; 1967.

HILLYER, IRVIN G., Professor, Ph.D., Michigan State University, 1956; 1956.

JONES, JOE H., Associate Professor, Ph.D., Ohio State University, 1960; 1964.

KAPUSTA, GEORGE, Associate Professor, Ph.D., Southern Illinois University, 1975; 1964.

LEASURE, J. K., Professor, Ph.D., University of Illinois, 1953; 1966.

MALEIKE, RAYMOND R., Assistant Professor, Ph.D., Virginia Polytechnic Institute, 1974; 1973.

MOWRY, JAMES B., Professor, Ph.D., Rutgers University, 1951; 1951.

MYERS, OVAL, JR., Professor, Ph.D., Cornell University, 1963; 1968.

OLSEN, FARREL J., Associate Professor, Ph.D., Rutgers University, 1961; 1971.

PORTZ, HERBERT L., Professor, Ph.D., University of Illinois, 1954; 1954.

SATCHELL, DONALD P., Associate Professor, Ph.D., North Carolina State University, 1951; 1969.

STUCKY, DONALD J., Associate Professor, Ph.D., Purdue University, 1963; 1970.

TWEEDY, JAMES A., Professor, Ph.D., Michigan State University, 1966; 1966.

VARSA, EDWARD C., Assistant Professor, Ph.D., Michigan State University, 1970; 1970.

Political Science (College of Liberal Arts)

ALEXANDER, ORVILLE, Professor, *Emeritus*, Ph.D., University of Iowa, 1936; 1938.

BAKER, JOHN H., Associate Professor and *Chairman*, Ph.D., Princeton University, 1961; 1966.

CHOU, IKUA, Professor, Ph.D., Fletcher School of Law and Diplomacy, 1949; 1964.

DALE, RICHARD, Associate Professor, Ph.D., Princeton University, 1962; 1966.

DERGE, DAVID RICHARD, Professor, Ph.D., Northwestern University, 1955; 1972.

ERVIN, OSBIN L., Assistant Professor, Ph.D., University of Tennessee, 1974; 1974.

FOSTER, JOHN L., Assistant Professor, Ph.D., University of Minnesota, 1971; 1975.

GARNER, WILLIAM R., Associate Professor, Ph.D., Tulane University, 1963; 1966.

GOODSELL, CHARLES T., Professor, Ph.D., Harvard University, 1961; 1966.

HANSON, EARL THOMAS, Professor, *Emeritus*, Ph.D., University of Illinois, 1948; 1960.

HARDENBERGH, WILLIAM, Professor, Ph.D., University of Illinois, 1954; 1960.

ISAKOFF, JACK F., Professor, *Emeritus*, Ph.D., University of Illinois, 1937; 1962.

JACKSON, JOHN S., III, Associate Professor, Ph.D., Vanderbilt University, 1971; 1969.

JACOBINI, HORACE B., Professor, Ph.D., University of Kansas, 1951; 1957.

KAMARASY, EGON K., Assistant Professor, Doctor Pllitics, Budapest University, Hungary, 1942; 1959.

KENNEY, DAVID T., Professor, Ph.D., University of Illinois, 1952; 1951.

KLINGBERG, FRANK L., Professor, *Emeritus*, Ph.D., University of Chicago, 1938; 1946.

LANDECKER, MANFRED, Associate Professor, Ph.D., Johns Hopkins University, 1965; 1959.

MACE, GEORGE R., Associate Professor, Ph.D., Claremont Graduate School, 1963; 1970.

McGRATH, ROBERT A., Professor, *Emeritus*, Ph.D., University of Iowa, 1947; 1949.

MILLER, ROY E., Assistant Professor, Ph.D., University of Illinois, 1971; 1967.

MORTON, WARD M., Professor, *Emeritus*, Ph.D., University of Texas, 1941; 1949. 1955.

NELSON, RANDALL H., Professor, Ph.D., University of Michigan, 1956; 1955.

PAINE, JOANN P., Associate Professor, Ph.D., University of Oregon, 1967; 1966.

RIDGEWAY, MARIAN E., Professor, *Emerita*, Ph.D., University of Illinois, 1952; 1952.

STAUBER, LELAND G., Associate Professor, Ph.D., Harvard University, 1964; 1966.

TURLEY, WILLIAM S., Associate Professor, Ph.D., University of Washington, 1972; 1971.

TURNER, MAX W., Professor, Ph.D., University of Iowa, 1947; 1947.

VAN DER SLIK, JACK, Associate Professor, Ph.D., Michigan State University, 1967; 1967.

WASBY, STEPHEN L., Professor, Ph.D., University of Oregon, 1962; 1966.

Psychology (College of Liberal Arts)

BAEZ, LUIS A., Assistant Professor, Ph.D., Princeton University, 1973; 1974.

BEKKER, L. DEMOYNE, Associate Professor, Ph.D., Ohio State University, 1968; 1969.

BLISS, DAVID K., Associate Professor, Ph.D., University of California at Berkeley, 1968; 1974.

BRUTTEN, GENE J., Professor, Ph.D., University of Illinois, 1957; 1957.

BUCK, TERENCE D., Associate Professor, Ph.D., University of Missouri, 1968; 1969.

CARRIER, NEIL A., Professor, Ph.D., University of Michigan, 1956; 1957.

DOLLINGER, STEPHEN, Assistant Professor, Ph.D., University of Missouri, 1977; 1977.

- DURLAK, JOSEPH A., Assistant Professor, Ph.D., Vanderbilt University, 1971; 1976.
 EHRENFREUND, DAVID, Professor and *Chairman*, Ph.D., State University of Iowa, 1947; 1962.
 GRAHAM, JACK W., Professor, Ph.D., Purdue University, 1951; 1951.
 HARRIN, VINCENT A., Professor, Ph.D., University of Texas, 1964; 1968.
 HAYNES, STEPHEN N., Associate Professor, Ph.D., University of Colorado, 1971; 1976.
 HELMS, JANET, Assistant Professor, Ph.D., Iowa State University, 1975; 1977.
 KELLEY, NOBLE, H., Professor, *Emeritus*, Ph.D., State University of Iowa, 1936; 1951.
 LIT, ALFRED, Professor, Ph.D., Columbia University, 1948; 1961.
 McHOSE, JAMES H., Professor, Ph.D., University of Iowa, 1961; 1961.
 McKILLIP, JOHN A., Assistant Professor, Ph.D., Loyola University of Chicago, 1974; 1975.
 McNEEL, STEVEN P., Associate Professor, Ph.D., University of California, Santa Barbara, 1969; 1970.
 MELTZER, DONALD, Professor, Ph.D., University of Pittsburg, 1963; 1966.
 MILLER, H. RICHARD, Associate Professor, Ph.D., University of Missouri, 1967; 1973.
 MITCHELL, THOMAS O., Associate Professor, Ph.D., University of Colorado, 1969; 1968.
 MOLFESE, DENNIS L., Associate Professor, Ph.D., Pennsylvania State University, 1972; 1972.
 MOLFESE, VICTORIA, J., Assistant Professor, Ph.D., Pennsylvania State University, 1974; 1972.
 MORELAND, JOHN R., Associate Professor, Ph.D., University of Massachusetts, 1971; 1973.
 O'DONNELL, JAMES P., Associate Professor, Ph.D., University of Pittsburgh, 1965; 1965.
 PITZ, GORDON F., Professor, Ph.D., Carnegie-Mellon University, 1963; 1963.
 PURCELL, THOMAS D., Associate Professor, Ph.D., Southern Illinois University, 1965; 1960.
 RADER, GORDON E., Professor, Ph.D., Yale University, 1956; 1968.
 RADTKE, ROBERT C., Associate Professor, Ph.D., State University of Iowa, 1963; 1966.
 RAFFERTY, JANET E., Professor, Ph.D., Ohio State University, 1952; 1954.
 RAMANAIAH, NERELLA, Associate Professor, Ph.D., University of Oregon, 1971; 1971.
 RINGUETTE, EUGENE L., Associate Professor, Ph.D., Purdue University, 1963; 1967.
 SCHILL, THOMAS R., Professor, Ph.D., Oklahoma State University, 1963; 1963.
 SCHMECK, RONALD R., Associate Professor, Ph.D., Ohio University, 1969; 1969.
 SHOEMAKER, DONALD J., Professor, Ph.D., Ohio State University, 1955; 1960.
 SNYDER, JOHN F., Associate Professor, Ph.D., Loyola University, 1965; 1968.
 TINSLEY, HOWARD E. A., Associate Professor, Ph.D., University of Minnesota, 1971; 1973.
 WESTBERG, WILLIAM C., Professor, Ph.D., Pennsylvania State University, 1948; 1952.

Radio-Television (College of Communications and Fine Arts)

- DYBVIG, HOMER E., Associate Professor, Ph.D., Southern Illinois University, 1970; 1961.
 HILDRETH, RICHARD, Assistant Professor, M.S., Syracuse University, 1968; 1968.
 KURTZ, JOHN L., Assistant Professor, Ph.D., Southern Illinois University, 1973; 1962.
 LYNCH, CHARLES T., Associate Professor and *Chairman*, Ph.D., Southern Illinois University, 1972; 1967.
 OLSON, THOMAS O., Assistant Professor, Ph.D., Wayne State University, 1966; 1971.
 ROBBINS, BUREN C., Associate Professor, *Emeritus*, M.A., University of Iowa, 1935; 1949.
 RYAN, STEVE S., Assistant Professor, Ph.D., Ohio State University, 1974; 1976.
 SHIPLEY, CHARLES W., Professor, Ph.D., Florida State University, 1971; 1971.
 TERWISCHE, DAVID K., Assistant Professor, Ph.D., University of Missouri, 1971; 1970.

Recreation (College of Education)

- FREEBERG, WILLIAM, Professor, D. Rec., Indiana University, 1950; 1942.
 McEWEN, DOUGLAS, Assistant Professor, Ph.D., Michigan State University, 1973; 1975.
 O'BRIEN, WILLIAM, Professor, and *Chairman*, D. Rec., Indiana University, 1967; 1948.
 SMITH, OWEN R., Assistant Professor, Ph.D., University of Utah, 1974; 1974.
 TAYLOR, LOREN, Professor, *Emeritus*, Ed.D., Columbia University, 1957; 1957.

Rehabilitation Institute (College of Human Resources)

- ALLEN, HARRY A., Associate Professor, Ed.D., University of Arkansas, 1971; 1970.
 AZRIN, NATHAN H., Professor, Ph.D., Harvard University, 1956; 1958.
 BAKER, RICHARD J., Associate Professor, Ed.D., Auburn University, 1972; 1974.
 BENDER, ELEANOR, Assistant Professor, M.S., Southern Illinois University, 1972; 1961.
 BRYSON, SEYMOUR L., Associate Professor, Ph.D., Southern Illinois University, 1972; 1969.
 CRAIG, KAREN E., Associate Professor, Ph.D., Purdue University, 1969; 1967.
 CUVO, ANTHONY J., Associate Professor, Ph.D., University of Connecticut, 1973; 1973.

- DICKEY, THOMAS W., Associate Professor, *Emeritus*, M.A., Southern Illinois University, 1964; 1964.
- GARDNER, MARGARET S., Associate Professor, Ph.D., Northwestern University, 1960; 1968.
- GRENFELL, JOHN E., Professor, Ed.D., Oregon State University, 1966, 1966.
- HAWLEY, IRENE B., Assistant Professor, Ph.D., Southern Illinois University, 1973; 1968.
- HENSON, DONALD E., Visiting Assistant Professor, Ph.D., Southern Illinois University at Carbondale, 1977; 1977.
- LEE, ROBERT E., Associate Professor, *Emeritus*, Ph.D., University of Minnesota, 1964; 1964.
- LORENZ, JEROME R., Associate Professor, Ph.D., University of Wisconsin, 1973; 1973.
- MCDONALD, A. ANDREW, Assistant Professor, Ph.D., University of Wisconsin at Milwaukee, 1976; 1976.
- MIRANTI, JOSEPH P., Professor, M.D., Loyola University of Chicago, 1950; 1961.
- PETERS, JAMES S., Visiting Professor, Ph.D., Purdue University, 1955; 1977.
- POPPE, ROGER L., Associate Professor, Ph.D., Stanford University, 1968; 1970.
- RENZAGLIA, GUY A., Professor, and *Director*, Ph.D., University of Minnesota, 1952; 1955.
- ROBINSON, WALTER G., Assistant Professor, Ph.D., Southern Illinois University at Carbondale, 1976; 1968.
- RUBIN, HARRIS B., Associate Professor, Ph.D., University of Chicago, 1965; 1966.
- SAWYER, HORACE W., Associate Professor, Ed.D., Auburn University, 1973; 1977.
- SCHUMACHER, BROCKMAN, Professor, Ph.D., Washington University, 1969; 1967.
- VICECELI, LOUIS, Associate Professor, M.S. Ed., Southern Illinois University, 1959; 1958.

Religious Studies (College of Liberal Arts)

- HAYWARD, JOHN F., Professor and *Chairman*, Ph.D., University of Chicago, 1949; 1968.
- LEMERT, CHARLES C., Associate Professor, Ph.D., Harvard University, 1972; 1971.

Social and Community Service (College of Human Resources)

- AUERBACH, ARNOLD J., Professor, Ph.D., University of Pittsburgh, 1961; 1972.
- ALLIBAND, TERRY, Assistant Professor, Ph.D., University of Iowa, 1974.
- BHATTACHARYYA, JNANABROTA, Associate Professor, Ph.D., University of Delhi, India, 1969; 1968.
- BROWN, TALLON H., Assistant Professor, Ph.D., Southern Illinois University at Carbondale, 1975; 1963.
- CHARLES, EUNICE A., Assistant Professor, Ph.D., Boston University, 1973; 1974.
- DENISE, PAUL S., Assistant Professor, Ph.D., University of California, Berkeley, 1974; 1968.
- EHRlich, IRA F., Professor, and *Director*, D.S.W., Washington University, 1970; 1976.
- HANSON, JAMES M., Assistant Professor, Ph.D., Southern Illinois University, 1974; 1974.
- POSTON, RICHARD, Professor, *Emeritus*, B.A., University of Montana, 1940; 1953.
- ROSEN, ANITA L., Visiting Assistant Professor, Ph.D., Southern Illinois University, 1975; 1971.
- SMITH, STANLEY H., Professor, Ph.D., Washington State University, 1953; 1973.
- THOMAS, RICHARD M., Professor, D.Ed., University of California, Los Angeles, 1964; 1966.
- WAKELEY, RAYMOND E., Professor, *Emeritus*, Ph.D., Cornell University, 1928; 1961.

Sociology (College of Liberal Arts)

- ALIX, ERNEST K., Associate Professor, Ph.D., Southern Illinois University, 1966; 1967.
- BROOKS, MELVIN, Associate Professor, Ph.D., University of Wisconsin, 1941; 1956.
- BURGER, THOMAS, Professor, Ph.D., Duke University, 1972; 1973.
- EYNON, THOMAS G., Professor, Ph.D., Ohio State University, 1959; 1968.
- GASTON, JERRY C., Associate Professor and *Chairperson*, Ph.D., Yale University, 1969; 1969.
- GREENSTEIN, THEODORE, Assistant Professor, Ph.D., Washington State University, 1976; 1976.
- HAWKES, ROLAND K., Associate Professor, Ph.D., Johns Hopkins University, 1967; 1970.
- HENDRIX, LEWELLYN, Assistant Professor, Ph.D., Princeton University, 1974; 1971.
- JOHNSON, ELMER H., Professor, Ph.D., University of Wisconsin, 1950; 1966.
- LANTZ, HERMAN R., Professor, Ph.D., Ohio State University, 1950; 1950.
- LEMERT, CHARLES C., Assistant Professor, Ph.D., Harvard University, 1972; 1971.
- MARCUM, JOHN P., JR., Assistant Professor, Ph.D., University of Texas, 1976; 1976.
- MEDDIN, JAY R., Assistant Professor, Ph.D., University of Kentucky, 1973; 1972.
- MUNCH, PETER A., Professor, *Emeritus*, Ph.D., University of Oslo, 1946; 1957.

NALL, FRANK C., II, Associate Professor, Ph.D., Michigan State University, 1959; 1964.
 SNYDER, CHARLES R., Professor, Ph.D., Yale University, 1954; 1960.

Special Education (College of Education)

BRECHT, RICHARD, Assistant Professor, Ed.D., University of Missouri, 1973; 1973.
 CASEY, JOHN P., Professor, Ed.D., Indiana University, 1963; 1964.
 CROWNER, JAMES, Professor, Ph.D., Michigan State University, 1960; 1966.
 EWING, NORMA J., Assistant Professor, Ph.D., Southern Illinois University, 1974; 1973.
 HISAMA, TOSHIAKI, Assistant Professor, Ph.D., University of Oregon, 1971; 1971.
 JOINER, LEE M., Professor, Ph.D., Michigan State University, 1966; 1968.
 JUUL, KRISTEND, Professor, Ph.D., Wayne State University, 1953; 1970.
 MCKAY, ELIZABETH B., Associate Professor, *Emerita*, Ph.D., Syracuse University, 1952;
 1952.
 MORGAN, HOWARD, Professor, and *Acting Chairman*, Ed.D., Wayne State University,
 1962; 1969.
 RAINEY, DAN, Assistant Professor, M.S.Ed., Southern Illinois University, 1956; 1957.
 STEPHENS, WYATT E., Professor, Ph.D., University of Oklahoma, 1963; 1969.
 STONEBURNER, ROBERT L., Assistant Professor, Ph.D., University of Illinois, 1974; 1973.
 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.
 BYTWERK, RANDALL L., Assistant Professor, Northwestern University, 1975; 1975.
 DEETZ, STANLEY, Assistant Professor, Ph.D., Ohio University, 1973; 1977.
 FISH, ROBERT A., Assistant Professor, Ph.D., University of Oklahoma, 1970; 1970.
 HIBBS, R. P., Professor, *Emeritus*, A.M., University of Wisconsin, 1942; 1965.
 HIGGINBOTHAM, DOROTHY, Professor, Ph.D., Northwestern University, 1961; 1974.
 HOLDRIDGE, WILLIAM E., Assistant Professor, Ph.D., University of Illinois, 1974; 1977.
 KLEINAU, MARVIN D., Assistant Professor, Ph.D., Southern Illinois University at Car-
 bondale, 1977; 1963.
 KLEINAU, MARION L., Professor, Ph.D., University of Wisconsin, 1961; 1959.
 LANIGAN, RICHARD L., Associate Professor, Ph.D., Southern Illinois University, 1969;
 1974.
 McDONALD, DONALD, Associate Professor, Ph.D., Michigan State University, 1971; 1976.
 McGLONE, EDWARD L., Professor and *Chairman*, Ph.D., Ohio University, 1967; 1975.
 McHUGHES, JANET LARSEN, Assistant Professor, Ph.D., Northwestern University, 1972;
 1973.
 MICKEN, RALPH A., Professor, *Emeritus*, Ph.D., Northwestern University, 1948; 1957.
 PACE, THOMAS J., Professor, Ph.D., University of Denver, 1957; 1965.
 POTTER, DAVID J., Professor, *Emeritus*, Ph.D., Columbia University, 1943; 1960.
 SANDERS, KEITH R., Professor, Ph.D., University of Pittsburgh, 1968; 1967.
 SMITH, WILLIAM D., Associate Professor, Ph.D., Southern Illinois University, 1964; 1961.
 TALLEY, C. HORTON, Professor, *Emeritus*, Ph.D., State University of Iowa, 1936; 1948.

Speech Pathology and Audiology (College of Communications and Fine Arts)

ANDERSON, JOHN O., Professor, Ph.D., Ohio State University, 1950; 1950.
 BLACHE, STEPHEN E., Assistant Professor, Ph.D., Ohio University, 1970; 1971.
 BRACKETT, ISAAC P., Professor, Ph.D., Northwestern University, 1947; 1951.
 BRUTTEN, GENE J., Professor, Ph.D., University of Illinois, 1957; 1957.
 GARBUTT, CAMERON W., Associate Professor, *Emeritus*, Ph.D., Louisiana State Univer-
 sity, 1951; 1947.
 HOSHIKO, MICHAEL S., Professor, Ph.D., Purdue University, 1957; 1957.
 KOEPP-BAKER, HERBERT, Professor, *Emeritus*, Ph.D., University of Iowa, 1938; 1961.
 MONCUR, JOHN P., Professor and *Chairman*, Ph.D., Stanford University, 1950; 1972.
 PACE, SUE A., Professor, Ph.D., Northwestern University, 1966; 1965.

Technical Careers, School of

ASHWORTH, EDWIN ROBERT, Assistant Professor, Ph.D., Southern Illinois University,
 1972; 1963.
 BUSHEE, ELEANOR J., Professor, D.D.S., Northwestern University, 1948; 1963.
 CALDWELL, PAUL, Associate Professor, M.S. Ed., Southern Illinois University, 1965; 1960.
 DALLMAN, MURNICE H., Associate Professor, M.S. Ed., Southern Illinois University,
 1960; 1954.
 DAROSA, EDMUND A., Professor, B.A., College of Saint Joseph, Portugal, 1936; 1964.

- EDWARDS, MARY CATHERINE, Associate Professor, M.A.Ed., University of San Francisco, 1962; 1975.
 HERTZ, Donald G., Associate Professor, Ed.M., University of Oklahoma, 1953; 1965.
 JOHNSTON, CHESTER E., Associate Professor, A.M., George Peabody College of Teachers, 1953; 1955.
 KUSEK, ROBERT W., Associate Professor, Ed.D., Boston University, 1974; 1975.
 LAMPMAN, DUNCAN L., Associate Professor, M.S.Ed., Southern Illinois University, 1956; 1954.
 LITTLE, HAROLD, Associate Professor, B.S., Pennsylvania State University, 1951; 1964.
 MIRIANI, THERESA B., Associate Professor, M.S., University of Denver, 1946; 1960.
 MUHICH, FRANK W., Associate Professor, M.S. in Ed., Southern Illinois University, 1957; 1952.
 PRATT, ARDEN L., Professor, and *Dean*, Ed.D., State University of New York at Buffalo, 1968; 1971.
 REYNOLDS, JOHN, Associate Professor, Ph.D., Southern Illinois University, 1971; 1974.
 ROBB, JAMES, Associate Professor, Ph.D., Southern Illinois University, 1974; 1962.
 RUTLEDGE, CLIFTON D., Associate Professor, M.Arch., Kansas State University, 1968; 1965.
 SODERSTROM, HARRY, Professor, M.S., Bradley University, 1952; 1962.
 TRAYLOR, GEORGE LELON, Associate Professor, M.S.Ed., Southern Illinois University, 1965; 1957.
 TROTTER, GENE, Associate Professor, B.S., North Dakota State University, 1939; 1973.
 VAUGHN, FRANK EUGENE, Associate Professor, M.S.Ed., Southern Illinois University, 1961; 1952.
 WORKUN, ARTHUR E., Associate Professor, M.S.Ed., Illinois State University, 1955; 1963.

Technology (School of Engineering and Technology)

- BARBAY, JOSEPH E., JR., Associate Professor, Ph.D., University of Missouri, Columbia, 1971; 1970.
 BESTERFIELD, DALE H., Associate Professor, Ph.D., Southern Illinois University, 1971; 1962.
 DUNNING, E. LEON, Professor and *Chairman*, Ph.D., University of Houston, 1967; 1957.
 JOHNSON, MARVIN E., Professor, Ed.D., University of Missouri, Columbia, 1959; 1948.
 KLOPP, MARK E., Associate Professor, M.S.Ed., Pennsylvania State University, 1954; 1956.
 MOELLER, C. MERRILL, Associate Professor, M.S.C.E., Kansas State University, 1951; 1956.

Theater (College of Communications and Fine Arts)

- CANNON, JOHN, Assistant Professor, M.F.A., Carnegie-Mellon University, 1968; 1973.
 MARSHALL, HERBERT, Professor, 1966.
 MCLEOD, ARCHIBALD, Professor, *Emeritus*, Ph.D., Cornell University, 1943; 1947.
 MOE, CHRISTIAN H., Professor, Ph.D., Cornell University, 1958; 1958.
 PAYNE, DARWIN R., Associate Professor and *Acting Chairman*, M.F.A., Southern Illinois University, 1955; 1963.
 PROCTOR, JOSEPH M., Assistant Professor, M.F.A., Brandeis University, 1971; 1976.
 REYNOLDS, HOWARD L., Assistant Professor, M.F.A., Smith College, 1969; 1975.
 STEWART-HARRISON, EELIN, Associate Professor, Ph.D., Louisiana State University, 1968; 1961.
 STRAUMANIS, ALFREDS, Associate Professor, Ph.D., Carnegie-Mellon University, 1966; 1973.
 TALAROWSKI, JOSEPH W., Professor, Ph.D., University of Denver, 1966; 1975.

Thermal and Environmental Engineering (School of Engineering and Technology)

- CHEN, JUH W., Professor and *Chairman*, Ph.D., University of Illinois, 1959; 1965.
 COOK, ECHOL E., Associate Professor, Ph.D., Oklahoma State University, 1970; 1971.
 HELMER, WAYNE A., Assistant Professor, Ph.D., Purdue University, 1974; 1974.
 HESKETH, HOWARD E., Professor, Ph.D., Pennsylvania State University, 1968; 1968.
 JEFFERSON, THOMAS B., Professor, Ph.D., Purdue University, 1955; 1969.
 KENT, ALBERT C., Associate Professor, Ph.D., Kansas State University, 1968; 1966.
 MUCHMORE, CHARLES B., Associate Professor, Ph.D., Southern Illinois University, 1970; 1966.
 O'BRIEN, WILLIAM S., Assistant Professor, Ph.D., West Virginia University, 1972; 1973.
 PETRIE, THOMAS W., Associate Professor, Ph.D., University of Minnesota, 1969; 1972.

RAJAN, SURYANARAYANIAH, Assistant Professor, Ph.D., University of Illinois, 1970; 1977.

SINHA, ATMESH K., Associate Professor, University of Sheffield, England, 1963; 1975.

STOEVEER, HERMAN J., Professor, *Emeritus*, University of Illinois, 1934; 1960.

Vocational Education Studies (College of Education)

ANDERSON, MARCIA, Assistant Professor, Ph.D., Southern Illinois University, 1975; 1970.

BAILEY, LARRY J., Professor, Ed.D., University of Illinois, 1968; 1969.

BAUERNFEIND, HARRY B., Professor, *Emeritus*, M.A.Ed., Northwestern University, 1943; 1951.

BITTLE, R. E., Professor, Ed.D., University of Florida, 1956; 1969.

BORTZ, RICHARD F., Associate Professor, Ph.D., University of Minnesota, 1967; 1967.

BUILA, THEODORE, Associate Professor, Ph.D., Cornell University, 1968; 1968.

CARTER, ROSE MARY, Assistant Professor, Ph.D., Purdue University, 1970; 1970.

ERICKSON, JOHN H., Professor, Ed.D., Pennsylvania State University, 1953; 1955.

FULTS, ANNA CAROL, Professor, Ph.D., Ohio State University, 1946; 1952.

GALLINGTON, RALPH O., Professor, *Emeritus*, Ed.D., George Washington University, 1947; 1955.

GOOCH, BILL G., Associate Professor, Ed.D., University of Tennessee, 1973; 1973.

HUCK, JOHN F., Assistant Professor, Ed.D., University of Illinois 1973; 1970.

JENKINS, JAMES, Professor, Ed.D., Pennsylvania State University, 1955; 1956.

KEENAN, DOROTHY, Professor, Ed.D., University of Illinois, 1962; 1961.

LEGACY, JAMES, Assistant Professor, Ph.D., Cornell University, 1976; 1977.

RAHE, HARVES C., Professor, Ed.D., Indiana University, 1950; 1950.

RAMP, WAYNE S., Professor, Ed.D., Bradley University, 1956; 1957.

ROSENBARGER, MAXINE, Associate Professor, Ph.D., Southern Illinois University, 1970; 1973.

STADT, RONALD W., Professor, Ed.D., University of Illinois, 1962; 1967.

STITT, THOMAS R., Professor, Ph.D., Ohio State University, 1967; 1967.

SULLIVAN, JAMES A., Professor and *Chairman*, Ed.D., West Virginia University, 1967; 1968.

WESTBERG, WILLIAM C., Professor, Ph.D., Pennsylvania State University, 1948; 1952.

WOOD, EUGENE S., Professor, Ed.D., University of Missouri, 1958; 1949.

Zoology (College of Science)

ANTHONEY, TERENCE R., Assistant Professor, M.D., University of Chicago, 1968; and Ph.D., University of Chicago, 1975; 1971.

BEATTY, JOSEPH A., Associate Professor, Ph.D., Harvard University, 1969; 1965.

BLACKWELDER, RICHARD E., Professor, *Emeritus*, Ph.D., Stanford University, 1934; 1958.

BRANDON, RONALD A., Professor, Ph.D., University of Illinois, 1962; 1963.

BURR, BROOKS M., Assistant Professor, Ph.D., University of Illinois, 1977; 1977.

DYER, WILLIAM G., Professor, Ph.D., Colorado State University, 1965; 1969.

ENGLERT, DUWAYNE C., Professor, Ph.D., Purdue University, 1964; 1963.

FISHER, HARVEY I., Professor, *Emeritus*, Ph.D., University of California at Berkeley, 1942; 1955.

GALBREATH, EDWIN C., Professor, Ph.D., University of Kansas, 1951; 1957.

GAROIAN, GEORGE, Associate Professor, Ph.D., University of Illinois, 1956; 1956.

GEORGE, WILLIAM G., Associate Professor, Ph.D., University of Arizona, 1961; 1964.

GERSBACHER, WILLARD, Professor, *Emeritus*, Ph.D., University of Illinois, 1932; 1936.

HARDIN, JAMES W., Assistant Professor, Ph.D., Southern Illinois University, 1974; 1974.

HEIDINGER, ROY C., Associate Professor, Ph.D., Southern Illinois University, 1970; 1970.

KLIMSTRA, WILLARD D., Professor, Ph.D., Iowa State University, 1949; 1949.

LeFEBVRE, EUGENE A., Associate Professor, Ph.D., University of Minnesota, 1962; 1966.

LEWIS, WILLIAM M., Professor and *Chairman*, Ph.D., Iowa State University, 1949; 1949.

MARTAN, JAN, Professor, Ph.D., University of Oregon, 1963; 1964.

McPHERSON, JOHN E., JR., Associate Professor, Ph.D., Michigan State University, 1968; 1969.

PAPARO, ANTHONY A., Associate Professor, Ph.D., Fordham University, 1969; 1973.

PETERSEN, BRUCE W., Assistant Professor, Ph.D., University of Colorado, 1968; 1968.

SHEPHERD, BENJAMIN A., Associate Professor, Ph.D., Kansas State University, 1970; 1969.

STAHL, JOHN B., Associate Professor, Ph.D., Indiana University, 1958; 1966.

STAINS, HOWARD J., Professor, Ph.D., University of Kansas, 1955; 1955.

STEIN, HILDA, Associate Professor, *Emerita*, M.S., University of Illinois, 1929; 1925.

WARING, GEORGE H., Associate Professor, Ph.D., Colorado State University, 1966; 1966.

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Objectives of Southern Illinois University

TO EXALT BEAUTY

*In God,
in nature, and
in art;
Teaching how to love the best
but to keep the human touch;*

TO ADVANCE LEARNING

*In all lines of truth
wherever they may lead,
Showing how to think,
rather than what to think,
Assisting the powers
of the mind
In their self-development;*

TO FORWARD IDEAS AND IDEALS

*In our democracy,
Inspiring respect for others
as for ourselves,
Ever promoting freedom
with responsibility;*

TO BECOME A CENTER OF ORDER AND LIGHT

*That knowledge may lead
to understanding
And understanding
to wisdom.*



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