

1974

1974-1975 Southern Illinois University Bulletin Carbondale Campus (Undergraduate Catalog)

Southern Illinois University Carbondale

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Southern Illinois University Bulletin

1974/1975
Graduate
Catalog
Carbondale



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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Southern Illinois University Bulletin

1974/1975
Graduate
Catalog
Carbondale



Southern Illinois University Bulletin

Volume 16, Number 5

June 1974

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This Issue...

of the *Southern Illinois University Bulletin* covers in detail questions concerning the Graduate School of Southern Illinois University at Carbondale. It supersedes Volume 15, Number 4.

The following issues of the *Southern Illinois University Bulletin* may be obtained free from University Graphics, Southern Illinois University at Carbondale, Carbondale, Illinois 62901.

Graduate Catalog

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

Undergraduate Catalog

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 (fall, 1974 through spring, 1975) is subject to the 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, 453-2357.

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University Calendar

Summer, 1974

Session Begins
Independence Day Holiday
Floating Holiday
Final Examinations

Commencement

Tuesday, June 18*
Thursday, July 4
Friday, July 5
Wednesday-Thursday,
August 7-8
Friday, August 9

Fall, 1974

New Student Days

Semester Begins
Labor Day Holiday
Thanksgiving Vacation

Final Examinations

Saturday-Monday,
August 24-26
Tuesday, August 27**
Monday, September 2
Tuesday, 10 p.m.-Monday, 8 a.m.,
November 26-December 2
Saturday-Saturday,
December 14-21

Spring, 1975

Semester Begins
Washington's Birthday Holiday
Spring Vacation

Final Examinations

Commencement

Monday, January 20*
Monday, February 17
Saturday, noon-Monday, 8 a.m.,
March 22-31
Saturday-Saturday,
May 10-17
Saturday, May 17

Summer, 1975

Session Begins
Independence Day Holiday
Final Examinations

Commencement

Monday, June 16*
Friday, July 4
Wednesday-Thursday
August 6-7
Friday, August 8

*Classes begin with the 8 a.m. classes this date

**Classes begin with the evening classes starting after 5:30 p.m.

Board of Trustees of Southern Illinois University

	<i>Term Expires</i>
Ivan A. Elliott, Jr., <i>Chairman</i> , Carmi	1979
Harold R. Fischer, <i>Vice-Chairman</i> , Granite City	1975
Harris Rowe, <i>Secretary</i> , Jacksonville	1977
William W. Allen, Bloomington	1975
Margaret Blackshere, Madison	1979
Donald L. Hastings, Jr., Edwardsville	June 30, 1974
Willis Moore, Carbondale	1977
Richard A. Haney (<i>Ex-officio</i>), Mt. Vernon	
James M. Brown, Chief of Board Staff	

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J. K. Leasure, *Vice President for Academic Affairs and Provost*
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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.

Facilities and Services

Morris Library

Morris Library contains over 1,700,000 volumes and subscribes to more than 10,000 periodicals. Over 100,000 volumes have been added to the collection in each of the last three years. In addition to books and journals, the library has extensive collections of maps, manuscripts, and films. 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 is available for consultation. The extensive scientific journal collection of the Argonne National Laboratory is also available to graduate students in person or on interlibrary loan.

Information Processing

The Information Processing unit supports both the academic and the administrative needs of the University. The research activities of both faculty and students, as well as instructional activities, are supported through the Academic Computing Services section of Information Processing. The major hardware component of the center is an IBM S/370, Model 158 computer. A special facility of the center is an instruction-

al 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.

Major areas of service supported by the center include, but are not limited to, maintenance of a large program library, consulting about computer-related problems, and periodic non-credit instruction in computing.

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 two terms prior to graduation. Alumni should periodically up date 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. If a sufficient number of graduate students apply they will be housed on the same floor rather than mixed in with undergraduate students. Single rooms are available for 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 early from University Housing, Building D, Washington Square.

Off-Campus Housing. The Housing Information Center, Building C, 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 \$30 a month for trailer spaces to \$200 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 house facility.

Health Services

The Health Service, 115 Small Group Housing, provides medical care to students, including 24-hour emergency service, through payment of the medical benefits fee. The Health Service offers x-ray, laboratory, pharmacy, infirmary, and physician services. Hours of service are 8 a.m. to 6 p.m. Monday through Friday and 8:30 a.m. to 1 p.m. on Saturday.

For emergency care when the Health Service is not open, students should go to Doctors Memorial Hospital emergency room. Any time an ambulance is required, a student may call 453-3000, the SIU emergency vehicle number.

The Minor Care Clinic provides medical advice and treats sore throats, colds, flu, cuts, poison ivy, and abrasions without an appointment. The clinic is open from 8:30 a.m. to 4:30 p.m. Monday through Friday.

Financial Assistance

Application forms for fellowships and special doctoral assistantships are available from the Graduate School. The student should apply for these awards through the

chairman of his major department who recommends to the Graduate School candidates from his department for such awards. Two competitions are held.

If a student is to be considered for the first round of competition, his application for the award should be received by the chairman early in January preceding the year for which the award is desired, in order that the student's application (including submission of all official transcripts) may be in the Graduate School by February 1. It is the student's responsibility to be certain all material is complete and in the Graduate School by this date.

Graduate student appointments are available in a number of departments and from research agencies. For these appointments the student applies direct to his department chairman.

Graduate fellowships, special doctoral assistantships, special fellowships, and graduate student appointments include remission of tuition, but fees must be paid.

A student may receive no more than five academic terms, including summer sessions, of graduate-student support while a master's level student. A student may receive no more than eight academic terms, including summer sessions, of graduate-student support while a doctoral-level student. These time limits apply to both assistantship appointments and fellowship awards or any combination of the two.

A student who is awarded a fellowship or graduate student appointment but who has not furnished official proof of his degree to the Graduate School shall be considered to be on term appointment for one semester only. He will not be appointed to a second term until an official transcript indicating receipt of his degree is received in the Graduate School.

Graduate Fellowships

Graduate fellowships are available in all areas of graduate study and are awarded by the Graduate School on the basis of scholarship. The award is normally made for 12 consecutive months. For master's degree students the stipend is \$280 per month, or \$3,360 for the year; for doctoral degree students the stipend is \$300 per month, or \$3,600 for the year. There is no service requirement other than the duties required by the department of all students regardless of their source of support.

While on a fellowship a student shall not hold another appointment in the University, nor shall he hold a job outside the University, since the purpose of the fellowships is to provide a student with a source of income which will enable him to work full time at his studies rather than work part time at a job and part time at his studies.

Special Doctoral Assistantships

Special doctoral assistantships are available for students who hold the master's degree, or its equivalent, from another institution, and who have been admitted to one of the doctoral programs. Awards are made by the Graduate School on the basis of scholarship. The award is normally made for 12 consecutive months and carries a stipend of \$345 per month, or \$4,140 per year. Extension to an additional 12 months is possible upon recommendation of the department chairman. There is a service requirement, with the specific duties to be assigned by the chairman of the department.

Special Fellowships

Several special 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 stu-

dents 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.

Stipend rates 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.

Graduate Student Appointments

Graduate student appointments pay stipends of at least \$280 per month for master's students for half-time duties. Stipends increase at the Ph.D. level and when a student is admitted to Ph.D. candidacy. Service of 20 hours per week, or corresponding load in teaching, is required.

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), but additional semesters may be available if the student applies.

To be eligible the student must be admitted to the Graduate School and to a department, and he may not hold another University appointment which entitles him to 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, Washington Square B. Completed applications are forwarded to the Graduate School for recommendations and returned to the 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 this office include part-time employment on and off campus, cooperative work-study programs, summer employment, and student loan funds.

Celia M. Howard Fellowship

The Illinois Federation of Business and Professional Women's Clubs, Inc. annually awards to a mature Illinois woman college graduate a Celia M. Howard fellowship toward a Master of Science degree in administration of justice. For information regarding this fellowship, write to Mrs. Rosemary Hardwick, Celia M. Howard Fellowship Fund Committee, 115 North Sixth Street, Carrollton, Illinois 62016.

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 department chairmen 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) in which he is 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 in which he is a student. Such a term appointment shall not be renewable beyond a period of one year.

Tuition and Fees

Tuition and fees charged students are established by the Board of Trustees and are subject to change whenever conditions necessitate. All assessments are on a per-hour basis, with 12 hours considered full time. Students will be assessed the following tuition and fees each term:

Semester Hours Enrolled	TUITION		STUDENT FEE SCHEDULE ¹		
	(Illinois Resident)	(Non- Resident)	On-Campus ²	Extension and Residence-Centers ³	Permanent Full-Time or Permanent Part-Time Employee ⁴
1	\$ 18.00	\$ 54.00	\$48.25	\$16.00	\$ 7.50
2	36.00	108.00	50.00	17.75	7.50
3	54.00	162.00	52.50	20.25	8.25
4	72.00	216.00	55.00	22.75	9.00
5	90.00	270.00	57.50	25.25	9.75
6	108.00	324.00	60.00	27.75	10.50
7	126.00	378.00	62.50	30.25	11.25
8	144.00	432.00	65.00	32.75	12.00
9	162.00	486.00	67.50	35.25	12.75
10	180.00	540.00	70.00	37.75	13.50
11	198.00	594.00	72.50	40.25	14.25
12 +	214.00	642.00	75.00	42.75	15.00

¹No waiver is authorized.
²A student will pay the full Student Medical Benefit Fee of \$17.25, which will entitle him to full medical benefits at the Health Service. An on-campus student may seek a refund of the Student Medical Benefit Fee within the first four weeks of each semester by contacting the administrative director of the Health Service. The Student Medical Benefit Fee is not charged for instruction offered off campus. Faculty, administrative staff, and civil service personnel are not permitted to pay the Student Medical Benefit Fee. The on-campus student fee includes allocations to the Student Medical Benefit Fee, Student Welfare and Recreation Fund, Athletic Fund Fee, Student Center Fee, and Student Activity Fee.
³Includes allocations to the Student Welfare and Recreation Fund, Athletic Fund Fee, Student Center Fee, and Student Activity Fee.
⁴Includes Student Center Fee only. A civil service employee claiming this tuition and fee remission must receive approval of his department head and director of the Personnel Office prior to enrolling for courses.

A student may incur additional charges for field trips, library fines, and excess breakage. A student taking a course requiring materials, as distinct from equipment, will ordinarily pay for such materials.
At the time of graduation, each student will be charged a graduation fee of \$9; and in addition each doctoral candidate will be charged a dissertation microfilming fee of \$25-\$40, depending upon the service selected.

Graduate Appointees—Tuition Waiver

A graduate student who holds a graduate-student 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, he 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 such an appointment, requiring service to the University of at least 25 per cent of full time, for 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 appointments normally awarded for 12 or more consecutive months (i.e., Special Doctoral Assistantships, Graduate or Special Fellowships). NDEA (Title IV) fellows, NSF trainees, and NSF fellows are not eligible.

NDEA, NSF

NDEA (Title IV) fellows and NSF trainees do not pay fees, tuition.

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.

Residency Determination

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 student is classified in error as a resident student, the change in tuition shall be applicable beginning with the term following the reclassification; if the student is classified in error 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.

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 twelve 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 a court decree or order, that of the father unless the person has continuously resided with the mother for a period of at least twelve consecutive months immediately preceding his registration at the University, in which latter event his residence shall be considered to be that of his mother; 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 with whom the person has resided and by whom he has been supported for a period of at least twelve consecutive months immediately preceding his registration at the University for any term if the person's parents are dead or have abandoned him and if no legal guardian of the person has been appointed and qualified.

Parent or Guardian

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

Emancipated Minor

If a minor has been emancipated, is completely self-supporting, and actually resides in the State, he shall be considered to be a resident even though his parents or guardian may reside outside the State. An emancipated minor who is completely self-supporting shall be considered to actually reside in the State of Illinois if he has maintained a dwelling place within the State uninterruptedly for a period of at least twelve 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.

Persons Without United States Citizenship

A person who is not a citizen of the United States of America, to be considered a resident, must have permanent resident status with the United States Immigration and Naturalization Service and must also meet and comply with all of the other applicable requirements of these regulations to establish resident status.

Armed Forces Personnel

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

Minor Children of Parents Transferred Outside the United States

The minor children of persons who have resided in the State for at least twelve 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.

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.

Voter registration, filing of taxes, proper license and registration for the driving or ownership of a vehicle, and other such transactions may verify intent of residency in a state. Neither length of University attendance nor continued presence in the University community during vacation period shall be construed to be proof of Illinois residence.

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 10 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.

These regulations shall become effective for the winter quarter, 1972, and shall remain in full force and effect unless and until subsequently amended or repealed by action of the Board of Trustees.

Graduate Degrees Offered

Master's degrees are available in the major fields 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	Instructional Materials	MS in Ed
Agricultural Industries	MS	Inter-American Studies	MA
Animal Industries	MS	Journalism	MA, MS
Anthropology	MA	Linguistics	MA
Art	MFA	Mathematics	MA, MS
Biological Sciences	MS	Microbiology	MA
Botany	MA, MS	Music	MM, MMed
Business Administration	MBA	Occupational Education	MS, MS in Ed
Business Education	MS in Ed	Philosophy	MA
Chemistry	MS	Physical Education	MS in Ed
Community Development	MS	Physics	MA, MS
Computer Science	MS	Physiology	MS
Early Childhood Education	MS in Ed	Plant and Soil Science	MS
Economics	MA, MS	Political Science	MA
Educational Administration	MS in Ed	Psychology	MA, MS
Elementary Education	MS in Ed	Public Affairs	MPA
Engineering	MS	Public Visual Communications	MA
Engineering Biophysics	MS	Recreation	MS in Ed
English	MA	Rehabilitation Institute	
English as a Foreign Language	MA	Behavior Modification	MA, MS
Foreign Languages		Rehabilitation	
and Literatures	MA	Administration	MA, MS
Forestry	MS	Rehabilitation	
Geography	MA, MS	Counseling	MA, MS
Geology	MS	Secondary Education	MS in Ed
Guidance and Educational		Sociology	MA, MS
Psychology	MS in Ed	Special Education	MS in Ed
Health Education	MS in Ed	Speech	MA, MS
Higher Education	MS in Ed	Speech Pathology and	
History	MA	Audiology	MS
Home Economics	MS	Theater	MA, MFA
Home Economics Education	MS in Ed	Zoology	MA, MS

Specialist degree programs are available in the fields listed below.

Educational Administration	Secondary Education
Elementary Education	Special Education
Guidance and Educational Psychology	

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

Anthropology	Education	Journalism
Botany	English	Mathematics
Chemistry	Geography	Microbiology
Economics	Historical Studies	Molecular Science

Philosophy
Physiology
Political Science

Psychology
Sociology
Speech/Theater

Speech Pathology and
Audiology
Zoology

Admission to Graduate Study

A student should obtain application forms from the Graduate School and submit application, with other supporting material, directly to the Graduate School where it will be evaluated for compliance with Graduate School admission requirements. The student must have the registrar of each college previously attended (except Southern Illinois University at Carbondale) send three official transcripts of his record to the Graduate School. Copies sent to a department are not acceptable. Unofficial or personal transcripts 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 department* in which the student indicates his desired major.

The admission requirements of the Graduate School and the department must both be met before the student is admitted either conditionally or unconditionally, and both the Graduate School and the department may specify conditions. Several departments require additional materials such as test scores or letters of recommendation. The student will be informed of his admission status after this process has been completed. Admission to the Graduate School is determined almost entirely by the caliber of the applicant's previous college work.

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 he is seeking admission. An applicant to a degree program whose materials are received too late for processing may be granted unclassified (late entry) admission 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 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.

A student who does not enroll in courses for the initial term for which he has been admitted will be required to file a new application in the Graduate School at least 30 days in advance of the term for which he wishes to register. (The new application is to ensure that the Graduate School has current information on the student and to permit his name to be re-entered on the computerized file of students.) He should also re-apply to his major department.

If the term for which he is applying is more than two years after the term for which he was first admitted, he must have the Registrar of all institutions previously attended furnish three official copies of all academic work to the Graduate School. If he has taken any course work at another institution between his first admission and his first registration, he must furnish three official transcripts of this work regardless of the amount of time elapsed.

An applicant to master's level study may be considered for admission to the Graduate School when: (1) in order to complete all requirements for the bachelor's

*The word "department" is used here to designate any academic or administrative unit offering work leading to one or more graduate degrees.

degree he needs no more than 48 quarter hours (if his school is on a quarter system) or 32 semester hours (if his school is on a semester system) beyond the credits shown on his transcript at the time of application; and (2) he has an overall grade point average of at least 3.5 (where $A=5.0$) in the work shown on his transcript at the time of application.

In all cases, admission to the Graduate School is final only when an official transcript is received in the Graduate School, certifying that the applicant has been awarded a bachelor's degree with the required minimum grade point average.

An applicant for Ph.D.-level study may be considered for admission to the Graduate School when: (1) in order to complete all requirements for the master's degree he needs no more than 24 additional quarter hours (if his school is on the quarter system) or 16 additional semester hours (if his school is on the semester system) beyond the credits shown on his transcript at the time of application; and (2) he has an overall grade point average in graduate work of at least 4.25.

In all cases, admission to the Graduate School is final only when an official transcript is received in the Graduate School, certifying that the applicant has been awarded a master's degree and has a minimum grade point average of 4.25 for all graduate work.

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 record at Southern Illinois University at Carbondale, subject to general limitations of Graduate School regulations, to on-campus credit and residency requirements for master's degree and doctor of philosophy degree programs, respectively, and to acceptance by the student's major department. All transfer credits are subject to final review by the graduate dean.

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 thesis, required research paper, or doctoral dissertation. 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.

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 he holds his appointment. If a faculty member has been admitted to a graduate degree program in some unit other than the one in which he holds his appointment, no member of the faculty of the unit in which the appointment is held may be a member of his thesis committee, graduate program committee, dissertation committee, or any other examining committee.

Admission to Graduate Study on an Unclassified Basis

A person may apply for admission to the Graduate School as an unclassified student when he does not seek a graduate degree or certificate, or when he has applied too late to be admitted to a degree program for the term for which he seeks admission. A person who seeks admission as an unclassified graduate student must present

evidence that he holds a bachelor's degree and that his overall undergraduate grade point average is 3.40 or higher ($A=5.00$).

Admission of International Students

A student from abroad is subject to all requirements for admission established by the Graduate School. In addition, he 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 Assistant Director of Admissions, International Student Division, Office of Admissions and Records, Southern Illinois University, Carbondale, Illinois 62901.

All foreign-born applicants must apply through the foreign admissions office unless they are certified as residents by the Office of Admissions and Records.

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

An international student must be enrolled in a program leading to a graduate degree. He cannot be admitted as an unclassified student.

If the above requirements are satisfactorily met and the student is admitted to a degree program, he will be required to certify that he has adequate financial resources available to him 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 Teaching Assistantship. Every international student assigned a teaching assistantship must pass an oral examination conducted by the Center for English as a Second Language before he undertakes 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, the applicant must have an academic record equivalent to a 3.70 grade average ($A=5.00$) for admission to a graduate degree program.

The determination of the applicant's grade point average shall be the responsibility of the Office of Admissions and Records, International Student Division.

Retention

A student admitted conditionally because of low grades is on academic probation from the time of admission. A student who was admitted without any condition because of low grades (that is, a master's level student whose overall undergraduate GPA was 3.70 or above, or a specialist- or Ph.D.-level student whose GPA in all

previous graduate work was at least 4.25), and who has earned eight or more semester hours of credit in 400- or 500-level courses, will be placed on academic probation when his cumulative GPA for all graduate course work falls below 4.00. All 400- and 500-level courses taken by a graduate student count in his overall graduate GPA, even though some courses may not be a part of his degree program.

A student who is currently on academic probation and has been on academic probation for at least one academic term (semester or summer session of at least eight weeks), and who has earned at least 15 semester hours of credit in graduate courses, will be suspended from the Graduate School if he has received six or more hours of *C* in graduate courses which are not balanced by hours of *A* in graduate courses, or in any case in which it would take at least six additional hours of *A* work to bring his graduate grade point average up to 4.00.

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.

Undergraduate Student Registration in Graduate Courses

Graduate Credit

An undergraduate student who wishes to register for a graduate course (any 400- or 500-level course) for graduate credit must file the standard application for admission to the Graduate School. If he is accepted to the Graduate School, he will not be allowed to register for graduate courses for graduate credit until he is within 12 semester hours of receipt of the bachelor's degree. At that time his registration will be permitted, subject to all of the approval procedures in effect for graduate students who have already received the bachelor's degree, together with final approval by the Graduate School.

After having received such approvals an undergraduate student will be allowed to take graduate courses for graduate credit for one semester or one summer term. If, at the end of the term, he has not received the bachelor's degree, his permission to enroll in graduate courses for graduate credit will be withdrawn until after he has received the bachelor's degree.

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 chairman 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 the special reasons why the particular student should be allowed 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. There should also be an explanation of why the student's needs cannot be adequately satisfied by undergraduate courses. Any information that explains the unique features of this particular student's case and justifies special approval will be helpful. 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.

Master's Degree Program

Admission

In order to receive unconditional admission to the Graduate School for study at the master's level, the applicant must hold a bachelor's degree and have an overall undergraduate grade point average of 3.70 or higher ($A=5.00$).

A student with a grade point average between 3.40 and 3.70 may be granted conditional admission and will remain on conditional status until he earns 15 semester hours of credit in graduate-level courses. The faculty of a degree program unit may add its own grade point average requirements and other conditions for admission to that particular program. A student who is denied admission to a degree program because of low grades may enroll as an unclassified student. If, at a later date, he is admitted to a degree program, none of the credit hours acquired as an unclassified student may be counted toward his degree.

A student whose overall undergraduate grade point average is below 3.40 may be admitted to the Graduate School only by special permission of the graduate dean. A student who wishes to request such permission must write a letter formally requesting that an exception to the grade point average rule be made in his case, stating his reasons for believing that special consideration is warranted in his case, and particularly stating whether there is some reason to believe that his previous academic record is not a valid indicator of his success in Graduate School because of his membership in a minority group, his low socioeconomic status, or his sex.

In addition, this letter should indicate when he expects the following information to have been received in the Graduate School office: (1) scores on the aptitude test of the Graduate Record Examination (GRE) or on other standard tests such as the Miller Analogies Test; (2) at least three letters of recommendation on his behalf from persons who are professionally qualified to judge his promise as a graduate student in his proposed specialty; (3) a very strong letter of support from the degree program to which he wishes to apply.

If a student has requested special permission for an exception to the grade point average rule, the Graduate School office will calculate his grade point average for his last two years of undergraduate work and for his undergraduate major; at least one of these grade point averages should be above 3.70. If the graduate dean approves admission to the Graduate School for a student whose grade point average is less than 3.40, the student must still obtain admission to a graduate degree program, since he will not be permitted to register as an unclassified student.

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. An overall grade point average of at least 4.00 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 15 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 his major program in chapter 2 for specific requirements in his area.

On-Campus Credit

The student must earn at least half of the credit applied towards his master's degree in courses at Southern Illinois University at Carbondale, or he must have been in residence as a full-time student at the University for at least one semester or two summer sessions of at least eight weeks each.

This requirement may be fulfilled by registration for the specified period in (a) regularly scheduled courses held on campus; (b) courses held on campus at other times than the regular scheduling periods and approved on an ad hoc basis for graduate credit; (c) all courses offered off campus at a University-approved residence center as part of a residence-credit degree program approved by the graduate dean; (d) courses taken off campus which are not part of a residence-credit degree program but which have been approved on an ad hoc basis by the graduate dean for residence credit.

During the period of on-campus study, the student should not be employed more than half-time, either by the University or by an outside employer or by a combination of both.

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 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. At the time that the department submits a clearance for the student to graduate, the director of the thesis must submit grade change cards to change the grade in the thesis course from Deferred to Satisfactory or Unsatisfactory. 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.

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.

Application forms for graduation, which are to be secured from the Office of Admissions and Records should be completed and returned to that office after payment of the graduation fee at the Bursar's Office, at least six weeks prior to the graduation date.

Double Major for a Master's Degree

A student may earn a double major in a master's degree under the following conditions: (1) He must have been admitted to one master's degree program. (2) Each unit

in which he 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 course work for each major must be in courses numbered 500 or above. (7) The minimum number of hours required for the double major must total 60 per cent of the sum of the total required for the two majors individually.

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 his 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 concerning residency, the total number of hours, and the number of hours at the 500 level shall apply to the second master's degree exactly as they would if this were a first master's degree.

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. He 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, secondary education, and special 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 4.25 ($A=5.00$) 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.

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 4.25. The student's work must be planned early by the student and his advisory committee and must clearly lead him toward the specialization he seeks. 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 4.25, 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 course work 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 himself for this examination through independent study and course work, as advised by the faculty of his Ph.D. program. The examination is given to determine the breadth and depth of the student's knowledge within his 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 he has 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.

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 passed his preliminary examination and met the research tool requirement of the program. The Ph.D. degree may not be conferred less than six months, nor more than five years, after admission to candidacy, except upon approval of the dean of the Graduate School. 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 he 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 faculty members, at least one of whom shall be from a graduate program outside the student's academic unit.

While the student is working on his dissertation he 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; he will register for 24 semester hours of dissertation credit, for example, 12 hours for each of two terms. At the time that the department submits a statement of approval for the student to receive his degree, the chairman of the student's dissertation committee must submit grade change cards to record the final grade which the student has received for his dissertation credits.

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 \$25.00 to cover the cost of publication of the abstract and microfilming of the dissertation. If copyright is desired, an additional fee of \$15.00 will be required.

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 his dissertation and his performance at the final oral examination to be satisfactory.

Residency

The residency requirement for the Ph.D. must be fulfilled after admission to the Ph.D. program but before formal admission to Ph.D. candidacy. The residency requirement may be met in either of two ways, at the option of the student contingent upon approval of the administrative officers of his degree program:

Option 1. The residency requirement may be satisfied by enrollment as a full-time Ph.D. student on campus for two consecutive semesters (three consecutive quarters).

During the period of residency the student may not be employed more than half-time by an outside employer, the university, or both.

Option 2. The residency requirement may be satisfied by earning over a period not to exceed four calendar years at least 24 semester hours (36 quarter hours) of graduate credit as a Ph.D. student on the Carbondale campus under the following conditions:

1. The student must complete during each term of residence at least one substantive graduate course or seminar, other than individual study, individual research, readings, practicum, internship, or dissertation.
2. He must earn a total of at least three semester hours during each term of residency. A maximum of six semester hours of graduate credit will be counted toward the residency requirement each term.
3. A student who is to be employed more than half time must submit through appropriate channels to the Graduate Dean in advance of the terms for which he is to be registered for residence credit while thus employed, an analysis of the duties of his employment showing their relevance to his doctoral studies.

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, he 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 sponsorship by a unit with an approved Ph.D. program shall be submitted to the dean of the Graduate School. Upon his 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.

Advisement

Each student admitted to a degree program must consult a graduate adviser in his major department before coming to the Graduate School office for registration. This adviser will assist the student in planning his total program and in choosing courses each term.

Unclassified nondegree students begin registration immediately at the Graduate School office.

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 student's responsibility to see that his records in the Graduate School office, in the Office of Admissions and Records, and with his major adviser 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

Registration takes place in the Graduate School office. 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.

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. Program-change forms may be obtained from the Graduate School office.

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

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 he 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 he 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 he 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 residence 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 admitted on a regular basis (either in a degree program or unclassified) to the Graduate School at Southern Illinois University at Carbondale. All classes offered will be listed in the appropriate Schedule of Classes and will meet for the same total numbers of hours per credit hour as is usual for corresponding classes meeting on campus.

For information about specific programs and courses, the student should consult the appropriate department in chapters 2 and 3.

Student Course Loads

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

The maximum load for teaching, research, and graduate student appointees who are employed half time is 12 hours and the minimum is six hours. Special doctoral assistants are considered half-time appointees. For appointees employed one-quarter time, the maximum is 14 hours and the minimum is six hours. For students appointed more than half time, the maximum is eight hours and the minimum is three hours.

For persons attending the eight-week summer session, the maximum is 12 hours. Graduate fellows must take a minimum of 10 hours per semester; NDEA (Title IV) fellows and NSF trainees are required to register for 11 to 16 hours per semester.

Exceptions to these maxima and minima are possible only with the written permission of the Graduate Dean.

Graduate Advisers

Following is a list of chief academic advisers to students pursuing a graduate degree.

Administration of Justice— Vernon E. Rich	Botany—William Ashby
Agricultural Industries— Eugene Wood	Business Administration— Gola E. Waters
Animal Industries— Harold H. Hodson Jr.	Business Education— Harves Rahe
Anthropology— Milton Altschuler	Chemistry and Biochemistry— James Tyrrell
Art—Michael Onken	Computer Science—A. M. Mark
Art Education— Roy Abrahamson	Early Childhood Education— Nancy Quisenberry
Behavior Modification— Roger L. Poppen	Economics—Robert Ellis
Biological Sciences— Edwin Galbreath	Education (Ph.D Program)— Donald L. Beggs
	Educational Administration and Foundations—Edward Sassee

Elementary Education—
 Donald Paige
 Engineering
 Electrical and Systems
 Engineering—J. G. Smith
 Engineering Mechanics
 and Materials—P. K. Davis
 Thermal and Environmental
 Engineering—Juh-Wah Chen
 Engineering Biophysics—
 Harold M. Kaplan
 English—Howard Schultz
 English as a Foreign Language—
 Patricia Carrell
 Forestry—Ali A. Moslemi
 French—Marie-Jose Southworth
 Geography—Douglas Carter
 Geology—Russell Dutcher
 German—Hellmut Hartwig
 Guidance and Educational
 Psychology—John T. Mouw
 Health Education—
 Donald Boydston
 Higher Education—
 Jack W. Graham, John Hawley,
 Roland Keene, Donald Tolle
 History—Howard W. Allen
 Home Economics
 Child and Family—
 Michael Zurich
 Clothing and Textiles—
 Shirley Friend
 Family Economics and
 Management—Karen E. Craig
 Food and Nutrition—
 Frank Konishi
 Home Economics Education—
 Anna Carol Fults
 Instructional Materials—
 Gordon Butts
 Inter-American Studies—
 David P. Werlich
 Journalism—George C. Brown
 Linguistics—Patricia Carrell
 Mathematics—Carl E. Langenhop

Microbiology—John Caster
 Molecular Science—
 John Zimmerman
 Music—Roderick Gordon
 Occupational Education—
 John H. Erickson
 Philosophy—Lewis E. Hahn
 Physical Education (Men)—
 Edward J. Shea
 Physical Education (Women)—
 JoAnne Thorpe
 Physics—Chuen-Chuen
 Chang-Fang
 Physiology—
 Ralph Stacy
 Plant and Soil Science—
 Gerald Coorts
 Political Science—
 William S. Hardenbergh
 Psychology—David Ehrenfreund,
 Janet Rafferty
 Public Affairs—
 Randall H. Nelson
 Public Visual Communications—
 Richard M. Blumenberg
 Thomas O. Olson
 Recreation—
 Loren Taylor
 Rehabilitation Administration—
 Robert E. Lee
 Rehabilitation Counseling—
 Brockman Shumacher
 Russian—Joseph Kupcek
 Secondary Education—
 Arthur Aikman, R. J. Fligor
 Sociology—Peter Munch
 Spanish—Warren Meinhardt
 Special Education—
 Howard Morgan, Kristen Juul,
 Wyatt Stephens, James Teska
 Speech—Thomas Pace
 Speech Pathology and
 Audiology—John Moncur
 Theater—Eelin Stewart-Harrison
 Zoology—W. D. Klimstra

Grading System

Grades are recorded by the letters *A*, *B*, *C*, *D*, and *E* (*A*=5.00). *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 instructor, but not to exceed one year from the close of the semester in which course was taken. If *Inc.* remains, it is not included in grade point computation. To complete the work, a student should not register for the course again but should complete the work from the original registration.
- DEF**—Deferred. Used only for graduate courses of an individual, continuing nature such as thesis or research. When the work is completed, grade is changed to a letter grade.
- ABS**—Unauthorized withdrawal. Used when student fails to continue in attendance, 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 he pays the same fees as though he were 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 his 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 letter grade will be given 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.

2 Academic Programs

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

Programs are listed below in order of their appearance on the following pages.

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

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 is a multidisciplinary study of crime and social control by the agencies of criminal justice. Through merger of theoretical orientations and practical experience, students are prepared for careers in law enforcement, court administration and auxiliary services, correctional institutions, community-based programs, teaching in criminal justice degree programs, and criminal justice planning agencies. Augmenting the academic program, a research unit provides opportunity for graduate students and faculty members to

conduct research related to the administration of justice and to develop projects designed to implement innovation in the agencies comprising criminal justice.

Unconditional admission requires a 3.7 overall undergraduate average and acceptance by the faculty. Scores from the Graduate Record Examination (aptitude portion only) are also required.

Requirements

Graduation requires the writing and defense of a thesis and an internship. The 36 semester hours of instruction include a core of two of the following courses: AJ 501, AJ 502, and AJ 503. In addition, a career or advanced graduate studies oriented concentration of 12 semester hours is selected by the student and his adviser. Nine elective hours from the administration of justice are then chosen to support the student's concentration or to develop supportive competencies such as research, management, law, rehabilitation, etc. Courses may be selected from outside the major department where needed.

The program is designed to provide the student, his adviser and his program committee maximum flexibility in developing an individualized multidisciplinary program of study relevant to the student's academic and career objectives.

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 processing by the Graduate School.

The center also supports joint graduate programs for students oriented primarily into the Departments of Political Science, Psychology, and Sociology. Inquiries may be addressed to the chairman of the Center for the Study of Crime, Delinquency and Corrections, Academic Affairs.

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.

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 3.7 is required. Students may be accepted on a conditional basis if the GPA is below 3.7.

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, agricultural marketing, agricultural prices, agricultural policy, resource economics, and agri-business management.

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. Eight hours must be agricultural economics courses, six hours economics courses, and six hours statistics or accounting courses. M.S. students usually take 4-6 hours of research or thesis and complete the additional hours by taking courses in agricultural economics or in their area of specialization in the College of Business and Administration.

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.

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 12 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, 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. Twelve 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

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 concentra-

tion 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 animal behavior, 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 involving a thesis are: a) meet animal industries undergraduate requirements; b) minimal GPA of 3.7 ($A=5.0$).

Students who do not meet the undergraduate requirements may correct these deficiencies while an unclassified student or may select the non-thesis option. In addition to completing the 20 hours of departmental graduate credit, these students will be required to complete at least 7 semester hours of undergraduate course work in animal industries which will not apply to minimum requirements for the degree. Students entering the animal industries graduate program with a GPA below 3.70 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 4.0 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, meat science, 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 or Doctor of Philosophy degree in anthropology. Acceptance for graduate study in anthropology and subsequent continuation in the graduate program are at the discretion of the Department of Anthropology, provided that the student has been admitted to the Graduate School and meets the retention requirements of the Graduate School.

Application forms for admission to the Graduate School may be obtained from the Graduate School. In addition to the materials required by the Graduate School, the student must send three letters of recommendation and a personal statement of aims and interests addressed to the chairman of the department.

Although Graduate Record Examination scores are not required by the department, the student is invited to include these scores with other data supplementing his application papers. The student is advised, however, that inclusion of such scores may be required as a part of a future application for non-university grants or fellowships.

No special program of previous work is required. Applicants with academic degrees in fields other than anthropology are accepted. However, in consultation with the department, a plan for remedying undergraduate deficiencies in anthropology will be arranged.

In some cases the department may petition the graduate dean for permission for the student to be admitted to Ph.D. level study without formal receipt of the master's degree on the basis that his graduate work is equivalent to a master's degree.

The student coming to Southern Illinois University at Carbondale for either the M.A. degree or the Ph.D. degree will be given a choice between alternatives A or B noted below. Inasmuch as these involve anthropology, they will include the traditional major sub-fields which, as staff is available, will be archaeology, cultural anthropology, social anthropology, linguistics, and physical anthropology.

(A) Concentration in a major sub-field of anthropology with sufficient work in the other sub-fields to allow the student a general understanding of their coverage, method, and theory.

Students in program A will be expected and encouraged to go outside the discipline of anthropology as it is formally structured today. A student taking the social anthropology concentration, for example, might do work in one or more sub-fields of sociology, psychology or social psychology, or in applied fields such as community development. A culture historian might be involved in geology, cultural or physical geography, botany, zoology, history, or paleontology. A linguist might have a similar range of outside fields depending on the needs of the individual student.

(B) A degree in which two or even three basic anthropological sub-fields can be merged.

For example, a student might wish to combine social anthropology and linguistics or archaeology and social anthropology. In such a case an internalized program could be worked out. Outside fields may be included in this alternative, though they will be less heavily stressed than the anthropological ones.

In all cases the student in either category A or B will be expected to have at least two subject fields, one of which must be within anthropology. All students in either the M.A. or Ph.D. programs will be required to have a reading knowledge of a major literary language foreign to the student. In addition, all graduate students in anthropology are required to have formal experience in teaching.

The Program

A student coming into the Department of Anthropology is expected to take a well-rounded curriculum in anthropology during his first year, the actual coursework being determined by his background in anthropology, assistantship duties, etc. A student must have a minimum of eight graduate level courses over a 4 semester period, including at least one graduate credit course or seminar in each of the major sub-fields of anthropology for which staff is available.

Midway in the second semester of his/her first year in graduate school, the student will take a written diagnostic examination. The first part of this examination will consist of six hours; one and a half hours for each of the subjects of linguistics, social and cultural anthropology, archaeology, and physical anthropology. In the second part of the examination, the student will be given a selection of data (for example, a journal article) to take home for a period of 72 hours. He/She will be asked to turn in a concise analysis and comment on these data. The purpose of the examination is not to test knowledge of anthropological data but rather to test a student's ability to manipulate abstract concepts and to express concepts clearly in writing. All members of the faculty in residence will read the two parts of the examination which will be considered as a unit and voted on as a whole. Grades will be pass or fail. A simple majority vote will pass or fail, and students who fail will be dropped from the program. Under no circumstances shall any student repeat the diagnostic examination.

At the end of the academic year students who successfully pass the diagnostic examination will have their academic record evaluated by the executive committee of the department. The executive committee, after consultation with other members of the department, will direct the student to make up any subject deficiencies by recommending specific course work. The executive committee, after consultation with the faculty, will also decide at this time whether the student is to go into an M.A. or a Ph.D. program.

Master's Degree Program

Students accepted for the master's program will request a committee chairman who shall be a continuing member of the Department of Anthropology. A second faculty member, who may be from outside the department, will be chosen by the student and his chairman in consultation with the departmental chairman or director of graduate studies.

In order to meet the requirements for the Master of Arts degree, the student must have a total of 30 hours of graduate course work of which at least half of the hours must be 500 level. The student may take, as part of the 30 hours, 3 hours of thesis credit or, in lieu of a thesis, may present a professional paper published (or one accepted for publication) in a professional journal. A copy of the thesis or published paper must be deposited with the department, and two approved copies of the thesis or one copy of the research paper must be deposited with the Graduate School. Decisions on thesis topic, area, tool requirements, definition of professional journal,

etc., will be the prerogative of the committee. From time to time special M.A. programs may be offered within the departmental graduate structure.

Doctor of Philosophy Degree Program

Immediately after being advanced to the doctoral program, the student, in consultation with the chairman of the department or the director of graduate studies, will choose a committee chairman. The committee chairman and student together will then select four additional committee members. One member of the committee must be from outside the department and a second member may also be from outside the department. This committee shall normally direct the student in all subsequent graduate work and, after approval by the graduate dean, shall direct the dissertation. Any changes in the membership of the committee shall be with the concurrence of the student and the committee chairman and notice shall be given to the executive committee.

The requirements for the doctoral program are noted below:

Additional course work. This involves not only work in anthropology but, as discussed above, work in other fields where necessary. The committee is expected to outline a definite course of studies that will usually involve, minimally, an additional academic year of full-time course work.

Tool requirements. These vary from student to student and shall be at the discretion of the committee. The student will in all cases be expected to have a good working knowledge of a major literary language foreign to the student. Other requirements might include such skills as computer science, statistics, econometrics, biometrics, a second language, or any combination of such skills deemed necessary.

After completing the equivalent of the master's degree as defined by the Graduate School, the student must apply to the Graduate School for admission as a doctoral student.

Within such time as deemed advisable by the student and his committee, but not to exceed three years of full-time graduate work, the student will be given a three-hour oral examination covering those areas of anthropology in which he/she is to concentrate. Unless the graduate dean has granted an exception requested by the committee, the student cannot take the examination until two years of full-time graduate work have been completed. As a result of this examination the committee may, by majority vote, decide the following:

(a) The student, having passed the examination, is recommended to the Graduate School for formal candidacy.

(b) The student, having failed the examination, is allowed to retake it after an additional period of study, which is determined by the committee.

(c) The student, having failed the examination, is eliminated from the program.

Students who are allowed to retake the oral examination will usually maintain the same committee for the second examination. At this stage the student may, in consultation with his/her committee chairman and the chairman of the department or the director of graduate studies, still elect to take a master's degree, in which case he/she enters the M.A. program as outlined above.

Ph.D. Candidacy. A student will be recommended to the Graduate School for candidacy when 1, 2, 3 and 4-a above have been completed. At this point the candidate will normally undertake a period of problem-oriented fieldwork.

Dissertation. Under normal circumstances, the chairman and other members of the oral examination committee will serve as the student's dissertation committee. However, changes in the composition of the committee may be made with the approval of the department and the Graduate School. Candidates for the Doctor of Philoso-

phy degree must register for 24 hours of dissertation credit under Anthropology 600.

For the dissertation to be accepted, all five committee members, ideally, should concur; at the least, concurrence of the committee chairman and three of the four other members shall be required.

Following the successful completion of the dissertation, a defense of dissertation shall be held in which members of the Department of Anthropology and of other departments who may be concerned will be invited. All guests may direct questions to the candidate. To pass the dissertation defense, the candidate may have no more than one dissenting vote of his dissertation committee. The student is required to file a copy of his/her dissertation with the department, as well as filing two acceptable copies with the Graduate School.

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 his 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, metalsmithing, and weaving), 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 his 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 those interested in 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. Specific 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 discre-

tion 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 a student in recognition of his or her 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. program.

Admission

The student must be admitted to the Graduate School before he or she 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.

The applicant must have completed a course in each of the following areas (these may be completed concurrently with work toward the degree): A. general botany, B. plant anatomy, C. ecology, D. genetics (with laboratory), E. morphology of vascular and non-vascular plants, F. plant physiology, G. plant taxonomy, H. one year of college chemistry and/or one year of college physics, I. one year of college mathematics, J. one year of college foreign language or reading proficiency in a foreign language determined by a proficiency examination.

Advisement

Following admission to the department and before registration for course work, the student must consult the staff member representing the field of his or her major interest or, if this is unknown, the graduate adviser of the department, for assistance in planning his or her 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 the student's admission into the departmental program, he or she should select a faculty member who is willing to serve as his or her 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 his or her committee to discuss his or her program of courses for the degree and his or her 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 4.0 ($A=5$, $B=4$). Upon falling below this average, the student will be allowed two academic terms to bring his or her average up to 4.0; failing this he or she 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 his or her 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 his or her advisory committee. The M.A. degree requires an additional minimum of one year of 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 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 no longer than six hours, and will cover all major areas within botany. 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 for him or her, and his or her progress in his or her 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 must be unanimous and without conditions. In the event of failure, 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 exam-

ination 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 Admission Test for Graduate Study in Business (Princeton Test) and have the results of the test mailed directly to the assistant dean, graduate studies in business administration. Information regarding this test is available by writing to: Admission Test for Graduate Study in Business, Educational Testing Service, Box 966, Princeton, New Jersey 08540.
3. Complete an interview with the director of graduate programs in business administration. This interview may be delayed in individual cases where a special trip to the campus would require travel in excess of one hundred miles to reach the Carbon-dale campus.
4. An undergraduate cumulative grade point average of 4.00 is preferred, and no less than 3.5 grade point average is permitted for admission. These averages are calculated on a 5.0 scale.

Degree Requirements

A minimum of 30 semester hours of course work plus a terminal examination (oral, written, or both) are required. 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 lack the necessary prerequisites may be required to complete as much as 30 additional semester hours of acceptable course work. Those who enter the Master of Business Administration degree program with deficiencies in the common body of knowledge in business and administration as specified by the American Assembly of Collegiate Schools of Business must complete the foundation courses in a satisfactory manner prior to starting the program 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 director of graduate programs in business administration. Candidates must satisfy requirements in the following areas: quantitative methods, accountancy, administrative sciences, economics, behavioral sciences, legal environment of business, finance, marketing, communications, and business policy.

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 courses in a wide variety of areas of graduate study throughout the University.

Business Education

Graduate courses in the Department of 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 Department of Business Education, with approval dependent upon the preparation, ability, and promise of the individual student. For the Master of Science in Education degree, the department has 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 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 business education, and organization and administration of cooperative vocational business education. A minimum of two of the following business education courses is required: 500, 503, 508, 509, 510. Four-hundred-level courses taken for undergraduate credit cannot be repeated for graduate credit.
2. Eight or more hours in business or economics courses offered by departments in the College of Business and Administration or by the Department of Economics.
3. Eight or more hours in courses offered by departments in the College of Education, other than the Department of Business Education.

Each student's program is tailored to meet his particular needs and interests, within 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 May and July. Broad, essay-type questions are asked that require the student to apply the knowledge he has acquired in solving realistic problems. Each student selects four of the following areas to be included in his 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 chairman, Department of Business Education.

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.

Admission

A student is expected to have an undergraduate major in chemistry including general chemistry and one course of inorganic chemistry, one year of organic chemistry including laboratory, one year of analytical chemistry including introductory instrumental techniques, and one year of calculus-based physical chemistry.

Proficiency Requirements

Placement examinations must be taken in 4 or 5 fields of chemistry (analytical, biochemistry, inorganic, organic, physical) by all chemistry graduate students: upon entering if they matriculated as classified students or when the exams are next given following their change in status from unclassified to classified. Students who fail to pass or fail to take a placement examination in one or more fields of chemistry are required to pass field examinations in some or all of those areas; the number required depending on the specific degree requirements as given below.

As an alternative, a student may pass the field examination in a particular field by completing its equivalent in course work with a grade of *B* or better. Whether these courses apply to the total course requirements for the degree is at the discretion of the student's advisory committee. A required field examination (or course equivalent) must be successfully completed in no more than a total of two trials within four semesters of residence, exclusive of summer terms, counted from the time when the student attains classified status.

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 proficiency requirements in 3 of 5 fields of chemistry.
2. 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.
3. The hours in chemistry must include 6 credit hours in formal course work at the 500 level in one of the five basic fields of chemistry (Chemistry 451a, b may be taken in place of one 500-level biochemistry course) and earn credit in one chemistry course at the 500 level in one other field.
4. Maintain a 4.00 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 reading competence in one of three languages: German, Russian, or French. A language examination will be administered by the department: the student will be asked to write a translation, with the aid of a dictionary, of a passage from the chemical literature approximately 250 words in length. The passage will be selected from a journal or book recommended for this purpose by the faculty in the area of the student's major field of concentration. The examination will last one hour.
8. Prepare and present a thesis on the research accomplished.
9. Pass a final oral examination.

Doctor of Philosophy Degree

Students entering the Ph.D. program either must have a master's degree in chemistry or must meet the requirements of the Graduate School for master's degree equivalency and the requirements of the Department of Chemistry and Biochemistry for the master's degree except for the thesis and oral examination requirements which may be omitted.

In addition, all students in the Ph.D. program must:

1. Fulfill proficiency requirements in physical chemistry and three of the other four fields (analytical, inorganic, organic and biochemistry) of chemistry or complete their equivalent in course work with a grade of *B* or better within four semesters of residence, exclusive of summer terms.

Students fulfilling the proficiency requirements in only 3 fields within the specified period may continue toward the M.S. degree. If their final oral examination is successful, they may petition the faculty requesting permission and conditions to continue working toward the Ph.D. The faculty, acting as a committee of the whole, will rule on such petitions on due consideration of the recommendation of the candidate's graduate committee and of all other pertinent information.

2. Complete a course of study as determined by the student's graduate committee, including at least one course at the 500 level in three different fields.
3. Earn one hour credit in seminar (Chemistry 595) beyond the Master of Science 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 proficiency requirements, a candidate may begin taking cumulative examinations. A graduate student holding a master's degree in chemistry may proceed with the cumulative examinations in those areas in which he has fulfilled the field examination requirements.

- b. A student may elect to take cumulative examinations in his major area only, or he may elect to take cumulative examinations in more than one area. If the student elects the latter course of action, he must so inform the chemistry department graduate adviser at the time that he selects a research director of his intention to pursue a cross-area curriculum. It is the responsibility of the student's graduate committee to determine how the cumulative examinations are to be divided among the 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. 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 written examinations. 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. A student must register to take the examination at least one week before it is scheduled.
 - d. A student must pass 5 examinations in no more than 14 trials in order to continue for the Ph.D. degree. *A student must take consecutive examinations.* He is urged to begin as soon as he is eligible. He is not liable for examinations during any time he is not enrolled in school.
6. Pass a preliminary oral examination following completion of the cumulative examination requirement and the research tool requirement.
 7. Maintain a 4.25 grade-point average.
 8. Demonstrate competence in one of the following languages if this requirement was not fulfilled during previous graduate studies: German, French, or Russian. This requirement must be fulfilled prior to scheduling the preliminary oral examination.
 9. Complete his 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.

Community Development

The following is a description of courses and requirements for the Master of Science degree in community development. A total of 42 credits is required for completion of the program.

Prerequisites

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

Social statistics: 3 semester credits at either the undergraduate or graduate level.

Community Development Core Requirements (30 credits)

CD 401, Introduction to Community Development	3
CD 500, Research Seminar in Community Development (or equivalent)	3
CD 501, Small Group Process in Community Development	4
CD 502, Community and Change (or equivalent)	3
CD 503, Problems of and Approaches to Community Development	3
CD 595, Internship	9

Terminal option: thesis, research report, extended minor or master's project. These 5 credits may be earned in one of the following ways: 5

A. CD 599, Thesis Research

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

C. Five credit hours in 400- or 500-level courses *in addition* to the nine hours in the regular minor (for extended minor)

Other Course Requirements (12 credits)

A. Minor. At least 9 credit hours in 400- or 500-level courses outside community development in one or more disciplines amounting to a minor specialization. 9

B. Electives. Additional 400- or 500-level courses in minor, in elective CD courses or in other departments as needed to total 12 hours outside the core requirements. 3

Electives

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

CD 402, Comparative Community Development 3

CD 403, Consumer Participation in Human Services Delivery 3

CD 491, Independent Study in Community Development 1-6

CD 497, Seminar 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 400 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.

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.

It will be possible for continuing students to select one of these terminal options. However, those students who already have a thesis or research report committee must obtain approval of that committee, as well as of a new committee set up specifically to supervise the new terminal option.

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 his knowledge of community development and upon the quality of his thesis.

The thesis requires a form filed in duplicate with the Community Development Institute specifying the student's committee and his 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 (for use in the reading room), and one

copy is given to the chairman of the student's thesis committee. Thus, four copies of the thesis are required.

2. Composition of the thesis committee consists of three persons, as follows:
 - a. A chairman 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.
3. Composition of the oral examination committee: The thesis committee also serves as the oral examination 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 Community Development Institute specifying the student's committee and his 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 chairman of the student's terminal research report committee.

2. Composition of terminal research report committee. The terminal research report committee consists of a chairman 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 frequently 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 5 hours of course work outside community development *in addition to* the normal minimum of nine hours devoted to minor. Since the student also has 3 hours which are elective, if he decided to devote these to his minor as well, he may have as many as 17 hours in his minor. He must also complete a paper linking the extended minor to community development.

This minor can be departmental (e.g., political science) or interdisciplinary (e.g., urban studies). However, it 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. The program must be approved by the student's extended minor committee.

The extended minor requires a form to be filed in duplicate with the Community Development Institute specifying the student's committee and his 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 chairman of the student's extended minor committee.

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

2. Composition of the extended minor committee. This committee will be made up of a chairman 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. Therefore, he is expected to prepare a 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 Community Development Institute 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 his Master's Project Committee. He will then have an oral examination in which he will be examined upon his general knowledge of community development and upon his master's project.

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

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 may be obtained from the Graduate School, but application forms for admission to the Computer Science program must be obtained from the department. Decisions concerning the admission of students to and their retention in the graduate program will be made by the department faculty subject to 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 student's academic record will be examined for evidence that he 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. No other formal course requirements are stated for admission, but 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 of the student at the time he enters the program. 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, 403, 411, 414
- (b) Each of the CS courses: 445, 451, 464a
- (c) One of the CS courses: 430, 464b, 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 and/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.

Early Childhood Education

(see Elementary Education 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 Degrees

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 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. If the student intends to enter the doctoral program, he 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 is demonstrated by successful completion of the Educational 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 exams 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.

The student is recommended for candidacy for the degree after he passes 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 in Education degree through any one of thirteen approved concentrations: cultural foundations, educational administration, educational psychology, elementary education, guidance and counseling, health education, higher education, instructional materials, 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 in Education degree. General policies pertaining to the Doctor of Philosophy in Education degree 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 Administration and Foundations.

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 assistant 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 semester.

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 dissertation committees. The committee is appointed by the Dean of the Graduate School upon the recommendation of the assistant 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 EDUCATIONAL ADMINISTRATION AND FOUNDATIONS

The Department of Educational Administration and Foundations 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 Administration and Foundations.

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 or its equivalent, in educational administration; (2) objective measures rated on a point scale developed by the department: undergraduate grade point average, graduate grade point average, and the Miller Analogies Test profile rank. A test of the writing ability of the applicant may also be required; (3) 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.

A minimum grade point average of 4.25 on a 5.0 scale is required for retention in the program. A student whose grade point average falls below 4.25 may take an additional nine semester hours of work on his program if such work will correct the deficiency. If after nine hours, the student's GPA remains below 4.25, 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 8 semester hours common to all doctoral students in education; (b) a concentration of 16-22 semester hours including a required 8-hour, 2-course seminar in educational administration; (c) a cognate or interdisciplinary block of 9 semester hours; (d) a dissertation of from 24-32 semester hours and; (e) electives as needed which may be drawn from social and behavioral science fields as anthropology, economics, government, sociology, psychology. This work seeks to provide the student with an orientation to fields that are integrally related to educational administration.

Research 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 professional preparation and goal expectations. Research requirements might include a statistics sequence, computer programming, foreign languages, 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 specialized areas of research, curriculum, supervision, and administration. 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. Stu-

dents 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 4.25 on the first 20 semester hours of course work is required for retention. This minimum average must be maintained for the remainder of the program.

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 Educ. 590 and 591; 2. 24 hours in a specialization: philosophy of education, history of education, comparative and international education, and 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. fourteen 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 member 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 his 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 ELEMENTARY EDUCATION

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

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

Admission and Retention. A minimum of two years teaching experience in elementary school, or equivalent experience as determined by the departmental screening committee, is required. Four recommendations are required from persons who are qualified to judge the applicant's academic and professional competence. The department chairman or his representative secures these recommendations from names supplied by the applicant. At least one recommendation must concern teaching ability. The applicant must take the Miller Analogies Test. Additional examinations may be required. As a part of the total evaluation of the student, some evidence of scholarly writing should be submitted to the department screening committee. The applicant will have a personal interview with the departmental screening committee unless the screening committee judges that the applicant's situation precludes such an interview. The committee may admit the student even if he shows some deficiency from department standards if, in their opinion, the student shows professional promise. The screening committee recommends admission of the student only if the department is willing to sponsor the candidate and has identified a prospective chairman of the student's doctoral committee, a faculty member who holds status I.

Prior to the completion of 30 hours of course work, the student meets with the doctoral committee to determine whether or not he or she will 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 department chairman, to the assistant dean for graduate studies, and to the student. If the committee chooses not to retain the student the reasons are specified in the report.

Program Requirements. A minimum of 64 hours beyond the master's degree and 96 hours beyond the bachelor's degree are required. In addition to the doctoral core requirement in education, each doctoral student will be required to complete successfully El. Ed. 570 before taking the preliminary examination. A student must complete a minimum of 13 semester hours of work in the field of specialization within the Department of Elementary Education, and at least 8 semester hours of course work in cognate areas which may be outside the College of Education. A minimum of 24 hours of dissertation credit must be taken. The balance of the student's program will be in electives that have been selected to support the goals of his program.

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

modern foreign languages; (2) a demonstration of competency in educational statistics or successful completion of Guidance 505 and 506; (3) a demonstration of competency in computer programming; (4) another research competency at the discretion of the doctoral committee. Statistics is strongly recommended.

Preliminary Examination. The preparation and direction of the preliminary examination is the responsibility of the department and the student's doctoral committee. Eight hours of testing are required, four of which must be in general elementary education as prepared by the department and four hours of which may be in the student's area of specialization as prepared by his doctoral committee. Additional oral and written examinations may be required by the student's doctoral committee.

Oral Examination. The Department of Elementary Education requires an oral examination, conducted by the doctoral committee, for each Ph.D. candidate. The examination covers the dissertation and also includes questions designed to ascertain the student's general competence in elementary education and the specialty area.

Oral examinations are open to all interested observers. Notices 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 assistant dean for graduate studies in the College of Education.

The candidate obtains copies of the oral examination form and the dissertation evaluation form from the assistant dean for graduate studies and delivers them to the committee members on the day of the orals.

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 his papers to the new concentration for consideration.

A student will not be permitted to take the preliminary examination unless he or she maintains a 4.25 grade point average in courses taken as a part of the doctoral program. Any student who has a grade point average below a 4.25 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 and/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. 515); 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, each student must demonstrate competency in his or her chosen concentration. Expectations and specific requirements of the preliminary exam are developed by the student and his or her doctoral committee.

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 assistant 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, 515, 531, and 570).
2. The required dissertation credits, of which 24 hours will be the maximum. Howev-

er, 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. 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 be prepared by the doctoral committee of the student. The examination will be composed as follows: advanced statistics—four hours; advanced measurement—four hours; special exam in student's area of interest—four hours. The student's doctoral committee will grade the examination. An oral examination over the preliminary exam will be conducted within two weeks of the written examination.

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 and Retention. Permission to enter graduate programs in Health Education is by application and approval of the department based upon certain 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 chairman of the Department of Health Education.
3. Miller Analogies Test scores must be submitted. Students may take this test on the Southern Illinois University at Carbondale campus.

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 4.25 (based on 5.0 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.

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 has no specific requirements for the concentration in health education. Programs are individually developed with 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 teachers and administrators in two-year colleges and universities and related post-secondary educational institutions.

Recent graduates of the doctoral program have accepted administrative positions in academic affairs, student affairs, and central and business administration. In addition a number of alumni have accepted positions as teachers in all ranks in a wide variety of fields of study.

Application. Inquiries regarding application 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 departmental 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 showing 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 steering committee of the Department of Higher Education. Each application is acted upon by the departmental admissions committee, the steering committee 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 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 four 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

Program Emphasis—Minimum of 16 semester hours. Each student, in collaboration with and concurrence from his or her 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 considered to be 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 ad hoc examination committee of the graduate faculty members in the department. The student may also be asked to complete successfully an oral examination. The student may petition his or her doctoral committee to take the examination when he or she has successfully completed the research competency requirement, the doctoral seminars, and all or most of the course work listed on the approved program.

Candidacy. In addition to the requirements of the Graduate School, the student must have completed all course work for the program prior to being recommended for candidacy by the doctoral committee.

DEPARTMENT OF INSTRUCTIONAL MATERIALS

The doctoral concentration in instructional materials is designed for those individuals who wish to become directors of instructional materials in a large school system, a college, a university, or industry where the scope of the program will require, under the director, separate specialists in the audiovisual and library fields.

Application. Inquiries regarding application should be directed to the chairman of the Department of Instructional Materials.

Admission and Retention. The departmental selection and review committee screens applicants on the basis of prior graduate work, graduate grade point average, and scores on standard tests.

Prior graduate work must provide an adequate background for doctoral study in the field of instructional materials.

A student who has maintained a 4.50 grade point average or higher will be accepted unconditionally, if other criteria are met. Students with grade point averages of 4.25 to 4.50 will be accepted conditionally, assuming other evidence of potential to succeed in doctoral study, with the condition being that at least a 4.50 average must be maintained in the first 16 successive hours of work after conditional admission. Students with grade point averages less than 4.25 will not be considered for the doctoral program.

Applicants must present scores from the Graduate Record Examination (aptitude) and Miller Analogies Test as a part of the admission procedure. Acceptance is usually dependent upon the student's achieving at least the fiftieth percentile on national norms for graduate students in education on at least one of these examinations.

Other data from the application for admission to graduate study, other test performance, reference letters, and prior experience will be gathered as a part of the admission procedure and will be used as means of determining acceptance.

Program Requirements

- 1. Curriculum theory and instructional practice, 8 hours
- 2. Field of Specialization: each student must identify with an area of specialization and must complete from 16 to 32 hours in support of his specialty.
- 3. Cognate Study: to support the field of concentration, 10 to 16 hours of work may be required in a cognate field or fields.
- 4. Dissertation, 24-32 hours
- 5. Electives: to complete minimum requirements and to support the goals of the program.

Research Requirements. Research requirements and the method of demonstrating them are chosen by the student's doctoral committee from the approved research requirements: foreign languages, statistics, and computer programming.

Preliminary Examination. The preliminary examination may be taken only after the student has completed the doctoral seminar sequence, all or most of the course work, and has satisfied the research requirements. The purpose of the preliminary examination is to examine the professional preparation of the student on all of his or her previous graduate work. The department is responsible for preparation and evaluation of the preliminary examination, consistent with the College of Education policies and procedures.

DEPARTMENT OF OCCUPATIONAL EDUCATION

The Department of Occupational Education 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 Occupational Education.

Admission and Retention. Admission to the concentration is determined by a 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.

A grade point average of at least 4.25 on the first thirty hours is required for retention and must be maintained for the remainder of the program.

Program Requirements

Doctoral seminar sequence in education	8 hours
Occupational Education doctoral core	15 hours
Oc. Ed. 502-3, 505A-3, 505B-3, 525-3, 575-3	
Supportive studies (student completes one)	9 hours
Management specialization: Oc. Ed. 510-3, electives 6	

Professional development specialization: Oc. Ed. 589-3, electives 6	
Research specialization: Oc. Ec. 581-3, electives 6	
Internship (related to the specialization)	8 hours
Dissertation or doctoral project	<u>24</u> 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 Department of Occupational Education, 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 student has not passed, he will be dismissed from the program.

DEPARTMENT OF PHYSICAL EDUCATION

The Departments of Physical Education for Men and Physical Education for Women participate in the Doctor of Philosophy in Education degree with a concentration in physical education.

Inquiries regarding application should be directed to either the chairman of the Department of Physical Education for Men or the chairman of the Department of Physical Education for Women.

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 4.50 is required in courses taken as part of the doctoral program. If at any time the grade point average is less than 4.50, 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 assistant 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, and 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 SECONDARY EDUCATION

The Department of Secondary Education participates in the doctoral program in education with a concentration in secondary education.

Inquiries should be directed to the coordinator of doctoral studies in the Department of Secondary Education.

Admission and Retention. Admission is determined by a screening committee composed of a minimum of three members of the graduate faculty of the department. The candidate is usually requested to have a personal interview with the committee.

The criteria considered in this decision are: (1) the nature and quality of previous graduate work; (2) the undergraduate grade point average; (3) performance on the Miller Analogies Test (recommended minimum of fiftieth percentile) and other tests of academic potential recommended by the screening committee; (4) the employability of the applicant at a level commensurate with the degree upon completion of the doctoral program; (5) the quality of samples of the applicant's written work; (6) evidence of a minimum of two years of successful teaching experience in secondary schools; (7) letters of recommendation relative to professional and academic competence; and, (8) a willingness on the part of a member of the department to sponsor the applicant in the process of completing the Ph.D. degree.

The chairman of the student's doctoral committee will meet with the student upon the completion of one-third of his or her doctoral course work to evaluate the student's progress toward the Ph.D. degree. If, in the opinion of the chairman, satisfactory progress is not being made toward completion of the degree, the chairman will convene the total doctoral committee to determine whether the student should continue in the doctoral program. The chairman must notify the student, the coordinator of doctoral studies of the department, and the assistant dean for graduate studies of the college of the action of the student's doctoral committee.

Program Requirements. Areas of specialization with the concentration in secondary education include: (1) college or university teaching and research in the general area of secondary education; (2) college or university teaching and research in the subjects typically taught in secondary schools (example: English education, art education, social studies education, mathematics education); (3) curriculum direction at the local school, school district, intermediate educational unit, state, or national

levels; (4) supervision of secondary education programs and subjects at the levels listed above; and (5) teaching in the secondary schools.

The typical program of studies consists of 64 semester 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 which is required of all secondary education students (19 hours) (S. Ed. 508[3], current developments in selected subjects in secondary schools; and/or S. Ed. 562[3], secondary school curriculum; S. Ed. 566 [2], seminar in instruction; S. Ed. 571 [3], seminar in curriculum; S. Ed. 572[3], seminar: research and evaluation in the secondary school education; Departmental electives [8], courses to be selected from graduate level courses currently offered in the Department of Secondary Education); (3) field of specialization and cognate study: at least 13 hours elected with the approval of the doctoral committee. The student interested in a subject field such as English education, English as a second language, social studies, mathematics education, art education, home economics education, music education, reading, science, etc., should specialize in the subject area. The student pursuing a program in curriculum, supervision, or secondary education in general might elect courses to meet certification requirements and courses that provide field experiences; and (4) dissertation (24 hours).

Research Requirements. The research competency will be determined by the doctoral committee with consideration given to the student's dissertation topic, and the student's professional area of interest.

The student's doctoral committee, the coordinator of doctoral studies, and the assistant dean for graduate studies of the college must approve an unusual research competency necessary for specialized research (example: historiography).

Preliminary Examination. Prior to taking the preliminary examination a student must have met the research requirement, fulfilled the doctoral seminar sequence in education requirements of the college, completed two years of full-time study (or the equivalent) beyond the baccalaureate degree, and be certified as prepared for the examination by his doctoral committee.

Upon completion of these prerequisites and with the approval of the student's doctoral committee, the student applies to the coordinator of doctoral studies for permission to take the examination.

The preliminary examination is in three parts: (1) a written examination of approximately four hours focusing on the departmental core work prepared and evaluated by the Department of Secondary Education; (2) a written examination of approximately four hours in length directed toward the student's specialization, prepared and evaluated by his doctoral committee; and (3) an oral examination approximately one hour in length administered and evaluated by the student's doctoral committee.

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 4.25 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 of the applicant.

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 4.25 grade point average for the first 30 hours of doctoral course work, the student must maintain a cumulative grade point average of 4.40 for all work completed before the preliminary examination (approximately the first 60 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 must also complete a minimum of 27 semester hours, approved by their committees, from specific courses in the Departments of Educational Administra-

tion and Foundations, Guidance and Educational Psychology, Elementary Education, Instructional Materials, 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.

Educational Administration and Foundations

This department carries extensive graduate offerings in educational administration, instructional supervision, and educational foundations in support of the Master of Science in Education degree and the Specialist degree in educational administration and the Doctor of Philosophy degree in education. Programs at all levels are NCATE approved.

The department administers its programs leading to the master's degree and Specialist degree, and provides programs and personnel for doctoral students who wish to specialize in educational administration, general instructional supervision, and educational foundations. Interested applicants should direct inquiries to the chairman of the department.

Master of Science in Education Degree

At the master's level, concentrations are offered in educational administration and in instructional supervision. Within the administration concentration specializations may be selected for positions as elementary principal, secondary principal, curriculum coordinator, school business manager, vocational-technical director, etc. A minimum of 32 semester hours is required.

Admission to master's degree work in the department is approved by the department admission committee. Considerations 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 personal interview with the candidate.

The Department of Educational Administration and Foundations in cooperation with other academic units offers a program leading to the Master of Science in Education degree in educational administration with a concentration in adult education. Inquiries about this concentration should be directed to the coordinator of studies in adult education, College of Education, Southern Illinois University, Carbondale, Illinois 62901.

The program for the Master of Science in Education degree in educational administration with a concentration in educational administration includes a basic core: administration, EDAF 501 and 503; research and tool subjects, EDAF 500, Guid. 505

or 502, and EDAF 575; a foundations course (e.g., EDAF 430, 432, 454); and a course in curriculum (i.e., EDAF 511, Elem. Ed. 561, or Sec. Ed. 562). Elective courses are determined by the student and his adviser, dependent on the student's specialization. A research report and comprehensive oral examination are also required. It is recommended that an applicant have at least two years of successful teaching experience prior to or concurrent with the program.

Regulations for the master's degree with a concentration in instructional supervision 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, (i.e., elementary, secondary, or both). The department encourages a cross-departmental approach in the selection of appropriate courses for individual programs.

Specialist Degree

The Specialist degree program is structured on a 30 semester hour sequence: eight semester hours in advanced administration seminars, EDAF 551 and 553; six semester hours in interdisciplinary seminars, EDAF 559 and 561; four semester hours in an administrative internship, EDAF 595; and three semester hours in independent investigation, EDAF 596. Additional elective courses, totaling a minimum of nine semester hours, 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.

Admissions criteria include a minimum graduate grade point average of 4.25 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 administrative training will be required to complete prerequisite work as determined by the student's committee.

Elementary Education

The Department of Elementary Education offers programs leading to the Master of Science in Education degree in elementary education, the Master of Science in Education degree in early childhood education, and the Specialist degree in elementary education. The department also offers course work toward a concentration in elementary education for the Ph.D. degree in education.

The Master's Degree

The Master of Science in Education degree requires a minimum of 30 semester hours, of which at least 15 must be on the 500 level, and completion of Guid. 422 and EDAF 500 or the equivalent, as well as completion of courses listed below with the specific concentration.

Unconditional admission to the master's program requires that the applicant hold a teaching certificate appropriate for one or more grade levels (K-9), and have an overall undergraduate grade point average of 3.7 or higher on a 5.0 scale.

The early childhood program requires the following courses or their equivalent: El.Ed. 475J or 560, El.Ed. 537, Guid. 562a, and El.Ed. 517.

The elementary education program consists of a general elementary education program or the following specialty programs: language arts, mathematics, reading, science, social studies, and supervision. The general program requires the following courses or the equivalent: El.Ed. 441 or 442, 410e or 437e, 505, 542, 543, 533 or 563, and 561. A student selecting a specialty program is required to have his program approved by an adviser from the specialty area.

If a thesis is not written, the student is required to write a research paper under the guidance of a department faculty member and to take the departmental master's examination. A total of 3-5 semester hours should be selected from departments outside the College of Education. Students seeking certification in elementary school administration may enroll in the Department of Educational Administration and Foundations or the Department of Elementary Education. The assistant dean for graduate studies in the College of Education will be the recommending officer for administrative or supervisory certification.

Uncertified students who desire certification for K-9 must be admitted to the teacher education program and are required to complete without graduate credit a minimum of the following: Educ. 301; Educ. 302 or El.Ed. 316 (early childhood methods and curriculum); El.Ed. 337 (elementary school reading); and at least two courses from the following: El.Ed. 310 (mathematics); El.Ed. 423 (language arts); El.Ed. 441 (science); and El.Ed. 424 (social studies). In addition, uncertified students must complete at least 5 semester hours of student teaching. The teaching must be done in residence at a university or college approved by the National Council for Accreditation of Teacher Education.

Specialist Degree

The Specialist degree constitutes a minimum one-year program beyond the master's degree, requiring from 30-32 semester hours depending on the area of specialization chosen. This degree program is designed (1) to prepare specialists and supervisors for preschools, elementary schools, and middle schools and (2) to upgrade qualifications and specialized performances of teachers.

Students must meet minimum Graduate School standards for admission to and retention in the specialist program. No more than six semester hours earned at another college or university may be accepted toward requirements for the Specialist degree.

Each student entering this program will be directed by a three-member committee. At least one member of this committee will be from the student's area of specialization. The student's program will be planned cooperatively with this committee and course work will be chosen from four areas: (1) foundations, (2) specialization, (3) supporting disciplines, and (4) internship or practicum. No program will exceed 15 hours of work at the 400 level. The selection of 400 level courses is permitted outside the College of Education when approved by the specialist committee.

Each student will be required to successfully complete a written and/or oral examination after earning 15-16 hours of graduate credit in this program. Prior to graduation a written report of field study, internship, or practicum must be submitted to the specialist committee with a final approved copy submitted to the Graduate School. A final oral examination will be conducted by each student's committee.

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:

Department of Electrical Sciences and Systems Engineering:
circuits, electronics, digital systems, energy conversion, bio-engineering, systems analysis and design, controls, instrumentation, and electromagnetics.

Department of Engineering Mechanics and Materials:
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.

Department of Thermal and Environmental Engineering:
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 his 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 38 semester hours of acceptable graduate credit is required. In this non-thesis option, students are expected to take at least 23 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 fel-

lowships 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 students 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 area 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-Carbondale, or its equivalent elsewhere.

A copy of the undergraduate curricula may be obtained from the program administrator.

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 16 semester hours and include courses in medical instrumentation, neurophysiology, sensory processes, 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. A minimum of 8 hours of elective courses at the graduate level make up additional requirements for the degree (30 semester hours).

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 in 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 he is submitting for credit, where and when the course was taken, and the grade. He should equate, as nearly as possible, the course to be transferred with a course offered by the SIU Department of English. The student will then be assigned to the appropriate faculty member, who will examine him 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 his entire graduate program, the student may accumulate up to 3 hours of work below *B*, so long as he maintains a 4.0 or 4.25 average. If he has accumulated more than 3 hours, but fewer than 10 hours, of grades below *B*, he must replace the hours of *C* or lower with 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 he has reduced the total of deferred work 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 585, 595, and 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 teaching assistant) English 585.

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 his selection of areas in English and American literature that have been approved by his advisory committee. If he passes the examinations, the department will recommend him 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 three 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 three courses numbered 400 or above with an average grade not lower than 4.0 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 teaching 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 506, 507, 508, or 509) in bibliography and research techniques and enroll in research problems (FL 566, 567, 568, or 569), two semester hours of which may be applied to the satisfaction of the research paper requirement.

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

There are four programs of graduate study in Spanish: Hispanic linguistics, Peninsular Spanish literature, Spanish American literature, and general Hispanic studies.

The student will select one of these concentrations in consultation with his graduate adviser. The minimum requirements for each program are:

Hispanic Linguistics	
Required courses: Span 510-2, Span 536-1, FL 569-3	6
Course work for students writing a thesis: 7-10 hours in Hispanic-Linguistics courses, plus 3-6 hours of thesis; for students writing a research paper: 11 hours in Hispanic-Linguistics courses, plus 2 hours of research problems.	13
Course work in Peninsular Spanish Literature	4
Course work in Spanish American Literature	4
Elective graduate work	<u>3</u>
	30

Peninsular Spanish Literature	
Required courses: Span 510-2, Span 536-1, FL 569-3	6
Course work for students writing a thesis: 9-12 hours in Peninsular Spanish Literature, plus 3-6 hours of thesis; for students writing a research paper: 13 hours in Peninsular Spanish Literature plus 2 hours of research problems.	15
Course work in Hispanic Linguistics	3
Course work in Spanish American Literature	3
Elective graduate work	<u>3</u>
	30

Spanish American Literature	
Required courses: Span 510-2, Span 536-1, FL 569-3	6
Course work for students writing a thesis: 9-12 hours in Spanish American Literature, plus 3-6 hours of thesis; for students writing a research paper: 13 hours in Spanish American Literature, plus 2 hours of research problems.	15
Course work in Hispanic Linguistics	3
Course work in Peninsular Spanish Literature	3
Elective graduate work	<u>3</u>
	30

General Hispanic Studies	
Required courses: Span 510-2, Span 536-1, FL 569-3	6
Course work in Hispanic Linguistics	6
Course work in Peninsular Spanish Literature	6
Course work in Spanish American Literature	6
Students writing a thesis take 3-6 hours of 599 (if less than 6 hours are taken, remaining hours are taken in elective graduate course work). Students writing a research paper take 2 hours of FL 509, plus 4 hours of elective graduate course work.	<u>6</u>
	30

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 3.7 is required for admission ($A=5.0$). The department will permit conditional entry between the 3.5 and 3.7 grade point average level. Grade point average of 3.7 or higher is required for stipend eligibility when available.
2. The student is required to provide proof of his proficiency in technical writing. Normally an expository essay is required to evaluate whether the student should have remedial grammar or writing courses.
3. Three letters of recommendation from former professors, employers or other responsible individuals are required.
4. The aptitude test of the Graduate Record Examination is required of all applicants.
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 he desires to study. All correspondence should be directed to the Chairman of the Department of Forestry.

Retention and Completion Requirements

Once on campus and during the second term of residence, 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 deadline for receipt of applications and official transcripts in the office of the Graduate School:
 - (a) The second Saturday in July for admission to the fall semester.
 - (b) The last Saturday in October for the spring semester.
 - (c) The last Saturday in March for 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 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.
7. Completion of final, typed or reproduced review copies of thesis and submission

to advisory committee at least one week in advance of oral defense of thesis. Hand-written 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 individual himself. 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.

1. 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.

2. 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.

3. Urban Forest Management: in this area the graduate program may focus on urban forestry including urban park planning and management.

4. 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.

Students in the outdoor recreation resource management concentration may elect to complete either a thesis or a research paper.

Assistantships and Fellowships

Five to ten research assistantships are sponsored each year by the McIntire-Stennis Cooperative Forestry Research Act. Five research assistantships financed by the experimental farms and three teaching assistantships funded by the School of Agriculture are also available.

In addition to general awards made through the Graduate School, various stipends for research studies are available through the auspices of 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 (FOR 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, thirteen 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 and research purposes. In particular, we are conducting or planning research and demonstration programs on forest plots and experimental fields of the 3000 acres of Southern Illinois University at Carbondale and its experimental farms. We also have access to wooded lands of the 6000 acres of the SIU Little Grassy Outdoor Laboratory, 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 acre 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.

(c) The department also has access to a variety of private corporation lands, including strip mines, timber management, and pulp operations.

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 or in higher education with a teaching specialty in geography.

Each student's progress will be assessed each term by the faculty in a meeting within 10 days after the beginning of the ensuing term. For that meeting, a written statement, based on faculty reports of his performance will be generated 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. Unsatisfactory progress will be brought to the attention of the graduate research, program, and professional activities committee for recommended action by the faculty.

Master's Degree

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

Selection of a Tentative Adviser. Students admitted to the master's program should expect to qualify for the master's degree, normally within a 24-month period. Incoming students should choose a tentative adviser no later than two weeks after the beginning of their first term of residence. The choice will be made in consultation with the chairman of the department and with the consent of the prospective 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, Geog. 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 graduate research, program, and professional activities committee of the department for its comment and subsequent approval. The proposed course of study shall include the following core program: Geog. 500-4, principles of research: meaning, philosophy, science, reasoning, creative endeavor, problem identification in research; research methodology; preparation of project statements (in the student's area of interest), analysis, and results in a multi-disciplinary approach.

At least two courses from the following, depending on the student's background:

Geog. 432a - 4, Urban Climatology of the Environment

Geog. 432b - 4, Hydrologic Climatology

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

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

Geog. 424 - 4, Regional Problems in Resource Management

Geog. 425 - 4, Water Resources Planning Simulation

Geog. 470 - 3, Urban Planning

Geog. 471 - 2, Regional Planning

Seminars: each student will include four hours of geography seminars in his program.

Master of Science in Education

For a Master of Science in Education degree in secondary education with a teaching specialty in geography, besides 13 hours in education courses, a student is expected to complete at least 17 hours of course work within the Department of Geography, including at least four hours of geography 500-level seminars; Geog. 514 - 2; and two courses from: Geog. 430, 432a, 432b, 442, 443, 522, 424, 425, 470, and 471. Students may also enroll in a program leading to the Master of Science in Education degree in higher education with a teaching specialty in geography.

Master's Advisory Committee

Students must write a thesis. Before the end of the second term of the student's program, an adviser and committee must be arranged and approved by the faculty. The committee must implement the following at that time:

1. Circulate the student's preliminary thesis proposal to the faculty for comment and

recommendation to the master's advisory committee where approval must be obtained prior to the student's registration for thesis hour credit.

2. Provide for a faculty evaluation of the student's performance.

3. A student enrolled in the master's program in geography will request that his advisory committee determine whether he should receive the Master of Science or the Master of Arts degree, depending on the type of tools developed as well as the nature of the thesis.

Completion of Requirements. The finished thesis will be submitted to the master's advisory committee for approval. The judgment of the committee will be expressed to the student and forwarded to the chairman for recommendation to the Graduate School for the conferring of the master's degree.

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 and resource management systems. Although it assumes a broad background comparable to that provided by the M.A. or M.S. programs, the Ph.D. program is designed to develop a comprehensive yet a 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 he proposes creative research.

Program. The student and his 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 master's program.

The student, adviser, and committee will ascertain the tools and cognate courses appropriate and will certify proficiency.

Each student will include three research seminars in his 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.

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 within the following two fields of specialization: physical environmental systems and resource management systems.

The written portion of the comprehensive examination will be prepared by the student's doctoral committee which will evaluate the performance and judge the student's success or failure. The examination then will be circulated to the graduate faculty.

The graduate faculty will be invited to the oral examination which will take place in not less than one week nor 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.

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

The Dissertation. The student's written dissertation will be circulated to members of his doctoral committee 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 he can be officially admitted to the master's program in geology. The student will be expected to have satisfactorily completed at the undergraduate level 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 his program is determined by his career goals and the results of informal preassessment interviews with individual 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. His 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 his courses.

In order to pass the final oral examination a student must receive a favorable majority vote from his thesis committee, meeting in formal session. Should the student fail the final oral examination, he may, upon concurrence of a majority of his 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 his second attempt, he will be ineligible for the master's degree from the Department of Geology.

Two copies of the approved thesis must be presented to the Graduate School at least three weeks prior to graduation and a third copy must be presented to the Department of Geology.

Assistantships

Teaching assistantships are awarded and supervised by the Department of Geology. Research assistantships are usually available only from research grants of individual faculty members and are supervised by the faculty member in receipt of the sponsoring grant. Research assistantship awards require 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 leading to the Master of Science in Education degree in guidance and educational psychology with a concentration in adult education. Inquiries about this concentration should be directed to the coordinator of studies in adult education, College of Education, Southern Illinois University, Carbondale, Illinois 62901.

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 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 3.70 grade point average (based on 5.0 as A) in the undergraduate degree will be admitted to graduate study. Those students whose averages are below 3.70 but above 3.40 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 his 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 preparing him 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, adolescent, or adult counseling. The student is expected to develop competence in counseling, consultation with teachers, administrators and other mental health personnel, and assessment procedures. He 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:

3.1 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.

3.2 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.

3.3 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.

3.4 Interpersonal relationships with your peers and other educators which influenced your decision to enter education which may affect your success as a professional educator.

3.5 The role you perceive to be that of the educator-counselor as he relates to the students, the faculty, and the administrative staff.

3.6 The social issues which you believe to be most important to mankind today.

3.7 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 4.0.
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 the student, signed by his adviser, must be submitted one month prior to the examination date. Should the candidate fail to pass comprehensive exams, he can expect to complete additional work as determined by the examining committee.
3. The completion 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 day 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

Secondary and Adult: students interested in counseling adolescents and adults in secondary and higher educational settings are required to complete 24 semester hours in 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)
- 494b Adolescent and Adult Counseling Practicum (3 hrs)
- 494c Career Planning Practicum (3 hrs)
- 599 Thesis (3 hrs)

The student's 12 hours of elective courses will be determined jointly by himself and his academic adviser.

Elementary: students interested in counseling children in elementary schools and agencies are required to complete 20 semester hours in the following courses offered by the department:

- 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)
- 494 Child Counseling Practicum (3 hrs)
- 599 Thesis (3 hrs)

The students 16 hours of elective courses will be determined jointly by himself and his 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.

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 student's program will be determined jointly by himself and his academic adviser in accordance with the following departmental requirements.

I. Learning: 6 hours. Graduate courses in this area offered by any department are acceptable.

II. Design & Quantification Procedures: 9 hours. Guidance 567, topical seminar-experimental design in behavioral science, 3 hours. Guidance 505, introduction to statistical methods, 2 hours. Guidance 506, advanced statistical methods, 4 hours.

III. Social-Developmental: 6 hours. Graduate courses in this area offered by any department are acceptable.

IV. Thesis: 6 hours.

V. Elective: 5 hours.

A total of 32 semester hours is required.

APPLIED INSTRUCTIONAL PSYCHOLOGY

Program Objectives. The master's program with a specialization in applied instructional psychology is designed for individuals engaged in the design, delivery, and evaluation of instruction. It focuses on the skills of instruction rather than on any particular content area (e.g., reading, social studies, technical training, etc.). As such, the program is appropriate for specialists in all content areas. Likewise, the program is appropriate for individuals involved in the design, delivery, and evaluation of both live (teacher based) and pre-recorded instruction (films, books, programmed texts, computer based instruction). Therefore, the program is intended to appeal to instruction specialists from a number of diverse settings (elementary and secondary schools, community colleges, colleges and universities, all branches of the military, business and industry, correctional institutions, publishing companies, etc.).

Curriculum. Students will have extensive practicum experience throughout the program as well as classroom learning activities. The program requires 32 semester hours which can be completed in three semesters. An ideal schedule for completing the required courses is as follows:

First Semester

Guid 515 - 3 hrs - The Psychological Aspects of Instructional Design

Guid 516 - 3 hrs - Design, Delivery, & Evaluation of Instruction for Concept and Principle Learning

Guid 521 - 3 hrs - Analysis of Classroom Behavior—Consultative Practices for School Personnel

Elective - 3 hrs

Second Semester

Guid 517 - 3 hrs - Design, Delivery & Evaluation of Instruction for Intellectual Strategy Learning

Guid 518 - 3 hrs - Design, Delivery & Evaluation of Instruction for Affective Learning

Elective - 3 hrs

Elective - 3 hrs

Third Semester

Guid 595 - 8 hrs - Internships in Applied Instructional Psychology

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 Depart-

ment 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
- 2. He must complete the application for admission to the department and comply with all other departmental 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 4.25 graduate grade point average (based on 5.0 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 505 (Introduction to Statistical Methods) or Equivalent |
| (b) Measurement | Guid 530 (Standardized Testing) or
Guid 531 (Principles of Measurement) 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 (Developmental 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 4.25 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.

Required Hours

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

Health Education

The Department of Health Education offers three concentrations for the Master of Science in Education degree in health education: school health education, community health education, and safety education, and participates in the Ph.D. degree in education.

Admission

Permission to enter graduate programs in health education is by application and approval of the department and fulfillment of certain 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 3.70 grade point average (A=5.0) to be admitted in good standing. Students with grade point averages below 3.70 but

above 3.40 may petition the department and, if accepted, will be admitted conditionally in accordance with regulations of the Graduate School.

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

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:

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.

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 recommended.

Higher Education

The Department of Higher Education offers graduate work 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 offers graduate work leading to the Master of Science in Education degree in higher education with a concentration in adult education. Inquiries about this concentration should be directed to the coordinator of studies in adult education, College of Education, Southern Illinois University, Carbondale, Illinois 62901.

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 business or to have 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 evaluated 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 his adviser in planning his program; each student also has a committee which assists in reviewing his progress, in supervising his thesis or research paper, and in administering the final examination. The records of each master's student are reviewed periodically by his adviser and committee to determine whether the student should continue in the program.

Program Requirements. Each student will develop with his adviser a suitable sequence of courses that will help him reach his stated 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

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.

College Student Personnel: 40 semester hours (minimum)

Required Courses: 15 semester hours, including 2 hours of credit internship

Hi Ed 515 - 3 College Student Development: Operations and Policies

Hi Ed 516 - 3 College Students and College Cultures

Hi Ed 525 - 3 Philosophy of Higher Education

Hi Ed 595 - 2 Internship in Higher Education

Guidance 502 - 4 Basic Statistics

An internship experience (paid) is required.

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

Community and Junior College Teaching: 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:

Oc. Ed 485 - 3 Principles and Philosophy of Vocational-Technical Education (for those planning to teach in an occupational program)

Hi Ed 595 - 2 to 8 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 his research competency through writing an acceptable master's thesis or a research paper. A student selecting academic administration or college and university business affairs is usually asked to write a thesis and to demonstrate research competencies as outlined by his 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. The student should consult his academic adviser 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. 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 letters and report: three letters from former teachers, preferably at the graduate level; a letter in which the applicant expresses his professional and personal objectives; and a report of the result of the aptitude test (both 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 administering 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 Department of History strongly recommends that each candidate be enrolled in at least one 500-level course each semester during his first two semesters in the program. 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 505 and 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, 311F (Advanced Fortran), and a third course in computer science approved by the history department. The candidate may elect to 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 his 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, but the fields may not be in the same division.

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

Medieval

England since 1600

Europe, 1450-1789

Europe, 1789 to present

The Doctor of Philosophy Degree

Students seeking the Ph.D. degree in history 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 he will be examined.

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 three 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

Ancient

Medieval

England since 1600

Europe, 1450-1815

Europe, 1789 to present

Each student will be responsible for five fields; either all five in history or four in history and one in a minor subject. For his preliminary examinations, the student will present four fields, all in history or three in history and one in a minor field. He 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 his 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 his 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 should come from the following areas: regions of special concern to the United States (e.g. the Caribbean), rapidly developing regions (e.g. Mexico), and underdeveloped areas (e.g. the Andean states), with major attention falling within the nineteenth and twentieth centuries. Subjects in European history may fall within any field listed in division III except ancient. 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

The Master of Science degree in home economics is offered with concentrations in child and family, clothing and textiles, family economics and management, food and nutrition, and home economics education. The Department of Home Economics Education offers a program leading to the Master of Science in Education degree in home economics education.

Child and Family

The concentration in the Department of Child and Family is designed to give students a knowledge and understanding of human development and the family, with a special emphasis on physical and psychological needs of children. Practicum training facilitates a recognition and appreciation of educator-child, parent-child, therapist and counselor-child relationships in the interest of human improvement.

Clothing and Textiles

Graduate courses in the Department of Clothing and Textiles are directed toward increasing the student's knowledge of historical background, current practice, and new developments in production, distribution, and consumption of textiles and clothing with consideration of aesthetic, economic, physical, chemical and socio-psychological variables. These courses are oriented toward employment by college, business, industry, or government.

Family Economics and Management

The concentration in the Department of Family Economics and Management seeks to develop students' understanding and knowledge of factors associated with family resource management. Specific areas of concern are resources of economically disadvantaged families, the consumer's ability to handle available resources, and social and economic aspects of housing the family from the viewpoint of the household and the community. The program is flexible and allows students from varied back-

grounds to develop competency in one or more of several specializations: family and consumer economics, home management, housing, equipment, and interior design.

Food and Nutrition

The concentration in the Department of Food and Nutrition provides advanced knowledge in human nutrition and food science. It is concerned with basic research on the function of nutrients, the science of food, and the practical application of this knowledge to the improvement and maintenance of health in all individuals.

Home Economics Education

Graduate programs in the Department of Home Economics Education are designed to provide advanced professional training for those persons who wish to teach home economics, including occupational and consumer-homemaking programs in secondary schools, postsecondary and adult or college classes. 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.

Degree Requirements

To be admitted to the program for the Master of Science degree in home economics the student must:

1. Be admitted to the Graduate School.
2. Complete an undergraduate degree which need not necessarily be in home economics. Deficiencies in course prerequisites to the graduate courses may be made up after acceptance into the program. Courses taken to satisfy prerequisite deficiencies will not apply to minimum hourly requirements for the degree.
3. Complete any additional departmental requirements which may include the Graduate Record Exam and letters of recommendation.

To qualify for the Master of Science degree in home economics, a student must:

1. Meet the general requirements of the Graduate School.
2. Complete a minimum of 21 hours in the area of concentration.
3. Complete an additional 9 hours in approved related fields under the direction of the advisory committee.
4. Satisfactorily complete Guidance 502 or equivalent and research methods 500 as approved by the department.
5. Complete departmental requirements for a thesis or research paper.

The department chairman will guide the student in the selection of an advisory committee. The advisory committee will consist of three faculty members qualified for graduate faculty status. The advisory committee chairman, in conjunction with the committee, will approve and coordinate the student's program of study, prospectus, thesis or research paper, and comprehensive examination.

Home Economics Education

The Master of Science in Education degree in home economics education may 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 educational programs.
- F. Junior college teaching.

In addition, a student enrolled in a program leading to the Ph.D. degree in education with a concentration in secondary education, may select the elective portion of his program from graduate courses offered in the Department of Home Economics Education.

Departmental 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.

Departmental 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 22 hours in home economics education 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, subject-matter areas in home economics; anthropology, art, psychology, sociology, and technical and industrial education.
- B. Required courses for all students in the home economics education program are: Guidance 502, introduction to statistical methods; HEEd 500, 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 HEEd 510 in their programs.
- D. Students preparing for positions listed in B and C above will include HEEd 510 and when possible—594, 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, in addition to the home economics education requirements.
- E. Students preparing for work in occupational education programs include HEEd 485, principles and philosophy of vocational-technical education; HEEd 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; HEEd 485, 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.

Instructional Materials

The Department of Instructional Materials offers courses of study leading to the Master of Science in Education degree in instructional materials. Concentrations may be in any of three areas: instructional materials, audiovisual, or library service. The concentration in instructional materials is recommended for most students, for it gives a broader base of study and the public schools are moving toward educational media centers rather than toward the separate areas of audiovisual and library service.

The program of the M.S. in Ed. degree in instructional materials involves professional training in both audiovisual education and school library service. It meets the state and national certification standards for full-time school librarians and the standards recommended by the Association for Educational Communication and Technology of the National Education Association. In Illinois every school librarian is also required to have earned a teaching certificate.

Thirty-two hours are required. No minor is required. At least 16 hours must be in courses numbered 500 or above. The only required course is a course in research methods. Students may elect to write a thesis or a research paper for the degree.

The minor in school library service is offered for students taking a major in another area.

Students interested in doctoral work in instructional materials may enroll for the Doctor of Philosophy in Education degree with a concentration in instructional materials. Procedures and qualifications for the degree are those established by the College of Education.

Inter-American Studies

Course work in the inter-American studies field is offered by the Departments of Anthropology, Economics, Foreign Languages and Literatures, Geography, History, and Political Science and leads to the Master of Arts degree in inter-American studies.

Prerequisites for the Master of Arts degree include a command of the Spanish language adequate to meet the student's needs for research and communication within the area of his program. The chairman of the Inter-American Studies Advisory Committee will determine the student's linguistic competence on registration and, where necessary, specify what the student must do to improve his proficiency in Spanish. Whenever the student's program involves the need for Portuguese or French, he will also need to demonstrate or attain satisfactory proficiency in that language. In addition, a satisfactory basic preparation in inter-American studies is required.

Requirements for the Master of Arts Degree

1. The completion of at least 20 hours in courses acceptable for graduate credit in one of the above listed departments.
2. The completion of a minimum of 10 hours of related studies approved by the student's supervisory committee. To meet this requirement students may select courses in a maximum of three fields.
3. The completion of a satisfactory thesis on a Latin American topic in the major department for which 3 to 6 hours of credit are given.

In every case the student's final program must be approved by his graduate supervisory committee, acting under policies established by the inter-American studies advisory committee.

Journalism

The School of Journalism offers graduate programs leading to the Master of Arts, the Master of Science and the Doctor of Philosophy degrees in journalism. Students in journalism programs may concentrate their work in these general areas: journalism history, behavioral studies, legal studies in communication, and current problems of the mass media. The Ph.D. and Master of Arts 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. The Master of Science degree is a media-oriented degree designed to be of benefit to those who wish to prepare themselves to be more proficient in their profession and does not involve the intensive research required in preparing a thesis.

Admission to the Degree Program

Students seeking admission should consult the appropriate section of the Graduate Catalog. GRE Aptitude Test scores are requested when the grade point average or other factors create questions about admission. Students without a previous journalism degree are required to take some undergraduate courses for no credit as a way of building background. The amount of course work to be taken to build background 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 6 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 12 nor more than 16 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, and economics.

When all course work has been completed (with all incomplete and deferred grades removed) and with a minimum 4.0 grade-point average, each student must pass a written comprehensive examination. The examination consists of four sections: research methodology, contemporary problems in journalism, theoretical concepts, and one section dealing with the thesis area.

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 exams, or failure to maintain continuous progress toward completion of degree requirements serve as reasons for dismissing a student from the program. Additional work may be required of those students whose progress is interrupted.

Master of Science Degree

Students earning the Master of Science degree are required to pass a minimum of 36 semester hours of approved graduate courses with a minimum grade point average of 4.0. No credit will be earned in readings, practicum, or individual research. No fewer than 22 nor more than 26 semester hours of course credits are to be earned in the School of Journalism. Remaining credits may be earned in other academic units in graduate courses pertinent to each student's educational and professional goals.

The student must pass a combined written and oral examination during his second or third semester. The student chooses the semester during which he will take the exams. The exam, offered every semester, will consist of a six-hour written exam, with at least two, but no more than four, hours in the general area of mass communications in modern society. Two more exams (to be determined by the student in consultation with his adviser) in areas of history, mass media law, media economics, or areas of comparable importance and difficulty, complete the written portion of the exam. Within one week after passing the written portion, the student must pass an oral examination, administered by a committee of faculty who wrote the questions for the written examination. The exam, if failed, may be repeated no sooner than the next semester. A student who fails the entire exam (or some portion) must schedule his second attempt and pass the exam within one year of the end of the term during which he made his first attempt. A second failure will drop the student from the program.

Each student must prepare a research paper as proof of his ability to understand basic media research. The paper may be one written for a class; advance notice must be given to both the instructor and graduate adviser. If both agree, the instructor consents to supervise the preparation of the paper in a form acceptable to the Graduate School. Two copies will be prepared. The original copy goes to the Graduate School; the second copy is for the School of Journalism.

Doctor of Philosophy Degree

Minimum course requirements for the Ph.D. degree will include 64 semester hours beyond the bachelor's degree with at least 32 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 4.25 average on course work taken at SIU, and may be required to take extra work if any grades of C or lower are earned at SIU.

Each Ph.D. student will prepare a total program plan for the degree sometime during his second semester. 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 $\frac{2}{3}$ - $\frac{1}{3}$ 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 505 and 506 or Math 514 and 515 (Statistics)

Journalism 540 and History 561 or Political Science 538 (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 *B* or *A* 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.

Each student must pass a rigorous comprehensive examination after completing tool requirements and all course work (with all incomplete and deferred grades removed) and with a minimum 4.25 grade point average. The examination must be completed within one year after the student has satisfied all course and tool requirements. Failure to successfully complete the exam during the one-year period will result in dismissal from the program. The form and scope of the examination are at the discretion of the student's major professor and the examining committee, but ordinarily the test examines the student's grasp of research methodology, media problems, broad concepts relating to journalism, and nonjournalism area(s) of course study.

Each student prepares a dissertation proposal, defends and explains the proposal to his 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 committee. The dissertation must be based on scholarly research and independent thought.

Students must enroll for a minimum of 24 hours in Journalism 600, (dissertation). 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 and interested observers. Although others than committee members may ask questions of the student, the pass or fail decision on the oral will be made by committee members only.

Linguistics

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

Applicants for admission to either program, besides meeting the general conditions for admission to the Graduate School, must have an undergraduate average of at least 3.7 (on a 5.0 scale). In addition, students who are not native speakers of English must have a TOEFL score of at least 550. An undergraduate background or work experience in one of the following fields is desirable but not required: anthropology, English, foreign languages, mathematics, philosophy, psychology, sociology.

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 his progress, the type of assignment, etc. The purpose of these assignments is to expose the student to some of the types of activities that he will ultimately be engaged in after he receives his M.A. degree. Performance on these assignments is evaluated.

Toward the end of their coursework, students will take a written comprehensive examination covering the areas of their concentration. This examination may not be taken more than twice. All graduate work must be completed with an overall grade point average of 4.0.

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, formal language tests will be administered.

A thesis is required for the M.A. degree in linguistics. The student, in consultation with his departmental academic adviser, will select a chairman and two other faculty members to serve as his thesis committee; the executive committee of the department must approve 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 of the Department of Linguistics.

The total credit requirement is a minimum of 32 credit hours. Students are encouraged to attend the summer linguistic institute of the Linguistic Society of America; credit will be allowed for coursework 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
550a	Seminar in Linguistics (Syntax) or	
550b	Seminar in Linguistics (Phonology)	4
Thesis requirement:		
599	Thesis (minimum 3 hrs. maximum 6)	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 his adviser, the student should structure a coherent minor. Possible areas are psycholinguistics, sociolinguistics,

tics, 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 his 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 a student can demonstrate equivalent experience or academic credit for any of the above course requirements, he may substitute other appropriate courses 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 had an undergraduate concentration in English language or literature, or the equivalent in practical experience.

The curriculum is designed to give systematic work in both theoretical linguistics and applied linguistics (methodology of the teaching of English as a foreign language).

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 (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 undergraduate grammar courses (*i.e.* GSD 104). The purpose of these practice courses and practice teaching assignments is to expose the student to some of the types of teaching activities he will ultimately be engaged in after he receives his degree.

Required courses: (10 hours of EFL courses; 7 hours of linguistics courses)

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
401	General Linguistics	4
402a	Articulatory Phonetics	3

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 linguistics department offerings, or, in consultation with an adviser, courses in other departments which may be related to the student's program and interests.

Foreign language learner's experience:

All EFL students who are native speakers of English must have the equivalent of 1 semester of study of a modern language (including exotic languages) *within the preceding 3 years*. 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 1 semester of study of a modern language at SIU. Enrollment in an undergraduate-level course or for audit satisfies the requirement.

Foreign students, in recognition of their experience in learning English, are exempt from this requirement. They are strongly urged, however, to take an advanced English composition course in order to strengthen their control of written English.

A thesis is not required for the M.A. degree in English as a foreign language; the candidate must submit to the chairman a clean copy of a research paper (which has earned a grade of *A* or *B*) for submission to the Graduate School.

A certificate of attendance will be granted to those students who do not satisfy the grade point average (4.0) 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 his graduate program, as would be the case if he had a strong undergraduate major in mathematics or a well chosen minor in mathematics with a major in a related discipline.

He 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 he will be expected to remedy any deficiencies in his 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.
2. The candidate must include in his program 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 his 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 his 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 his program, the student must demonstrate satisfactory performance on an oral examination based on his course work and his 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 must include in his program 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 his 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 his 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 his course work and thesis and on an oral examination based on them given at the completion of his 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 he has demonstrated above average performance in graduate work 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. This 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 the 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. The candidate must pass an oral examination on his 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 4.25, and approval by the department.

The departmental graduate adviser will assist each student with the initial planning of his 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.

Participation in teaching, research, and other services is required of all graduate students (whether or not they are recipients of financial assistance) as a condition to receiving a graduate degree in microbiology. Any financial assistance is considered a grant and not as part-time employment.

Master's Degree

Each candidate for the master's degree is required to complete 30 semester hours of acceptable graduate credit and to submit an approved thesis. 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, 562, taken once.

The remaining credit hour requirements may be elected from 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.

A maximum of two credits in Microbiology 500 will be credited toward the master's degree. An additional two hours will be credited toward the doctoral degree.

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 his 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.

Doctor of Philosophy Degree

Each prospective candidate for the Ph.D. degree in microbiology is required to complete 96 semester hours of acceptable graduate credit including 24 hours of dissertation credit and the required statistics courses, pass the qualifying examinations, write and defend an acceptable dissertation based on a laboratory research problem, and spend at least two consecutive semesters in residence as a full-time student after admission to the doctoral program.

All students will be expected to complete a core of courses consisting of 403-2, 425-2, 2; 441-3; 451-3; 460-3; 462-2; 503-2; 540-3; 542-3; 562-2; 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 recommended to the Graduate School for candidacy for the doctorate.

The qualifying examination will consist of three parts, indicated below.

(a) Part 1: general microbiology: this examination will be constructed and graded by the entire faculty.

(b) Part 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.

(c) Part 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, the student must satisfy every member of the examining committee. If the student fails to do so, he will fall in one of three categories. (1) He may fail and be denied a re-examination. (2) He may fail and be given an opportunity to be re-examined after an interval of time agreed upon by the student and the chairman of the committee. (3) He 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:

- (a) The student and the chairman of the advisory committee determine the general nature of the research problem.
- (b) 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.
- (c) Periodic meetings of the student with his advisory committee are encouraged.
- (d) 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.

Molecular Science

Graduate work in molecular science may be taken as a major or minor leading to the Doctor of Philosophy degree. This program, an interdisciplinary program with a core in theoretical and applied physics, presently includes research in the areas of atomic-molecular physics, biophysics, crystallography, geochemistry, materials science, mathematical physics, molecular genetics, nuclear physics, and solid-state physics. It affords the student a unique opportunity to work with the research faculty and facilities in related areas throughout the University and to specialize, if he chooses, in problems embracing several academic disciplines. A molecular science committee appointed by the dean of the Graduate School from eligible graduate faculty members of the various interdisciplinary areas is a continuing body for overseeing and evaluating the program. The chairman of the molecular science committee administers the program, subject to the policies set forth by the molecular science committee, the Graduate Council, and the dean of the Graduate School.

At the present time students are not being accepted for this program.

Music

The School of Music offers programs leading to the Master of Music degree and to the Master of Music Education degree. In addition, a student enrolled in a program leading to a Ph.D. degree in education, with a concentration in secondary education, may select the elective portion of his program from the graduate courses offered in the School of Music.

Master of Music Degree

Concentrations are available in 1) music history and literature, 2) music theory and composition, 3) performance and 4) opera-music theater. Each degree requires a minimum total of 30 credits with a minimum total of 15 credits at the 500-level.

History-Literature. Majors must complete Music 501-2; 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; 4 elective credits in non-music history-literature courses.

Theory-Composition. Majors must complete Music 501-2; 502-4 (2, 2); 545-4 (2, 2); 3 credits from the 470 or 570 series; 480 or 580-4 (580 sequence 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 applied music.

Performance. Prior to admission, an applied major may audition in person to attain unconditional admission to the degree program, or to obtain conditional admission to the program, submit a tape recording of his performance. A student submitting tapes may be asked to appear for regular audition to attain unconditional status during his first term in residence. Until unconditional status is attained, he may be required to schedule applied music only at the 400 level. For detailed procedures, refer to the pamphlet of the particular area available from the coordinator of graduate studies in music.

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

Opera/Music Theater. Opera-music theater majors must have an undergraduate degree 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 must 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; or 595 and 598; or 599.

Master of Music Education

Majors must complete Music 501-2 or 503-2; 502 a or b-2; 4 credits from 509, 550 or 460; 8 credits selected from music education courses; 2 credits from 566, 414, 567 or 468; 6 credits elected from non-music education courses including at least one course from 410, 482, or the 470-570 series; 599-6 or approved electives in music or related fields.

General Information. Fees are not charged for individual instruction, practice rooms, or instrument lockers. Instruments are loaned where necessary, without charge. However, certain costs are involved in the purchase of music literature, textbooks, and other incidental supplies used in the various phases of instruction. These costs usually range from \$20.00 to \$50.00 per term.

Advisement. The coordinator of graduate studies in music serves as the official

adviser. After initial advisement, a major professor and a minor professor will be assigned to each candidate. The major professor will thereafter be responsible for preliminary advisement and thesis advisement, and will serve as chairman of the orals committee.

Proficiency examinations, used to validate minimum standards in undergraduate theory and music history-literature, will be administered at the beginning of the fall and summer terms and must be taken at the first opportunity after admission. Those passing the examinations may enroll without further conditions. If an examination is not passed, enrollment is limited to 400-level courses in that area until prescribed remedial work has been completed.

The Thesis, Document, and Research Paper. Depending upon the specialization, all master's degree candidates will complete (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. A reading of the thesis-composition should be tape-recorded; if this should be impractical, another of his compositions should be tape-recorded to illustrate his capabilities in composition.

Before extensive work is done on the thesis or document, the student must submit, on a form available in the music graduate office, his proposed title and organization, along with a bibliography of material available, to the coordinator of graduate studies in music for approval by the graduate committee. A statement by the major professor should be made on this application form indicating his reactions to the proposal and its acceptability.

The recital to be given by performance majors will be under the supervision of an appropriate applied jury consisting of at least three members. This group must give advance approval of the literature to be performed, pre-audition the performance, and judge the acceptability of the final performance.

Although the Master of Music Education degree does not require a thesis, the student may elect to write one, in which case procedures required of others writing a thesis shall apply; he will enroll in Music 599 for six hours credit. Those students working toward the Master of Music Education degree, if they do not elect to write a thesis, must complete six hours of course work, including research terminating with a paper or papers following thesis style. The research paper may be one done in connection with a graduate course which displays the student's capabilities of acceptable research techniques and reporting. Candidates must consult with the coordinator of graduate studies in music who will ascertain the acceptability of the paper.

The research paper requirements for the Master of Music degree in opera-music theater will be satisfied as described under the appropriate areas in the preceding paragraphs.

At least five weeks before the intended date of graduation, three copies of all theses, thesis-composition manuscripts and tapes, documents, and research papers must be submitted in final form, with approval by the major professor, to the music graduate office. Upon final approval by the coordinator of graduate studies, he will forward two copies to the Graduate School and retain one copy in the music graduate office.

Guidelines for preparing a thesis are available from the Graduate School. All copies of all materials may be carbons or clear, acceptable Xerox reproductions.

Comprehensive Examinations

During the terminal semester, after all proficiency examinations and any prescribed remedial work have been passed, the student will be given comprehensive examinations, written and/or oral, dealing with the general areas of music and his concentra-

tion and, when appropriate, his thesis or document. Application for the comprehensive examinations must be made not later than five weeks before the expected date of graduation, and they must be satisfactorily concluded not later than three weeks before graduation.

It should be noted that application for the comprehensive examinations may not be made until all other requirements, with the exception of terminal semester courses for the degree, have been satisfied. The orals committee is appointed at this time by the coordinator of graduate studies in music and will consist of the student's major professor as chairman, plus two or more faculty members representing the student's principal areas of concentration. The student may request faculty members who he feels are in a position to know his areas and strengths. 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.

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 this department.

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

Master's Degree

Required courses are: 485-3, 500-3, 501-3, and 541-3. The Master of Science in Education degree consists of 30 semester hours, including 2-6 hours of research paper. The Master of Science degree consists of 30 semester hours, including 3-6 hours of thesis (Occupational Education 599).

Programs of study are developed by the student and his adviser depending upon deficiencies, 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 concentration; no minor is required. Some areas of concentration are: teacher of industrial oriented health, or personal and public service occupations; coordinator of cooperative occupational education; and supervisor, director, or administrator of secondary, area vocational, community junior college, or other vocational-technical or occupational educational programs.

One-half or one-quarter time teaching or research assistantships, and fellowships are available to qualified applicants. Additional information about programs, courses, assistantships, and fellowships may be obtained from the chairman of the Department of Occupational Education.

Philosophy

The Department of Philosophy offers graduate work leading to the Master of Arts and the Doctor of Philosophy degrees in philosophy. Graduate courses in philosophy may be used as a minor for master's programs in other departments or to satisfy requirements for a teaching specialty in programs leading to the Master of Science in Education degree in secondary education or in higher education. Students who

do not plan to continue work in philosophy beyond the master's level are encouraged to elect a graduate minor or to combine philosophy with another subject in a double major.

The department expects an applicant for admission to its graduate program to have had at least 16 semester hours (24 quarter hours) of 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 credit requirement in favor of maturity and of quality and breadth of academic experience. The applicant will be required to make up serious background deficiencies by taking appropriate undergraduate philosophy courses without credit.

The applicant should request three individuals familiar with his work to send letters of recommendation to the director of graduate studies of the department.

For admission to the graduate program native English speaking applicants should submit with their application scores for the Graduate Record Examination Verbal and Quantitative Aptitude Tests. 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 upon the condition that he later submit acceptable scores.

Each new graduate student in the program is required to demonstrate competence in formal logic during his first year in 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.

The Master's Degree

The Department of Philosophy requires the candidate for a master's degree to present a thesis for which 6 hours of credit are allowed, and to complete a minimum of 24 additional hours of course work. He must pass two examinations: a written examination covering the nature and proffered solutions to the persistent problems of philosophy as dealt with by major philosophers from Thales to the present and an oral examination devoted chiefly to the thesis. In the written examination emphasis will be placed on such classical figures as Plato, Aristotle, Descartes, Spinoza, and Kant, but the student will be expected to answer questions involving at least two recent philosophers, one of whom will be an American.

A reading knowledge of one foreign language, usually French or German, must be demonstrated by passing the Doctor of Philosophy proficiency examination in that language, or by passing the appropriate 288b foreign language course with a grade of *B* or better.

Doctor of Philosophy Degree

At the time of his acceptance into the Ph.D. program the student will be assigned an advisory committee who will help him plan a program of study designed to prepare him for admission to candidacy. After the student has accumulated at least 24 hours of credit beyond the master's degree, and before he begins work on the dissertation, he must take a written preliminary examination on the thought of one major figure in the history of philosophy and in the following four areas: history of philosophy; logic, methodology, and philosophy of science; metaphysics and theory of knowledge; and value studies.

Before he is allowed to take the preliminary examination the student must have met the research tool requirement in one of the following ways; (1) demonstrating a reading knowledge of two foreign languages by examination or by passing the appropriate 288b language course with a grade of *B* or better; (2) showing an appropriately higher proficiency in one language; or (3) demonstrating a reading knowl-

edge of one foreign language and completing satisfactorily two or more courses at the graduate level in an outside area as approved by the student's committee.

After he has passed his language examinations and the preliminary examination and has completed 30 hours of work beyond the master's degree, the student will be recommended to the Graduate School for candidacy and assigned a doctoral dissertation committee which will supervise the research and writing leading to the dissertation. After the dissertation has been accepted by the committee, the student is given an oral examination on the dissertation and related topics.

The department has available each year a number of assistantships for qualified graduate students. Applications for these assistantships should be sent to the department before February 1 of the academic year preceding that for which the application is made. All graduate students in philosophy are expected to have some supervised experience in teaching elementary work in the field, either through the regular assistantships or through special assignments.

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 492 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.

Area of Concentration

1. 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 his adviser, designs a program which satisfies his special interest.
2. 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 his adviser, designs a program which satisfies his special interest.
3. 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

Graduate work in physics may be taken 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 520. 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. 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 an M.A. degree is required to pass an examination, written or oral or both, covering his 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 may be included in the minimum 15-hour

requirement of coursework 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 pass an examination, written or oral or both, covering his 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. He 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 his 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, com-

puter 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 and oral qualifying examination.

Ordinarily, the doctoral student should expect to spend a minimum of three years beyond the bachelor's degree or two years beyond the master's degree, in residence. He will be required to present an acceptable dissertation describing original research performed with minimal supervision and deemed by his graduate committee to be of such quality as to merit publication in the refereed literature of the field. A final oral examination will be held over the field of the dissertation.

Plant and Soil Science

The department offers courses leading to the Master of Science degree in plant and soil science with concentrations in the areas of crop, soil, and horticultural sciences. 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, no more than 10 credit hours of unstructured courses at the 500 level may be counted toward the degree. There is no foreign language requirement.

Minimal requirements for students entering the master's degree program involving a thesis are (a) meet departmental undergraduate requirements, and (b) minimal GPA of 3.70 ($A=5.0$). Students who do not meet the undergraduate requirements may correct these deficiencies while an unclassified student or elect the non-thesis option and complete at least 7 semester hours of undergraduate course work in plant and soil science with a grade of *B* or better, in addition to the 30 hours of graduate course work. Students entering the departmental graduate program with a GPA below 3.70 are accepted on a conditional basis and must enroll in 9 hours of structured courses at the 400-500 level during the first term, and make a 4.0 GPA or be dropped from the program.

It is customary to require supporting courses in botany, microbiology, chemistry, statistics, and other areas essential to a problem in the student's chosen field and to prepare him for acceptance for the Doctor of Philosophy degree if he has that potential. The supporting courses are selected on an individual basis by the student and approved at the discretion of the advisory committee. Once the general field has been selected, the research and thesis may be completed in any one of the many divisions of that field. In horticulture, for example, the research and thesis may be in vegetables, tree-fruits, small-fruits, ornamental plants, or turf management; in soils, the problem may relate to fertility, soil physics, soil microbiology, soil chemistry, or soil and water conservation; in field crops, the problem may be directed toward crop production and management, weeds and pest control, or plant breeding and genetics. Often two of these more restricted areas can be combined in one problem.

Each student, whether in the thesis or non-thesis option will be assigned a major professor to direct his program. The major professor will serve as chairman of the students' 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 his graduate work including the thesis or research paper.

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 candidates to emphasize such areas 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.

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 former teachers; (3) a letter of professional intent; (4) copies of all transcripts; and (5) scores on the Graduate Record Examination (GRE) verbal and quantitative tests (foreign students must submit GRE scores to be considered for assistantships and fellowships). The Personal and Professional Data Form and forms for applying for assistantships and fellowships may be obtained from the director of graduate studies.

In exceptional cases, the GRE may be waived as an admission requirement, but it must be taken at the first offering of the test after the student begins his or her first term of study. Applications and supporting materials should be submitted at least eight weeks before the term of registration. Those applying for teaching assistantships and/or fellowships should complete their applications by February 1. Departmental processing of applications for acceptance as a graduate student in political science is the joint responsibility of the director of graduate studies and the graduate studies committee.

Master of Arts Degree Requirements

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 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 3.7 (5-point scale) overall grade point average or, alternatively, have a 3.9 overall grade point average for the last two years of undergraduate work; and (4) have a 4.0 average in government or political science.

Applicants who meet the minimum standards of the Graduate School but do not meet departmental minimal requirements can be considered for acceptance only on petition to the Department's graduate studies committee. Acceptance may be accompanied by a statement specifying special conditions of admission.

The director of graduate studies serves as adviser to each new M.A. and Ph.D. graduate 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. Retention is governed by the standards of the Graduate School.

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 areas of study selected by the student from the following areas and fields of study and approved by the student's advisory committee:

Area A—Political Theory and Methodology

- (1) History of political theory
- (2) Normative political theory and analysis
- (3) Empirical political theory and theory-building
- (4) Research methods and techniques
- (5) Polimetrics
- (6) Didactics

Area B—American Government

- (1) Concepts, theory and methods
- (2) The legislative-executive process
- (3) Administrative decision-making and organizational behavior
- (4) Political behavior and the electoral process
- (5) Public policy (including foreign policy)
- (6) Psychology and politics
- (7) State, local, community and urban behavior and structures
- (8) Public law and judicial process

Area C—Comparative Government

- (1) Concepts, theory and methods
- (2) The political systems of foreign countries or areas
- (3) Processes and institutions, e.g., comparative political development, comparative political socialization, comparative administration, comparative political parties, comparative foreign policies, or other approved topic

Area D—International Relations

- (1) Concepts, theory and methods
- (2) International politics
- (3) International law
- (4) International organization
- (5) Linkages between foreign policy and international relations

Area E—Cognate and Interdisciplinary fields

- (1) An approved field, e.g., history, economics, mathematics or sociology
- (2) An approved set of related interdisciplinary courses, e.g., courses in organization and group behavior.

The three required areas of study may be complementary, e.g., courses in the processes of American government, comparative government and international relations. The assignment of a field to a particular area is not rigid. The student is allowed the greatest flexibility in field definition subject only to the approval of his or her advisory committee and the director of graduate studies.

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 either Political Science 501a or 501b, methods of empirical research. Proficiency in one tool, a modern language, statistics or computer science, is also required. The selection of a

tool and the appropriate research methods course must be justified to the student's advisory committee as being relevant to the proposed course of study and research and professional interests and approved by the director of graduate studies. The method demonstrating proficiency is the same as that 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 area requirements.

In addition to required course work, a thesis, internship report of thesis quality or two (acceptable) research papers are required. A student who chooses the two-research paper alternative must complete 30 hours of course work. A student must have an overall GPA of at least 4.0 ($A=5.0$), completed the tool requirements and selected a thesis or internship committee approved by the director of graduate studies before registering for thesis or internship credits (maximum of 6 semester hours). 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 and signed by the members of the student's thesis or internship committee and filed with the director of graduate studies. The student choosing to fulfill degree requirements by submitting two approved research papers can submit no more than three proposed research papers to the department's standing committee for evaluation.

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. The student's advisory committee will conduct the final oral examination when he or she chooses to fulfill degree requirements by submitting two research papers approved by the department's standing committee.

Copies of the thesis, internship report, or two research papers, current transcripts, and copies of the student's program description must be submitted to the student's thesis, internship or advisory committee members no later than 1 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 before the student's graduation application will be approved. Any 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, public affairs program, political science department. Application materials to be submitted are the same as those for other graduate degrees in the department except that Graduate Record Examination scores are not needed unless the applicant wishes to be considered for an assistantship or fellowship. The same time constraints apply in the application process. Applications are evaluated by the director, public affairs program, and the appropriate committee.

Requirements for admission are the same as those listed for the Master of Arts degree except that 24 quarter or 16 semester hours of undergraduate work in public administration, business administration, or other approved discipline is as acceptable as work in government or political science.

In instances where a candidate's promise is indicated by his professional experience rather than his undergraduate record, due consideration will be given on an

individual basis to conditional admission. If a candidate's undergraduate background is inadequate preparation for the specific graduate courses he is planning to take, it may be necessary for him 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 minimum requirements for the degree unless the student's advisory committee disapproves.

Retention is governed by the standards of the Graduate School.

Requirements for completing the degree are (1) satisfactory completion of core and area courses listed below; (2) completion of 30 semester hours of graduate credit, 15 of which must be on the 500 level, and (3) satisfactory performance in either a 10-week agency internship or a special study or research project. Core courses required of all candidates are advanced public administration, planning and budgeting systems, and advanced policy analysis.

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:

I. Theory (3 semester hours minimum)

Courses in management, organization, communications, or bureaucratic theory.

II. Techniques (6 semester hours minimum)

Courses in accounting, budgeting, finance, personnel administration, public relations, planning, geography, specialized writing, research design and methods, policy analysis, and systems and operations research.

III. Behavior and Institutions (6 semester hours minimum)

Courses in managerial and organizational behavior, administrative institutions and processes, American government and politics, public policy, economics, public finance, sociology and social change, and urban politics.

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., community development, computer science, correctional administration, educational administration, recreation, rehabilitation, social work, transportation and highway engineering, and water resources.

An advisory committee, whose members represent those units of the University contributing most to his program, will be approved for each student by the director of the program. This committee must approve the student's 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. 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 of the program. Candidates with one year or more of approved experience must undertake an approved special study or research project. For either the internship or project a written report must be prepared, in accordance with a prospectus approved by the student's advisory committee and filed with the director.

All candidates shall satisfactorily complete a final oral examination, conducted by the committee and open to the public. The examination will cover the student's written report, the major area in which it is written, and his general competence in the fields covered by his study. A copy of the approved written report must be filed with the director, public affairs, 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 of the program, and approved by members of the appropriate committee at a scheduled meeting.

Doctor of Philosophy Degree Requirements

In addition to the Graduate School's admission and program requirements, the department's rules in force at the time of the student's admission to the Ph.D. program will apply while he or she 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.

At least one year in residence after admission to the Ph.D. program (two semesters in each of which the student completes 9 hours or three courses) is required before taking preliminary examinations. The rules of the Graduate School determine retention.

The Ph.D. student must offer 6 fields of study selected from at least 4 of the areas listed in the above section on master of arts degree requirements. Four fields from not less than 3 areas of study will be satisfied by passing written preliminary examinations. Two fields will be satisfied by the completion of 6 semester hours of graduate course work (either 400 or 500 level courses) with at least a grade of *B*. Courses taken for the M.A. or M.P.A. program may be used to satisfy this requirement. One-half of all course work must be taken at the 500 level.

The student's program of study must be approved by the members of the advisory committee selected by him and approved by the director of graduate studies. The members of the advisory committee should represent the areas and the fields of study selected by the student. Successful completion of Political Science 501 a and b, two tools, an overall GPA of at least 4.5, the selection of an appropriate preliminary examination committee approved by the director of graduate studies, the submission of copies of current transcripts and brief description of the program of study to the student's preliminary examination committee members, and the approval of the student's preliminary examination committee and the director of graduate studies are also required before the preliminary examinations may be scheduled.

Tool. Each Ph.D. student must satisfy 2 tool requirements consisting of 2 foreign languages or any combination of 2 of the following: a foreign language, statistics, or computer science. The two tools selected must be justified to the student's advisory committee as being relevant to his program of study and research and professional interests and approved by the graduate studies director. Tool course work may not be counted as fulfilling the Ph.D. area or field course requirements.

A tool field may be offered as a preliminary examination field as long as (1) it does not contradict the area and field requirements specified above, (2) it does not cover the course work used to fulfill the tool requirement, (3) it is of a more advanced level of expertise than that assumed for the tool requirement (at least one more year of advanced course work), and (4) it is approved by the student's advisory committee. Language proficiency may be demonstrated by course work or examination.

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 (Arabic, Chinese, Vietnamese, etc.).

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.

Proficiency in computer science may be demonstrated by course work or examination or special problem. The student may take Computer Science 202 and an advanced course, e.g., advanced fortran, approved by the advisory committee members and the director of graduate studies. A grade of *B* or better is required in the advanced course, unless it is a 200- or 300-level course graded on a pass/fail basis, in which case a grade of *P* is required. An examination or a special problem assigned by a committee of faculty designated by the director of graduate studies can be substituted for the advanced course.

Statistics tool requirements can be fulfilled by taking Mathematics 514 & 515 or another second mathematics course approved by the student's advisory committee or by taking Guidance 505 and 506. In either case a grade of *B* must be earned in the second course. Proficiency in 1 or 2 statistics courses can be demonstrated by passing examinations administered by the mathematics department with a grade of *B*. Tool courses taken elsewhere may be submitted to the director of graduate studies for consideration as courses equivalent to those specified above.

A dissertation prospectus must be approved and signed by the members of the student's dissertation committee and filed with the director of graduate studies. The members of the dissertation committee may be different from those of the preliminary or advisory committees. The members of the dissertation committee selected by the student with the approval of the director will represent areas of specialization subsumed by the dissertation including a member from another department. The student must register for a minimum of 24 semester hours of dissertation credit.

The dissertation must be completed within 5 years following preliminary examinations, or the student will have to repeat preliminary examinations. Final copies of the dissertation, program descriptions and current transcripts must be submitted to the members of the dissertation committee no later than 10 days before the scheduled oral examination.

Upon completion of a dissertation of acceptable quality, 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 before the student's application for graduation will be approved.

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 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 him in academic matters, including the planning of his 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 his adviser, the student selects his 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 his tenure to facilitate the integration of his 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 towards careers in teaching and research. While the student may select courses from several areas, he 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 he 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 4.25 or above in graduate studies, and acceptance by the department. A

student who receives his 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 he has completed the statistics sequence, core requirements, and all of the preliminary examinations.

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: the clinical student may take his internship at any time after the completion of the M.A. In order to intern in his third year, he must have a master's thesis prospectus approved by the end of the fall semester of his second year. He will not be approved for internship unless this stipulation is met. Alternatively, he may opt to complete all academic requirements before he interns. 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.

The student is responsible, in consultation with his adviser, for scheduling and obtaining his internship. It is expected that the internship will be with an APA approved internship agency, unless an exception has been approved by the relevant area committee.

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 him to organize and integrate his 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 chairman. After preliminary discussion of a topic area with his proposed committee chairman and potential committee members, the student must meet with the director of his major area and present for final approval his request for the topic area and his examining committee (including additional examiners, if appropriate, and alternate readers).

The student must meet with his 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 his adequately prepared action. Any changes in topic area or composition of the committee must be approved by the

director of his major area. 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:

Experimental. Any one field from the following may be selected for the major examination: cognitive, developmental, learning, personality, physiological, quantitative, sensation-perception, social.

Clinical. The major examination includes the following: psychological assessment, psychotherapy, psychopathology, and personality. In addition, the examination reflects the specialization emphasis for each student.

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.

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 his minor preliminary examination and prior to passing his major preliminary examination. A student may not hold a prospectus meeting before he has successfully completed both his 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 chairman 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 chairman. 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 his 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 his 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 chairman

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 chairman 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 his 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, 1967 revision, Washington, D.C.).

General Procedures

A student should not register for 599 or 600 hours until he has a supervisor and will actually be using university facilities, or faculty time for assistance and direction. He must register each semester that he will be using university facilities or faculty time, whether or not he is in residence.

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 his thesis or dissertation to his 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 chairman, 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 his committee members on the day of his 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 his adviser. If the adviser agrees, the student submits a written

petition to his 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). If the course is not completed within the time limit, the *Inc.* is regarded by the department as indicating unsatisfactory performance in the course.

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 him of his 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 his evaluation and recommendations.

Public Affairs

(see Political Science for program descriptions)

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 incorporate 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, stu-

dents will be expected to have a minimum of 18 semester hours in photography, film studies, and/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 graduate study in public communications; and PVC 501, seminar in visual communications; and, as capstone, PVC 589, seminar in public communications in a dynamic society. A 4.0 grade point average (on a 5.0 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.

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, shall be required as agreed upon by the student's committee. This course will not qualify as meeting 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.

Thesis requirements may be satisfied by a written thesis or by creative work in the student's major field. The University reserves the right to retain a sample of each student's 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 thesis evaluation.

If he chooses the non-thesis option, the student must take the full 30 hours of course work. In lieu of a thesis, a student must submit an essay or research paper to the Graduate School as evidence of his ability to undertake formal research.

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.

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 an undergraduate degree in recreation or an allied field; (3) have a 3.7 (5-point scale) overall grade point average, or alternatively, a 3.9 overall for the last two years of undergraduate work; (4) have a 4.0 overall average in recreation or an allied field. Final acceptance will be decided by the graduate faculty.

Applicants who do not meet these minimal requirements or their equivalent, but do meet the minimum standards of the Graduate School, can be considered for acceptance only on petition to the department's graduate studies committee, which,

if granted, will be accompanied by a statement specifying the special conditions or requirements of admission.

The requirements may include four letters of recommendation as designated by the graduate faculty, a written examination, and other evaluative data as determined by such faculty.

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 4.0 (5-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 his adviser in designing a program to fit his needs for professional preparation in his 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, 540, 550, 560c, and 570; (2) nine hours of electives in an area of concentration; (3) Recreation 599-3, a thesis in recreation, or Recreation 596-3 to 6, independent study conducted in a recreation setting. Students choosing the 596 option are required to write a research paper.

Rehabilitation

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 practitioners, supervisors, and programmers in rehabilitation and welfare agencies. The overall program is left purposely broad and flexible to permit the inclusion of training innovations and emerging career patterns.

The Rehabilitation Institute offers graduate programs leading to a Master of Arts or a Master of Science degree in behavior modification, rehabilitation administration, and rehabilitation counseling. While rehabilitation administration 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 Master of Arts or Master of Science degree. Substantive courses in behavior analysis and in the application of behavioral techniques to specific populations and problems are offered. Most students will enroll in a first year course sequence which includes Rehabilitation 409, 503, 508, and 431. A program of study tailored to the interests of the individual student allows the student to concentrate on such areas as mental retardation, mental disorders, physically handicapped, child and school-related behavior, sexual behavior, and behavior therapy.

Practical experience (Rehab 594B) in a variety of field settings is a major part of the program. A 12 week full-time internship (Rehab 595) at an affiliated training center under the supervision of a member of the behavior modification faculty is also usually required. Comprehensive examinations are satisfied through oral examinations by the student's advisory committee.

Rehabilitation Administration

The rehabilitation administration program is designed to train students to serve as administrators, coordinators, supervisors, work evaluators, and programmers in a wide variety of rehabilitation settings. Several program emphases are available for concentration in such areas as rehabilitation facility administration, work evaluation and work adjustment, volunteer administration, placement and follow-up, and for assignment in community action programs, corrections, state-federal rehabilitation systems, developmental centers, and mental health units.

The requirements for the Master of Science degree include a minimum of 30 semester hours of courses/field work in addition to a full-time internship and a research paper.

Candidates are expected to demonstrate competencies in program planning and implementation, administration of service programs, staff development and supervision, and in the particular program content for the selected area of concentration. Specific course requirements are Rehabilitation 400, 570, 573, 576, and in most instances 594 and 595.

Select courses in the Departments of Accountancy and Administrative Sciences are also strongly recommended. Students with exceptional qualifications in certain areas may petition the faculty to waive any of the specifically listed requirements. Comprehensive examinations are satisfied through either oral or written examinations by the student's advisory committee.

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. 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. Concentrations 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

The Department of Secondary Education offers graduate programs leading to the Master of Science in Education degree in secondary education, to the Specialist degree in secondary education, and to a concentration in secondary education for the Doctor of Philosophy degree in education.

The Department of Secondary Education in cooperation with other academic units offers graduate work leading to the Master of Science in Education degree in secondary education with a concentration in adult education. Inquiries about this concentration should be directed to the coordinator of studies in adult education, College of Education, Southern Illinois University, Carbondale, Illinois 62901.

Master's Degree

This program is directed by a chief program adviser and is subject to review by the departmental faculty. Each candidate's program is planned through a secondary education adviser in cooperation with the department of the student's teaching field in those programs which involve a teaching specialty.

ADMISSION

Departmental application and recommendation forms must be completed before an adviser is assigned. These forms are available in the secondary education department office, 323 Wham Building.

Unconditional admission may be given when the:

1. Student has met certification requirements for teaching at the secondary level.
2. Grade point average is 3.7 or above (five point scale).
3. Courses in a certifiable subject field for secondary school are sufficient to constitute an acceptable teaching major.
4. Student has been admitted to the Graduate School.

Conditional admission may be given when the:

1. Student has not completed certification requirements.
2. Grade point average is between 3.40 and 3.70 (5 point scale).
3. Academic teaching field is deficient in hours or courses. Such deficiencies as are noted on the admission form must be removed as rapidly as possible.

ADVISEMENT

When the applicant has received notice of his admission to the master's degree program, he should contact the office of secondary education and make an appointment to meet with his adviser.

He and the adviser will outline his graduate program, set up a cumulative folder, and complete his first course request form.

In the event that the applicant cannot begin his program at the time indicated on the application, he should contact his adviser immediately. All students are

expected to begin formal course work within twelve months of the admission date. Failure to do so will necessitate reapplication for admission to the program.

PROGRAM OF STUDIES

A minimum of thirty semester hours is required for the Master of Science in Education degree. The student must successfully complete a minimum of 13 to 17 semester hours of graduate level work in education courses in those programs which involve a teaching area emphasis and 13 to 17 semester hours of graduate work in his teaching specialty. Special programs planned for those students whose previous experience or preparation and/or professional goals warrant special consideration must involve a total of 30 semester hours of graduate work as planned by the student's adviser in consultation with the student.

Required Core Courses

Secondary Education 508-Current Development in Selected Subject Areas in Secondary Schools—3 semester hours.

Secondary Education 562-Secondary School Curriculum—3 semester hours and the research courses:

Research Requirement

The research requirement for this degree may be completed as follows:

1. The student successfully completes Educational Administration 500 (research methods) or its equivalent during the first 15 semester hours of his work and then selects either of the following.

2. He enrolls in Secondary Education 593 for 2 semester hours or selects a thesis topic.

a. If he elects Secondary Education 593, he and the professor in charge of the research agree upon the research problem and determine the conditions for completing the study. When the study has been completed to the professor's satisfaction, one copy (original) will be sent to the Graduate School. A second copy will be filed with the adviser.

b. If he elects to meet the research requirement by preparing a thesis, he will be assigned a committee of three professors who will plan with him for the writing of the thesis. The committee will also serve as the examination team before whom the thesis is defended. The department will, upon approval, transmit the thesis to the Graduate School. Thesis credit up to 4 semester hours may be granted.

Comprehensive Examination. The comprehensive examination will be administered each spring and summer session and in other sessions by request. This two-part examination covers (1) the area of secondary education and (2) the student's teaching specialty or special area or concentration.

The student may elect to take the examination after completion of 21 semester hours of course work. In no case may the completion of this examination be later than five weeks prior to the expected date of graduation. Application forms for the examination are available in the departmental office, and must be filed with the adviser during the first two weeks of the session in which the examination is to be taken.

Program Completion. In addition to general Graduate School requirements described elsewhere in this catalog, and departmental requirements described in this section, the following schedule applies: A minimum of five weeks before the expected time of graduation the student:

(1) must apply for graduation at the Office of Admissions and Records.

(2) must have departmental approval of his completed research paper or thesis.

Note: Any exceptions to statements of policy or requirements made in this section must be cleared through the graduate committee of the Department of Secondary Education.

Sixth Year Specialist Program

The sixth year specialist program in the Department of Secondary Education is designed for teachers and other personnel in the secondary school who seek further specialization.

ADMISSION

Applicants who desire admission to the sixth year specialist program should possess a master's degree or its equivalent, two years of successful teaching experience, and a grade point of 4.25 ($A=5.0$) for previous graduate work. A graduate adviser for the sixth year specialist program is available for consultation in Wham 323. Application forms are also available.

At the time of acceptance into the program, an advisory committee of three professors will be appointed to design the program, supervise the field study, and administer the comprehensive examination at the conclusion of the field study.

PROGRAM OF STUDIES

A minimum of 30 semester hours credit including field work is required for completion of the program. At least 15 semester hours must be at the 500 level. A total of 60 semester hours beyond the bachelor's degree is required and must include at least 30 semester hours in secondary education.

Required Core of Courses:

3 semester hours in curriculum (may be satisfied by S. Ed. 511, S. Ed. 508, S. Ed. 562)

2 semester hours of seminar (may be satisfied by S. Ed. 566, S. Ed. 572, S. Ed. 597)

2-6 semester hours field work (may be satisfied by S. Ed. 596)

Electives. The remainder of the student's program shall be determined by the student and his committee.

FIELD STUDY

The candidate will complete a field study under the supervision of his committee.

The study will be presented and defended as an oral culminating examination for this program.

Upon successful completion the committee will transmit two copies of the study to the graduate school and certify the completion of the program of studies.

ADVISEMENT

The chairman of the student's advisory committee will assume the responsibility for completing Course Request Forms, maintaining up-to-date records of the student's progress, and conferring with other members of the advisory committee on any changes that may be needed in the student's program.

PROGRAM COMPLETION

In addition to the general requirements of the Graduate School as stated elsewhere in this bulletin, the following requirements must be met:

1. Committee approval of the field study
2. Successful oral examination over the field study
3. Application for graduation at the Office of Admissions and Records

4. Copies of the field study filed with the Graduate School and the departmental adviser.

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 4.0 for admission to the master's program and a minimum graduate grade point average of 4.5 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 his 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, he may request re-examination appropriate to his 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 4.5 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

Several areas of concentration are provided for advanced work beyond the master's program: theory-methodology (required of all students as a major area); social disorganization, deviance and control; social organization; social psychology; sociology of the family; and quantitative methods. There are no minimum course hours, specific course requirements, or research tools specified for the Ph.D.

The student must declare two major areas and two minor areas. Other special minor areas may be offered in special cases as student needs arise and faculty resources permit. One minor area may be chosen in any department other than sociology if the department offers a Ph.D. program and the student is able to demonstrate relevance of the outside minor to his total program. The student shall in this case meet requirements for the minor in the department involved.

A diagnostic examination is given in the fall and spring semesters and students are required to take this examination the first time it is offered following their entrance into the Ph.D. program.

In addition to formal course work the student is expected to qualify himself by independent reading in his major and minor areas. The student shall, with the assistance of his program committee, develop his own list of readings.

Before he can be recommended to the Graduate School for admission to candidacy, the student must pass a comprehensive written examination in his two major and two minor areas. Normally this consists of six hours of examination in each of the two major areas and three hours in each of the two minor areas. If the student elects a maximum area of theory-methodology, there will normally be a three-hour general examination and a six-hour examination in the student's area of theoretical emphasis.

The examination may, at the request of the student, be taken in two parts, each consisting of a major and minor area. The second part of the examination must be taken at the next regularly scheduled examination period. Failure to do so negates all examinations previously passed.

A student who fails to pass the examination in any of his declared fields must be re-examined at the next regularly scheduled time, in those areas in which he has failed. If he fails twice, he may be denied further examination by the chairman of the department.

On successful completion of the comprehensive examination, the director of graduate studies will recommend the student to the dean of the Graduate School for candidacy.

A dissertation is required for completion of the Ph.D. degree. After approval of the dissertation by the candidate's dissertation committee, an oral examination, primarily on the content and implications of the dissertation, is scheduled and conducted by the committee in open meeting.

Comprehensive Examinations

Comprehensive examinations are administered twice yearly, in late fall and late spring. A student intending to stand for examination should notify the chairman of the graduate examination committee of his intention during the first week of the term.

Sociology as a Minor

A student enrolled in another graduate program who wishes to minor in sociology 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 minor in sociology to his total program.

The student will be expected to stand comprehensive examination in the minor.

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.

Special Education

The department offers programs leading to the Master of Science in Education degree in special education, the Specialist 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 concentrations 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 3.7 on a 5 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 3.7 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 and/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.

Specialist Program

A sixth-year specialist program in special education is offered, with emphasis in one or more areas, including special education administration. The content of the program is designed to meet the needs of individual students, who are required to have teaching experience prior to entry into the program. Minimum grade point average requirements for entry are 3.7 minimum in the undergraduate degree and 4.0 in the master's degree.

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, Education.

Speech

Courses are offered in speech leading to the Master of Arts degree, the Master of Science degree and the Doctor of Philosophy degree in speech. The master's degree programs offer concentrations in interpersonal communication, interpretation, rhet-

oric and public address, speech education, language behavior, and general speech. Competence in one foreign language is required for the Master of Arts degree.

Courses in speech 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. The Doctor of Philosophy degree program is offered with concentrations in interpersonal communication, interpretation, rhetoric and public address, speech education, language behavior, and theater.

Applicants must meet the minimum requirements of the Graduate School and should have completed a minimum of 24 quarter or 16 semester hours in speech or related areas. A program for remedying deficiencies in background can be arranged upon petition to the graduate committee of the Department of Speech.

Application for admission to graduate study in speech should be directed to the Graduate School. In addition to material sent to the Graduate School, each applicant should submit to the Department of Speech three recommendations from former teachers and an application form indicating his professional and personal objectives. The official application forms for the supporting materials requested by the department may be obtained from the chairman of graduate studies, Department of Speech.

Acceptance for graduate study in speech and subsequent continuation in the graduate program are determined by the graduate committee of the Department of Speech.

Master's Degree Programs

A minimum of thirty semester hours of credit is required for the degree. At least sixteen of these hours must be at the 500 level. The course work may be in one or two specialties or in general speech.

A student who completes only the minimum of thirty hours of work may devote no more than eleven hours outside the Department of Speech. However, a student may petition the graduate committee for a program to include sixteen hours outside the department.

A faculty adviser is named for the individual student before the end of the first term in residence. The faculty adviser and the student will plan the program of study.

A student must have an overall 4.25 grade point average in order to be eligible for the master's degree.

The requirements for the master's degree may be met by either of the following plans:

Plan 1: Each student must complete a minimum of thirty hours of credit, with no more than six hours or fewer than three hours counted toward a thesis. 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. This committee must approve the prospectus and will administer the oral examination over the thesis and course work.

Plan 2: Each student must complete a minimum of thirty hours of course work. A research paper 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 selected by the student and adviser. This advisory committee must approve the research paper before it is submitted to the graduate committee and, finally, to the Graduate School for its permanent records. A comprehensive written examination is to be taken over the course work.

The student will be given a choice as to which of the above plans he wishes to pursue. The graduate committee of the Department of Speech will make the final recommendation for graduation.

Doctor of Philosophy Degree

The program should include at least twenty-one hours in the major area of competence and eleven hours in the minor area of competence. Major areas within the Department of Speech include: interpersonal communication, interpretation, rhetoric and public address, speech education, language behavior, and theater. The minor area of competence may be outside the Departments of Speech and Theater, but approval must be obtained from the student's advisory committee and the graduate committee. A student may petition to apply not more than five hours from a cognate area outside the Departments of Speech or Theater to his major area of competence. Total hours outside the department may not exceed sixteen. The proposed program must meet the Graduate School requirements for residency and shall exclude course work taken to meet the research tool and dissertation requirements.

After the student has completed sixteen semester hours of his program, his 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 tool requirements, etc.) for consideration in reaching the above decision.

The student must maintain a 4.5 grade point average in his major area of competence and a 4.25 average in his minor area of competence throughout his program of study. If the grade average in either area of competence drops below the minimum, the student is placed on academic warning for the following semester.

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 two professors from the major area of competence and one professor from the minor area of competence. The chairman 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.

Research Tool. Before admission to candidacy, the student must demonstrate competence in one research tool. This shall embody skills needed in understanding materials in the field or in the conduct of research for the dissertation or in continuing research contributions in his field of specialization.

Competency may be achieved in a language, statistics, computer programming, or, in some cases, by the completion of eleven hours of additional course work outside the Departments of Speech and Theater. Special cases may be considered upon petition to the graduate committee.

Eight hours of work in statistics taken within the University with an average grade of 4.0, plus the completion of a research project in the Departments of Speech and Theater, usually will be considered a demonstration of competency in statistics. In some cases, the final examination of the final term of the statistics sequence plus the research project will indicate the student's competency in statistics.

For the foreign language tool requirements, proficiency usually will be determined by an E.T.S. examination or the completion of the sequence of two language courses at Southern Illinois University at Carbondale designed for the research tool with a grade of *B* or better. Languages for which there are no E.T.S. examinations or for which there are no regular courses taught will be handled individually upon petition.

A research project which utilizes the language will complete the tool requirement.

Computer programming may be utilized when the student is interested in conducting quantitative research. This research may be for the dissertation or some other research project. Competency will be determined by the completion of a research project in the Departments of Speech and Theater.

In some cases, a student may satisfy the research tool requirement through the completion of eleven hours of additional course work outside the Departments of Speech or Theater but within the University. Such courses must comprise a unified approach to the study of a single area which can be demonstrated as necessary for the dissertation work. The courses must be approved by the graduate committee after the student's dissertation topic has been determined in conjunction with his advisory committee. A 4.0 average will be required for the courses. Final approval will be contingent on the successful completion of a preliminary research project germane to the dissertation topic, utilizing the courses selected to meet the tool requirement.

Preliminary Examinations. The student must pass preliminary examinations over the two areas of competence, the preparation and administration of which are determined by the advisory committee in consultation with the student. The examination may be taken after completion of the course work and prior to completion of the research tool requirement, upon unanimous approval of the advisory committee.

Dissertation. 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 proposal and pass upon the completed dissertation and oral examination.

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 special doctoral assistantships 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. The development of the new medical school at Southern Illinois University at Carbondale and the new dental school at Southern Illinois University at Edwardsville also holds promise for program enrichment. 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 (4.0 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

The student, after consultation with his academic adviser, is expected to propose to the graduate faculty of the department the academic program he intends 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, the student may request the preliminary examination. The preliminary examination shall be written and administered by no fewer than 5 graduate faculty members representing the student's concentration, cognate, and research interests. Should the student fail the first examination, he 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 that he is capable of 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 degrees in theater and to a concentration in theater for the Doctor of Philosophy degree in speech.

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, 8. cognate and interdisciplinary fields: dramatic literature, Asiatic theater, black studies, Soviet and East European theater, music theater, child drama, or an approved interdisciplinary group of courses. Child drama is a speech-theater interdisciplinary program which is a combination of creative dramatics and children's theater.

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 concentration and to demonstrate special competence in that field. Ph.D. students will also be expected to demonstrate competence in a cognate speech area: oral interpretation, interpersonal relations, rhetoric and public address, speech education, or language behavior.

After admission to the program, students are sent a required reading list of plays on which a diagnostic test (to determine for the student's benefit and the department's his weaknesses and strengths) is given during the first semester of residency. The test also requires the writing of an essay selected from a list of topics in the field.

Admission

Application for admission to graduate study in theater should be directed to the 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 study.

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 3.7 (5-point scale) overall grade point average, or alternatively, 3.9 overall for the last two years of undergradu-

ate 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.

In the child drama concentration the student takes normally 8 hours in each of the following: the Department of Theater, the Department of Speech and certain departments in the College of Education, and 6 hours in these or other departments.

Each candidate for a Master of Arts degree must include in his studies 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 4.0 (5-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 each student; he registers students in courses and helps them plan their programs. He also confers with the student 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 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.

He 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 student's concentration with directing students taking a course in acting; and a qualifying project consisting of a piece of creative work in his concentration 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 his 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; he must also satisfy the faculty that he is 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 can usually be determined after a student has taken 2-3 hours of courses in one of the above three areas (courses

taken in the core will count) and after he has demonstrated his ability in his specialty by submitting 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.

Students who do not qualify for admission to the M.F.A. program of studies may continue on a program leading to an alternate degree.

Once admitted as a candidate for the M.F.A., a student will complete 48 hours of courses (including 6 for the thesis and creative project in his 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 S.I.U. 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 S.I.U. 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 S.I.U.-Carbondale of their qualifications.

Doctor of Philosophy Degree

Potential doctoral students should carefully study the program description in speech.

For the degree of Doctor of Philosophy students are required (1) to complete a minimum of 20 hours in theater and 12 hours in one of the four areas of speech, and (2) to complete a dissertation in theater.

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 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 theater-speech areas.

Students in the Doctor of Philosophy degree program who have a special interest in dramatic literature may, upon approval from their adviser, earn the degree by substituting for theater courses a limited number of courses in dramatic literature as offered in the Department of English.

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.

Zoology

Programs leading to the Master of Arts, the Master of Science, and the Doctor of Philosophy degrees in zoology are offered by the Department of Zoology.

Master's Degree

Admission to the Master of Arts and Master of Science degree programs requires an undergraduate degree with at least 24 semester hours of credit in zoology. Credit in physical sciences and mathematics is also required. Any deficiencies which exist in undergraduate preparation must be removed concurrently with graduate work. Scores from the aptitude test of the Graduate Record Examination are required for admission.

For the Master of Arts degree, a minimum of 30 semester hours of credit are required, including 6 hours of research and thesis and 8 hours in a minor area outside of zoology. Reading knowledge in a foreign language as demonstrated by ETS examination or FL 288b with grade of *B* or better is also required. An approved thesis must be presented to the Graduate School to complete requirements for this degree.

Requirements for the Master of Science degree are a minimum of 33 semester hours, including a course in basic statistics and 8 hours in a minor area outside zoology. A research paper, which may incorporate 0-2 hours of special research (Zool. 593), is to be presented in lieu of a thesis to complete the requirements for the M.S. Degree.

Doctor of Philosophy Degree

The doctoral degree is a research-oriented degree awarded for high accomplishment in a particular discipline or interdisciplinary area. Admission to the doctoral degree program in zoology ordinarily requires previous training in animal science. A good background in all life sciences, chemistry, mathematics, and physics is desirable. Each student's program of study is based upon the results of an advisory examination, the student's overall background, the requirements of the preliminary examination, and the proposed concentration. The student's adviser aids in the selection of a minor and establishes the program requirement. A dissertation demonstrating scholarly merit and the ability to perform independent research are required.

Questions concerning individual situations for admissions or degree requirements should be directed to the departmental director of graduate studies.

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	Thermal and Environmental Engineering	Linguistics
Agricultural Industries	Engineering Biophysics	Mathematics
Animal Industries	Engineering Technology	Medical Education
Anthropology	English	Preparation
Art	Family Economics and Management	Microbiology
Biology	Food and Nutrition	Molecular Science
Black American Studies	Foreign Languages and Literatures	Music
Botany	Classical Studies	Occupational Education
Business Administration	French	Philosophy
Accountancy	German	Physical Education
Administrative Sciences	Greek	Physics
Finance	Latin	Physiology
Marketing	Romance Philology	Plant and Soil Science
Business Education	Russian	Political Science
Chemistry and Biochemistry	Spanish	Psychology
Child and Family	Forestry	Public Visual Communications
Cinema and Photography	Geography	Radio-Television
Clothing and Textiles	Geology	Recreation
Community Development	Guidance and Educational Psychology	Rehabilitation
Computer Science	Health Education	Religious Studies
Design	Higher Education	Secondary Education
Economics	History	Social Welfare
Education	Home Economics Education	Sociology
Educational Administration and Foundation	Industrial Technology	Special Education
Elementary Education	Instructional Materials	Speech
Engineering	Interior Design	Speech Pathology and Audiology
Electrical Sciences and Systems Engineering	Journalism	Theater
Engineering Mechanics and Materials		Zoology

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, Carbondale, Illinois 62901.

Administration of Justice

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: 200 and 201 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 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.

474-3 Law Enforcement Administration. Study of the organizational patterns, administrative problems, community issues, and internal role systems of American police agencies. Prerequisite: 200 and 201 or consent of instructor.

485-3 Corrections and the Community. Traditional correctional functions are re-defined 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.

501-3 Criminal Behavior: The Offender. Study of the theories concentrating on behavior of the individual as relevant to criminology and criminological practice; special emphasis on multidisciplinary applications. Prerequisite: consent of instructor.

502-3 Criminal Behavior as Group Member. Study of theories focusing on man as a sociocultural creature as applicable to criminology and criminological practice; special emphasis on multidisciplinary implications. Prerequisite: consent of instructor.

503-3 Criminal Behavior—Legal Aspects. A study of offender behavior, from historical and analytical viewpoints, as dealt with by the common law. Includes insanity as a defense, mental competency to stand trial and the problems of dealing with juveniles.

572-3 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 problems 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 217 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. Methods of progressively improving such markets. Prerequisite: 204 or equivalent. Elective Pass/Fail.

450-3 Advanced Farm Management. 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: 360 or equivalent.

461-3 Agriculture Business Management. Functions of top management in agri-business, 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: 360. Elective Pass/Fail.

462B-1 Agricultural Marketing Problems and Practices—Field Crops. Problems and their solutions in marketing field crops. Prerequisite: 360. Elective Pass/Fail.

462C-1 Agricultural Marketing Problems and Practices—Dairy and Poultry. Problems and their solutions in marketing dairy and poultry products. Prerequisite: 360. 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: 360. Elective Pass/Fail.

472-2 Agricultural Tractors and Engines. The principles of selection, operation, maintenance, and mechanics of tractors and other agricultural internal combustion engines. Prerequisite: 379.

473-2 Advanced Agricultural Electricity. Application of electricity to agricultural problems. An emphasis on principles of electrical distribution on the farm and the agri-business operation. Planning the efficient usage of electrical machinery and a study of component 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 drawings 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.

485-3 Principles and Philosophies of Vocational and Technical Education. (See Occupational Education 485.)

500-3 Agricultural Industries Research Methodology. Social science research methodology in agriculture. To include types of research problems encountered, sources of data, problems in developing new data, and methods of analysis. Prerequisite: consent of chairman.

525-3 Cooperative Vocational-Technical Education. (See Occupational Education 525.)

550-3 Resource Allocation in Agriculture. A theoretical and empirical examination of the effects of recent rural programs and policies on resource allocation in agriculture. Prerequisite: eight hours of agricultural economics or economics.

560-2 Advanced Agricultural Prices. Continuation of analysis of factors affecting agricultural prices; the application of these factors in price prediction. Prerequisite: 460.

562-3 Advanced Agricultural Marketing. Current complex problems in agricultural marketing and methods of developing solutions; cooperative activities. Prerequisite: eight hours of agricultural economics or economics.

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.

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. Feed quality control-laboratory procedures for nutrient determinations used in animal feed quality control. Prerequisite: 315.

415-3 Monogastric Nutrition. Advanced principles and practices involved in meeting nutrient requirements of monogastric animals. Prerequisite: 315.

416-2 Ruminant Nutrition. Practical knowledge gained of problems associated with digestion, absorption, and metabolism of nutrients as related to domestic ruminants. Prerequisite: 315 or consent of instructor.

419-3 Stable Management and Horsemanship. Laboratory experience in routines of horse care, training, and management. Field trips. 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.

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. 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. Elective Pass/Fail.

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: GSA 208 and Chemistry 140B or equivalent.

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. Breeding, feeding, and management of cattle. Field trip. Prerequisite: 315 and 332 or consent of instructor.

489-2 Behavioral Manipulation of Animals. Applied aspects of animal behavior with emphasis on domesticated animals. Prerequisite: GSA 209 or consent of instructor. Elective Pass/Fail.

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 Readings in Animal Industries. Readings 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 Anthropology-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 or consent of instructor.

400B-3 Current Problems in Anthropology-Linguistic Anthropology. Presentation and discussion of ongoing developments in theory and methodology in linguistic anthropology. Prerequisite: 300B.

400C-3 Current Problems in Anthropology-Archaeology. Detailed consideration of various aspects of current directions in archaeological method and theory. Prerequisite: 300C or consent of department.

400D-3 Current Problems in Anthropology-Socio-Cultural Anthropology. A survey of current problems in the description and analysis of non-Western social systems. Emphasis is on kinship and social structure. Prerequisite: 300D.

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: 300D.

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. Prerequisite: GSB 104 or equivalent.

405-3 Art and Anthropology. The nature of art, its locus in culture, its integration in society as exemplified in world cultures. Prerequisite: GSB 104 or equivalent.

407-3 Advanced Comparative Ethnology. Emphasis on utilization of the Human Relations Area Files, Morris Library, for comparative analysis of a wide variety of societal institutions. Ethnohistorical studies are also treated.

409A-3 History of Anthropology-Physical Anthropology. The history of physical anthropology, with particular emphasis on the impact of nationalism, personality and social attitudes. Prerequisite: none, GSB 104 recommended.

409B-3 History of Anthropology-Linguistic Anthropology. A survey of the history of anthropological linguistics with emphasis on anthropological contributions to the discipline and the historical development of specialized anthropological fields such as ethnosemantics, field techniques in language description, linguistic prehistory and other topics.

409C-3 History of Anthropology-Archaeology. An examination of the origin of scientific archaeology with emphasis on its development within the broader framework of anthropology. Stress will be given to anthropological archaeology, although the development of archaeology in the humanities will also be considered. Prerequisite: 300C or 400C or consent of department.

409D-3 History of Anthropology-Socio-Cultural Anthropology. The development of anthropological thought from the Age of Discovery to the present. The emphasis will be on an examination of the intellectual milieu which fostered general and specific conceptual views and methodologies. Prerequisite: junior standing and introductory course in anthropology or permission of instructor.

410A-3 Advanced Topics in Socio-Cultural Anthropology-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.

410B-3 Advanced Topics in Socio-Cultural Anthropology-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.

410C-3 Advanced Topics in Socio-Cultural Anthropology-Economic Anthropology. The study of non-Western economic systems.

410D-3 Advanced Topics in Socio-Cultural Anthropology-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: GSB 104 or equivalent.

410E-3 Advanced Topics in Socio-Cultural Anthropology-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.

410F-3 Advanced Topics in Socio-Cultural Anthropology-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: GSB 104 or equivalent.

410G-3 Advanced Topics in Socio-Cultural Anthropology-Cross-Cultural Studies of Personality. Similarities and differences in personality structures cross-culturally including the historical development of this as an anthropological subdiscipline.

410H-3 Advanced Topics in Socio-Cultural Anthropology-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 Advanced Topics of Socio-Cultural Anthropology-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 Advanced Topics in Socio-Cultural Anthropology-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.

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.

430-3 to 9 (3 per topic) Advanced Studies in Regional Archaeology. Detailed study of the early cultures of specific world areas. Emphasis on the evolutionary cultural development of an area. Can be repeated to a total of nine credits if course involves different area. Prerequisite: 400C or consent of department.

440-3 Advanced Studies in Physical Anthropology. Hominid paleontology, human variation, anthropological genetics. Advanced analysis and discussion of the fossil evidence for human evolution, race, and human individual and population genetics. Prerequisite: 300A or consent of instructor.

450-2 to 6 (2 per topic) Museum Studies. (a) Methodology and Display (b) Preparatorship (c) Administration. The philosophical and educational aspects of museum administration, display, processing, cataloguing, and preservation. Prerequisite: junior standing.

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.

510-2 to 6 (2 to 3 per topic) Seminar in New World Archaeology. From year to year, the areal and topical coverage of this course will vary, as will the instructors. Students should consult the department about subjects to be covered.

511-2 to 6 (2 to 3 per topic) Seminar in Meso-American Archaeology. From year to year, the areal and topical coverage of this course will vary, as will the instructors. Students should consult the department about subjects to be covered.

512-2 to 6 (2 to 3 per topic) Seminar in Old World Archaeology. From year to year, the areal and topical coverage of this course will vary, as will the instructors. Students should consult the department about subjects to be covered.

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 the instructors. Students should consult the department about subjects to be covered.

521-2 to 6 (2 to 3 per topic) Seminar in Ethnology of Meso-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.

550-2 to 6 (2 to 3 per topic) Seminar in the Native Cultures 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.

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.

575-2 to 6 (2 to 3 per topic) Seminar in the Individual and Culture. 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.

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.

582-1 to 12 (1 to 3 per semester) Problems in Archaeology. Guided research upon archaeological problems, to be arranged with department. Graded *S/U* only.

584-1 to 12 (1 to 3 per semester) Problems in Cultural Anthropology. Guided research upon problems in ethnology, social anthropology and linguistics, to be arranged with department. Graded *S/U* only.

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.

595-4 (2,2) Field Methods in Ethnology. (a) Stresses field methods in ethnology, including anthropological methods of inquiry and documentation of culture and habitat together with appropriate instruction in the techniques 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 (1 to 6 per semester) 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—all 300-level course offerings in the student's major discipline. 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—all 300 level course offerings in the student's major discipline. 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—all 300 level course offerings in the student's major discipline. 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—all 300 level course offerings in the student's major discipline. 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—all 300 level course offerings in the student's major discipline. 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—all 300 level course offerings in the student's major discipline. Graduates—consent of major adviser in appropriate art discipline.

406-2 to 16 Weaving 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—all 300 level course offerings in the student's major discipline. Graduates—consent of major adviser in appropriate art discipline.

407-3 19th Century Art. Painting, sculpture, and architecture in Europe from the French Revolution to the *Fin de Siecle*.

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 questions, 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.

417-3 20th Century Art to World War II. Painting, sculpture, and architecture in Europe from the turn of the Century to 1945.

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.

427-3 Art Since 1945. Painting, sculpture, and architecture since World War II. Main emphasis 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 pre-school, elementary education, early childhood and special education. Incidental expenses will be at least \$20.00. Prerequisite: 348a.

437-3 Esthetics of the Visual Arts. General survey of historical and contemporary philosophies of the beautiful with particular emphasis upon their application to visual works of art.

447-3 Museology. A survey of museum and gallery techniques. Prerequisite: restricted to art majors.

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 Weaving 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.

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).

Black American Studies

There is no 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 department.

445-3 Race and Politics in the United States. (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. Analysis of the "The Black Experience" directed toward practical contributions in the area studied. Topics vary with instructor. May be repeated once for a total of eight credits provided registrations cover different topics. Topics announced in advance. Prerequisite: GSB 109 or consent of department.

490-1 to 3 Cross-Cultural Rehabilitation. (See Rehabilitation 419.) Not for graduate credit.

499-3 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.

Botany

For all field courses in botany, students will be assessed a transportation fee.

- 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: 200 and 201.
- 406-3 Bryology.** Structure, development, and relationships of the liverworts, hornworts, and mosses. Two lectures and one laboratory per week. Prerequisite: 204.
- 410-3 Taxonomy and Ecology of Bryophytes and Lichens.** Floristic studies of the moss, liverwort, hornwort, and lichen communities of southern Illinois. Spring semester of odd-numbered years. Prerequisite: 200 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 pursuance 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, section techniques, and use of general and histochemical stains stressed. Includes chromosome squashing, whole-mount preparation, photomicrography, and other techniques. Two lectures and two laboratories per week. Prerequisite: 200.
- 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. Prerequisite: 304 and Biology 307 and consent of instructor.
- 443-4 Forest Ecology.** Physiology and autecology of forest and shrubland species. Growth and development of woody plants in relation to climatic, edaphic, pyric, and other environmental forces as exemplified in laboratory and field studies. Prerequisite: Biology 307 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 distribution models. Laboratory will include the application of these concepts and methods to field situations. Prerequisite: Biology 307 and consent of instructor.
- 446-8 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.
- 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: \$80.00. Prerequisite: advanced standing in one of the biological sciences 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 consent of instructor.
- 450-2 Plant Geography.** World distribution of plants related to environmental, floristic, and historical factors. Prerequisite: consent of instructor.
- 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. Prerequisite: consent of instructor, or major in botany, plant and soil science, or forestry.

- 457-3 Forest Pathology.** A study of the nature and control of tree diseases in forests, parks, streets, and nurseries. Fungal diseases are stressed. Three lectures per week. Prerequisite: consent of instructor or major in botany, forestry, or plant and soil science.
- 462-4 Science Process and Concepts for Teachers of Grades N-8.** (Same as Elementary Education 442.) Specifically designed to develop those cognitive processes and concepts needed by elementary school teachers in the teaching of modern science programs; e.g., SAPA, ESS, SCIS. Three lectures and one two-hour laboratory per week. One or two additional field trips required. Prerequisite: teacher education or consent of instructor.
- 484-3 Palynology.** (See Geology 484.)
- 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 the 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.
- 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 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.
- 543-3 Experimental Ecology.** Individual or shared studies of plant responses to selected environmental factors. Introduction to research methods including design of experiments. Prerequisite: equivalent of minor in biology or a biological science or consent of instructor.
- 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 Seminar.** One hour discussion of current topics in biology. Every semester.
- 581-1 Ecology Seminar.** Student discussions and presentations concerning various classical, contemporary, and controversial ecological topics. 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

Courses in this listing require admission to the M.B.A. program or permission of the assistant 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 dimensions, inter-relationships, and requirements. Prerequisite: enrollment in MBA program or consent of instructor.

510-3 Managerial Accounting and Control. Relationship of accounting to the functions of production, finance, and distribution: emphasis is given to the usefulness of accounting in administering and controlling an enterprise. Prerequisite: enrollment in MBA program or consent of instructor.

511-3 Accounting Theory. Contemporary advanced accounting theory, including controversial issues with emphasis on new income determination and asset valuation; particular attention given to current publication 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 Controllership. Function of controllership in a business organization; analysis of the duties and responsibilities of a controller; contribution of a controller 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. Review of recent developments and current trends in personnel administration based on a review and evaluation of the present state of the literature. 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: 541 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 multi-product 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 202.

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 202.

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. Prerequisite: outstanding record in accounting and recommendation of the departmental committee on internship.

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 Personal Adjustment to Business. 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. 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 adaption of the organization to a changing environment. Prerequisite: 341 or consent of instructor. Elective Pass/Fail.

453-3 Management Science II. A continuation of 352. Mathematical model building in business and solution techniques commonly used to solve such models. Topical coverage includes sequencing and scheduling algorithms, PERT, queuing models, Markov chains, simulation and decision theory. Prerequisite: 352. Elective Pass/Fail.

456-3 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: 341, 345. Elective Pass/Fail.

457-3 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: 456. 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 instructor. 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. Elective Pass/Fail.

480-3 Problems in Labor Law. Social, economic, and legal evaluations of recent labor problems, court decisions, and legislation. Concern is on long-run legislative impact on manpower planning, dispute settlement, and utilization of employment resources. Prerequisite: 385 or consent of instructor. 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, 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. Prerequisite: 318. Elective Pass/Fail.

485-3 Advanced Human Resources Administration. 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 methods of maximizing the utility of an organization's human resources. Prerequisite: 385 or consent of instructor. Elective Pass/Fail.

489-12 (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) Quantitative Methods. 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.

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.

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.

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.

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.

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.

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.

499-3 to 6 (3, 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: approval of the department chairman in the semester prior to enrollment.

Business Education

400-2 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.

409-2 Teaching Distributive Education. For those who plan to become teacher-coordinators of vocational cooperative or in-school distributive education programs. Emphasis on the planning of 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 305 and 363 or equivalent.

410-2 Teaching Consumer Education. Principles of teaching consumer education in secondary schools and junior colleges. Emphasis on meeting the 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 an evaluation program. Prerequisite: GSB 346 or Finance 305 or equivalent.

411-1 to 4 Workshop in Business Education. Major issues in business teacher education. Ordinarily offered from one to four weeks of the summer session.

412-2 Teaching Data Processing. Instructional methods and materials for, and the evaluation of pupil progress in, data processing. Prerequisite: 317 or Electronic Data Processing 101 or equivalent.

414-4 Organization and Administration of Project Plan and Cooperative Vocational Business Education. Project plan and cooperative vocational business education programs. Philosophy and objectives of cooperative vocational programs, methods of selecting students and work stations, placing and coordinating students in supervised cooperative work stations. Preparation of instructional materials, job analysis, conducting related information classes, evaluating workers and work stations, advisory committees, public relations aspects of cooperative programs. Prerequisite: consent of instructor.

415-3 Supervised Business Experience and Related Study. Designed to prepare teachers and coordinators in accordance with the requirements of the Illinois State Plan for the Administration of Vocational Education. Classroom study of the principles and problems of coordinating in-school or cooperative vocational business education programs; supervised occupational experiences; weekly reports from supervised training stations; classroom analysis and evaluation of on-the-job experiences of the members of the class in relation to their future work as coordinators and vocational teachers. Prerequisite: consent of instructor.

426-2 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.

427-2 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.

485-3 Principles and Philosophies of Vocational and Technical Education. Team teaching used. Nature and purposes of practical arts, vocational and technical education, their relationships and differences, and the place of each in preparing people for the world of work.

500-2 Research in Business Education. A study of research findings and techniques as exhibited in representative investigations in business education. Emphasis on reading and interpreting research, using research findings in solving instructional problems, and uncovering potential topics for future research.

503-2 Tests and Measurements in Business Education. The selection, construction, administration, and interpretation of tests and test scores in business education subjects. Principal emphasis on teacher-made tests, especially of the performance type, with secondary attention on published tests in the field.

508-2 Administration and Supervision in Business Education. History and philosophy of administration and supervision in business education with consideration of problems arising at local, state, and national levels and at secondary, college, and university levels. Supervisory problems include curriculum construction and evaluation, classroom supervision, promotional policies, selection of textbooks, purchase and maintenance of equipment, physical arrangements, and other areas according to needs of students.

509-2 Improvement of Instruction in Consumer and General 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.

510-2 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: 351 or 352 or 354.

525-3 Cooperative Vocational-Technical Education. (Same as Agricultural Industries 525, Home Economics Education 525, and Occupational Education 525.) Team taught. Interrelated cooperative programs as they are developed in America, (especially Illinois) are presented. Coordinators' duties and responsibilities along with the operation of interrelated vocational cooperative programs are featured. Prerequisite: student teaching.

590-1 to 4 Readings in Business Education. Supervised readings in selected subjects. Prerequisite: consent of instructor.

593-2 to 4 Individual Research in Business Education. Selection and investigation of a problem; use of relevant sources and techniques; collection, analysis, evaluation, and interpretation of data; and the writing of a report of the investigation. Prerequisite: consent of instructor.

599-1 to 6 Thesis.

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: 462a, 463a; 462b or concurrent enrollment, 463b or concurrent enrollment.

412-2 Inorganic Preparations. A study of some major techniques of inorganic syntheses. Six hours of laboratory per week. Prerequisite: 226 and 347 or 349.

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

431-4 Applied 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.

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.

435-3 Analytical Spectroscopic Characterizations. Spectroscopic methods for the study of molecules, especially including electron spectroscopy, mass spectrometry, and electron-spin-resonance spectroscopy. Three lectures per week. Prerequisite: 434 or equivalent, or consent of instructor.

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.

438-3 Review of Analytical Chemistry. A discussion of principles of chemical equilibrium, and theory and practice of analytical separations and of common chemical and modern instrumental measurements; designed for graduate students to remedy their deficiencies in undergraduate analytical chemistry. Three lectures per week. Prerequisite: 226 or equivalent, 434 or equivalent, graduate standing, and 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.

448-2 Mechanisms and Syntheses in Organic Chemistry. Examination of the fundamental mechanisms and syntheses of organic chemistry. Prerequisite: one year of organic chemistry and graduate standing.

450-3 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 in biochemistry. Three lectures 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. Prerequisite: one year of organic chemistry.

455-8 (4, 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. (a) Prerequisite: 451a, 226 or concurrent enrollment; (b) Prerequisite: 451b and 455a; or concurrent enrollment.

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 150b.

462-6 (3, 3) Physical Chemistry. Three lectures per week. (a) Thermodynamics and its applications. Prerequisite: 226, Mathematics 252b; concurrent enrollment in 463a; Mathematics 305a,b recommended. (b) Quantum mechanics of atoms and molecules. Prerequisite: 226, Mathematics 252b; concurrent enrollment in 463b; Mathematics 305a,b and Mathematics 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. One three-hour laboratory and one hour of laboratory-lecture per week. (a) Prerequisite: 226, Mathematics 225b; concurrent enrollment in 462b; Mathematics 305a,b recommended. (b) Prerequisite: 463a; concurrent enrollment in 462a; Mathematics 305 a,b and 406 recommended.

465-3 Statistical Thermodynamics and Kinetics. An advanced elective course in the above topics. Three lectures per week. Prerequisite: 462a,b.

468-3 Elements of Physical Chemistry. Open only to graduate students in chemistry whose diagnostic examinations indicate a need for this course. Prerequisite: one year of undergraduate physical chemistry.

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. Topic to be announced by the department. Prerequisite: consent of instructor.

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.

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 4.0 grade point average, five semesters of chemistry laboratory including one semester of physical chemistry, consent of instructor and department chairman.

511-6 (3, 3) Advanced Inorganic Chemistry. A theoretical and empirical treatment of chemical bonding and molecular structure followed by a systematic treatment of physical inorganic chemistry based on the principles developed. Three lectures per week. Prerequisite: one year of physical chemistry. 411 or satisfactory Field Examination in Inorganic Chemistry or consent of instructor.

519-2 to 9 (2 to 3 per semester) Advanced Topics in Inorganic Chemistry. 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, or satisfactory Field Examination in Analytical Chemistry.

532-3 Analytical Chemistry Instrumentation. Theories of design and methods of interfacing components of instruments with applications to optimization of systems for determinations of chemicals in trace concentrations. Two lectures and one three-hour laboratory per week. Prerequisite: 434 or satisfactory Field Examination in Analytical Chemistry.

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 ESR, NMR, and IR. Three lectures per week. Prerequisite: 434 or satisfactory Field Examination in Analytical Chemistry.

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 or satisfactory Field Examination in Analytical Chemistry.

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. Prerequisite: 448 or satisfactory Field Examination in Organic Chemistry.

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.

556-9 (3, 3, 3) Advanced Biochemistry. (a) Physical biochemistry-thermodynamics and kinetics of enzyme systems. (b) Protein structure, function and evolution. (c) Nucleic acid structure and function. Three lectures per week. Prerequisite: (a) 451a, b or equivalent and one semester of physical chemistry. (b, c) 451a, b or equivalent.

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: 465 or consent of instructor.

564-3 Statistical Thermodynamics. Elements of statistical mechanics and application to relatively simple systems. Three lectures per week. Prerequisite: 465 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 five fields of chemistry with individual instruction by a staff member. (a) Analytical, (b) Biochemistry, (c) Inorganic, (d) Organic, (e) Physical. 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.

598-1 to 50 (1 to 12 per semester) Research. Maximum credit 50 hours, except by permission of the student's graduate advisory committee. 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.

Child and Family

Graduate work in the Department of Child and Family is offered toward a concentration for the Master of Science degree in home economics.

408-1 to 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 Philosophy, History, and Administration of Pre-Kindergarten Programs. Planning and organizing programs for preschool or residential facilities including budgeting, staffing, programming, and evaluation. Prerequisite: 345A and 345B or consent of instructor.

456-3 Infant Development. Current theories and knowledge concerning growth and development of infants with related laboratory and field experiences. Prerequisite: 237 or Psychology 301 or equivalent.

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. 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.

Cinema and Photography

Graduate work in the Department of Cinema and Photography 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.

Students who take courses in the Department of Cinema and Photography supply their own film, photographic paper and certain specialized chemicals for still photography production courses, and film, processing, recording materials and editing supplies for motion picture production courses. In courses which involve analysis and screening a number of films, a screening fee is assessed. For some courses supplementary textbooks are required.

403-3 Studio Portraiture. History, theory and practice of formal studio portrait photography. Students purchase texts and provide photographic materials and chemicals. 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. 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. Prerequisite: 322 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. 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. Prerequisite: 322 and/or consent of department. Elective Pass/Fail.

411-2 Photography and Society. Study of the various uses of photography as a social force. Students purchase texts. Prerequisite: 310, 311. 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. 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. 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. 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. 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. Students purchase texts and provide photographic materials and chemicals. Prerequisite: 322 and consent of department. 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. Prerequisite: 322 and consent of department. Elective Pass/Fail.

450-3 Social History of the Cinema. Study of major social issues associated with the cinema. Examination of attempts to regulate and control the medium. Screening fee. Students purchase texts. Prerequisite: 350, 351 and consent of department. Elective Pass/Fail.

451-3 Advanced Film Theory. Study of the film theories of Munsterberg, Eisenstein, Kuleshov, Pudovkin, Arnheim, Balaz, Bazin, Kracauer, Wollen, Perkins 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: 351, 360 or 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. Prerequisite: 355 and/or consent of department. Elective Pass/Fail.

453-3 The Animated Film. Study of the content, techniques, aesthetics and history of the animated film. Screening fee. Students purchase texts. 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. Prerequisite: 356 and/or 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. Prerequisite: 455 and consent of department. Elective Pass/Fail.

460-3 History of the Silent Narrative Film. Study of the theatrical film from its beginnings to 1930. Screening fee. Students purchase texts. Prerequisite: 351 for cinema and photography majors. Elective Pass/Fail.

461-3 History of the Sound Narrative Film: 1927-1945. Study of the theatrical sound film from its beginnings to 1945. Screening fee. Students purchase texts. Prerequisite: 351 for cinema and photography majors. 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. Prerequisite: 351 for cinema and photography majors. 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. Prerequisite: 351 for cinema and photography majors. Elective Pass/Fail.

464-3 History of the Sound Narrative Film: Contemporary. Study of the major movements in theatrical motion pictures from neo-realism to the present. Screening fee. Students purchase texts. Prerequisite: 351 for cinema and photography majors. Elective Pass/Fail.

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.

495-1 to 12 Internship in Cinema or Photography. Credit for internships 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. 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. Prerequisite: consent of department. Mandatory Pass/Fail.

Clothing and Textiles

Graduate work in the Department of Clothing and Textiles is offered toward a concentration for the Master of Science degree in home economics.

Students will be required to purchase additional supplies for some Clothing and Textiles courses.

410-3 Experimental Apparel Designing. Development of apparel to meet esthetic, structural, and functional needs; problem-solving for exceptional proportions, rehabilitation, activity, performing arts, new technology. Offered alternate years. Prerequisite: 227 or 320 or consent of chairman.

420-3 Custom Apparel Designing. Flat pattern and draping approaches to evolve patterns for various designs, figure types, and fabrics; fitting; custom finishes. Emphasis on custom business. Prerequisite: 320 or equivalent.

430-3 Mass-Market Apparel Designing. Design of a line to specifications; drafting; toiles; mass-production costs; work flow; use of industrial equipment. Field trips. Prerequisite: 320 or equivalent.

432-1 to 6 (1 to 3 per topic) Workshop. Discussion and analysis of current topics in clothing and textiles. Emphasis stated in announcement. Maximum of three hours per topic. Prerequisite: eight hours in clothing and textiles.

434-3 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: 329.

439-3 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.

454-3 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: GSB 202 or equivalent.

470-1 to 3 Seminar. Topics considered at level of design room, research laboratory, mill, store, and consumer. Offered alternate years. Prerequisite: consent of chairman.

473-3 Advanced Tailoring. Concepts developed during fitting and tailoring of male or female garment. Organization of work and time management. Prerequisite: 360 or proficiency.

474-3 Experimental Textiles. Physical and chemical analysis of textiles. Design of experiments, treatment of data, and interpretation of results. Prerequisite: 304 or equivalent.

490-1 to 3 Readings. Supervised study of clothing and textiles literature in area of special interest. Prerequisite: senior standing or consent of chairman.

500-3 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.

570-3 Seminar. Individual preparation and presentation of topics related to clothing or textiles. Offered alternate years. Prerequisite: consent of chairman.

574-3 Textile Equipment and Testing Method. Standard procedures and research equipment for testing textiles. Current literature and developments in the field. Prerequisite: 474 or equivalent.

582-3 Foundations of Fashion. Anthropological approaches to fashion and socio-economic and psychological forces as determinants of fashion in modern times. Usually offered summers. Prerequisite: 329 or consent of chairman.

583-2 College Teaching of Clothing and Textiles. Central ideas, objectives, and current practices. For preparation of college teachers.

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.

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 Consumer Participation in Human Services Delivery Programs. Examines 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 consumer participation, history and dynamics of consumer movements, case studies. Elective Pass/Fail.

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 CD. (a) Planning in CD; (b) Preparing project proposals; (c) Center-periphery relations and CD; (d) Consumer cooperatives and CD; (e) Research problems in CD; (f) CD methods—research design and inference; (g) 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. Flexibly 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 problem-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.

593-1 to 5 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 9 Internship. The field internship is a requirement for the M.S. degree in community development. It consists of up to one year of supervised part-time field work in community development projects (approximately 400 clock hours). The course provides a field experience in which the intern can test and develop his skills; can demonstrate personal and professional growth; and can increase his ability to reflect on and conceptualize his field experience. Graded S/U only. Prerequisite: approval of field adviser.

599-1 to 5 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.

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 system configurations design and comparison. Prerequisite: 302.

403-3 Information Structures. Lists, trees, garbage collection, dynamic storage allocation, storage systems and structures, symbol tables and searching, sorting. Prerequisite: 302.

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, subroutines. Covers algebraic, list processing, and string manipulation languages. Prerequisite: 302.

414-3 Introduction to Systems Programming. 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. Structure of a two-pass assembler and a relocating program loader. Interpretive systems and the structure of compilers. Description of system support utility programs. Prerequisite: 403.

430-3 File Organization. Organization of records and blocks. Design of files, file systems, and access methods. File maintenance, sorting and searching. Techniques for creating and using hashed files. Applications of file searching and data management systems. Prerequisite: 403.

445-3 Applied Boolean Algebra. (Same as Mathematics 445.) Boolean algebras with applications to logic and circuit theory. Simplification algorithms. Sequential circuits and sequential machines. Prerequisite: 342.

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: 202 and 342.

451-3 Introduction to the Theory of Computation. (Same as Mathematics 451.) Sequential machines and automata. Regular expressions and characterization of the behavior of automata. Turing machines and recursive functions. The concept of an algorithm. Introduction to formal

grammars and formal languages. Relationship of formal grammars and machines. 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. Methodology, including generation and testing of sequences of random numbers. Design and analysis of computer simulation models. Simulation languages. Prerequisite: 202 and Mathematics 150.

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.) Development of the simplex method. Design of models. Introduction to duality theory. Transportation problems. Network flow problems. Postoptimality problems. Applications. Prerequisite: 202 and either Mathematics 221 or Mathematics 141.

490-1 to 9 Readings. Supervised readings in selected subjects. Prerequisite: consent of instructor and department.

491-1 to 6 Special Topics. Selected advanced topics from the various fields of computer science. Prerequisite: consent of instructor.

492-1 to 9 Special Problems. Individual projects involving independent work. Prerequisite: consent of department.

493-1 to 6 Seminar. Supervised study. Preparation and presentation of reports. Prerequisite: consent of instructor.

501-3 Advanced Computer Organization. Microprogrammable computer systems. Other current topics in computer organization. Prerequisite: 401.

514-3 Advanced Systems Programming. Operating systems for multiprogramming, multiprocessing, and time-sharing systems. General functions and special design problems. Virtual storage systems and virtual machines. Prerequisite: 414.

516-3 Compiler Construction. Source and translator languages. Design of a simple, complete compiler, including lexical analysis, syntactical analysis, and code generation. Advanced topics selected from mixed arithmetic, procedure parameters, optimization, compiler writing systems. Prerequisite: 403 and 411.

531-3 Text Processing and Retrieval Systems. Text processing for information retrieval. Indexing, classification and abstracting techniques. Information organization and data structures for information retrieval. Evaluation of retrieval system performance. 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: 403 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. Formal languages and their decision problems. Computational complexity classifications. Prerequisite: 451.

564-1 to 9 Advanced Numerical Analysis. (Same as Mathematics 572.) Selected topics chosen from such areas of numerical analysis as approximation theory, numerical solution of initial value problems, numerical solution of boundary value problems, numerical linear algebra, numerical methods of optimization, functional analytic methods. Prerequisite: consent of instructor.

590-1 to 9 Readings. Supervised readings in selected subjects. Prerequisite: consent of instructor and department.

591-1 to 12 (1 to 3 per semester) Special Topics. Selected advanced topics from the various fields of computer science. Prerequisite: consent of instructor.

592-1 to 9 Special Problems. Individual projects involving independent work. Prerequisite: consent of department.

593-1 to 6 (1 to 3 per semester) Seminar. Preparation and presentation of reports. 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.

Design

There is no graduate program in design. Four-hundred-level courses may be taken for graduate credit unless otherwise indicated in the course description.

405-6 Workshop in Group Design Problem Solving. Integration of workshops in innovation strategies, conflict management and team building, sensorial perception enhancement with real time socially relevant problem solving. Not for graduate credit.

410-3 Advanced Materials and Techniques. Analysis of materials used in shelter design—steel, concrete, wood, and plastics. Selection and use of these materials for maximum efficiency and economy. Not for graduate credit. Prerequisite: 310.

420-3 Portfolio and Display Techniques. Professional opportunities for the designer related to each student's background, educational and occupational skills will be explored. Students will be assisted in preparing: a resume, portfolio, letter of introduction, and a list of potential employers. Not for graduate credit.

430-6 (3, 3) Advanced Visual Design. Advanced work in visual design, with emphasis on creative research, and experimental design solutions to two- and three-dimensional communication problems. Not for graduate credit. Prerequisite: 335 or consent of instructor.

435-12 (6, 6) Human Communications Design Laboratory. Exploration and visual design as applied to various media of communication. Comprehensive projects dealing with the utilization of various communication media. Special emphasis on video tape recording production. Not for graduate credit.

445-12 (6, 6) Computer Graphics Laboratory. Creative utilization of existing computer programs; designing graphic qualities in the final output and learning to direct resources economically toward a successful end product; i.e., plots, documents, slides, film, etc. Not for graduate credit. Prerequisite: 335 and 340 or consent of instructor.

462-12 (6, 6) Environmental Design. Practical experience on both interior and exterior environments. Emphasis on expansion of conceptual ability, designer-client relationships, team projects, and professional standards. Not for graduate credit. Prerequisite: 362 or consent of instructor.

464-12 (6, 6) Human Settlement—Practice of Design. Using the theoretical criteria already developed, to study and propose design outlines to future patterns of human settlement. Not for graduate credit.

485-12 (6, 6) Design Science Laboratory. Application of the philosophy, theory, and methods of comprehensive anticipatory design science with selected problems related to the World Game Concept of R. Buckminster Fuller. Not for graduate credit. Prerequisite: 385 or concurrent enrollment.

490-1 to 6 Integrative Readings. Assigned readings in books and periodicals surveying the theory and practice of contemporary design. Not for graduate credit. Prerequisite: design major or consent of department.

491-3 to 18 Senior Seminar in Design. Special projects in design developed with adjunct and visiting professors. Not for graduate credit. Prerequisite: consent of department.

496-3 to 9 Special Problems in Design. Independent design project developed by student in conjunction with faculty sponsor and approved by department chairman. Not for graduate credit. Prerequisite: consent of department.

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.

Economics

411-3 Collective Bargaining and Dispute Settlement. Nature, issues, procedures, economic effects. Prerequisite: 310 or consent of instructor. Elective Pass/Fail.

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 consent of instructor. Elective Pass/Fail.

- 419-3 Latin American Economic Development.** A survey of the resource base of Latin American economic development with special reference to the problems of transition from an export-import to an integrated industrial economy; monetary policies; problems of economic planning. Prerequisite: 214 or consent of instructor. Elective Pass/Fail.
- 420-3 Recent Economic History of the United States.** Review and analysis of the chief characteristics, trends, and continuing problems of the economy of the United States in the 20th Century. Prerequisite: 214 or consent of instructor. Elective Pass/Fail.
- 422-3 Introduction to Economic Development.** An analysis of the preconditions, processes, and problems involved in economic development. Both the theory and policy relevant to development, with special emphasis upon the "developing" or "emerging" economies, are stressed. Prerequisite: 214 and 215 or consent of instructor. Elective Pass/Fail.
- 425-4 Economics in Geography.** (See Geography 422.) Elective Pass/Fail.
- 430-3 Regional Economy.** Natural economic regions, governmental action (as in the T.V.A.), local applications. Prerequisite: 215. 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.) A study of labor relations and legislation considering both constitutional and economic aspects. Prerequisite: GSB 211 and 212, 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.** A systematic examination of theories of inflation, unemployment, aggregate production, and income distribution in modern capitalistic and quasi-capitalistic economies. Emphasis is on understanding the causes of these crucial and recurring sources of conflict in Western economics. Not open to students who have had Economics 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.
- 460-3 Russian Economy.** Development of Russian trade, agriculture, industry, government, finance, and standards of living in successive periods in relation to the historical, geographic, economic, and ideological background. Prerequisite: 214 and 215, or GSB 211, or consent of instructor. Elective Pass/Fail.
- 465-3 Mathematical Economics I.** A systematic survey of mathematical economic theory. Conditions of static equilibrium (including stability conditions), optimizing behavior under constraints, and dynamic economic models. Prerequisite: 340 or 440 and Mathematics 140A and B or their equivalents, or consent of instructor. Elective Pass/Fail.
- 467-3 Introduction to Econometrics.** Problems in the quantification and testing of economic theories. Introduction to regression analysis. 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, fascism, and other forms of the economy. Prerequisite: 214 and 215, 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. Evaluation of theoretical, multi-disciplinary approaches to the employment relationship. Wage theory, the labor market, and collective bargaining are placed in the context of industrial relations as a separate discipline and this approach critically examined. Prerequisite: 411.

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.

525-2 to 4 Economics in Geography and Planning II. (See Geography 522.)

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. Emphasizes such topical areas as unemployment, underemployment, manpower training and development, labor market behavior, vocational education, labor problems of the handicapped, the aged, women, and minority groups, health economics, economics of education and poverty. Prerequisite: consent of instructor.

533-3 Public Finance Theory and Practice. Historical development of public finance theories with analysis of their policy implications. Prerequisite: 330 or consent of instructor.

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. Take 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. Take 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 emergency of mixed systems. Relates economic, social, and political systems and evaluates attempts to place economic systems within the context of general systems theory. Prerequisite: 481 or consent of instructor.

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 Regulation. An analysis of the economic causes and effects of the regulation of agriculture, business, and labor. Prerequisite: 440 or 340 or consent of instructor.

581-3 Economics of Welfare. The application of economic theory to the quest for economic welfare. Includes consideration of income distribution, rates of growth, the pricing system, and the role of government. Prerequisite: 440 or equivalent.

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. 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, assumptions and

practices which underlie empirical inquiry; to help the student to recognize the strengths and weaknesses of the various types of research in terms of methodology employed; and to aid the student in identifying and refining a research question and constructing a research design appropriate to answer the research question. Prerequisite: admission to the Ph.D. program in Education.

Educational Administration and Foundations

421-2 to 3 Law and the Teacher. Legislative and case law as it applies to the role of the teacher.

430-3 History of Education in the United States. An historical study of the problems of American education.

432-3 Education and Social Forces. A study of the social forces that shape educational policies in the United States.

454-3 Contrasting Philosophies of Education. An examination of current educational problems and trends in the light of contrasting philosophies of education.

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.

501-4 Educational Administration: Processes. An examination of the administrative 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.

503-4 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.

507-3 Secondary School Principalship. (Same as Secondary Education 564.) 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. Prerequisite: consent of instructor.

509-4 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 Curriculum Organization. (Same as Secondary Education 511.) The nature and organization 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. A field laboratory course for principals and superintendents.

517-3 Legal Basis of American 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.

525-4 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.

527-4 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.

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. (See Elementary Education 533.)

551-4 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. Special attention is given to the role of the superintendent as the educational leader in the community.

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.

553-4 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 6 (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, (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.

560-9 (3, 3, 3) The Twentieth Century and Education. A study of major movements in the contemporary world in terms of their importance for American education. (a) Education and culture, (b) The American way of life, (c) Challenges of the twentieth century.

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.

575-1 to 3 per topic. Individual Research. 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) Curriculum, (d) Finance, (e) School Law, (f) Supervision, (g) Comparative Education, (h) History of Education, (i) Philosophy of Education, (j) Sociology of Education. Maximum of six hours toward master's degree. Prerequisite: consent of chairman.

576-1 to 6 Readings in Administration and Foundations. Advanced reading in a previously identified area of interest. Prerequisite: consent of chairman.

588-3 to 9 General Graduate Seminar. Selected topics or problems in cultural foundations of education. Prerequisite: advanced standing and consent of instructor.

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 of 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.

Elementary Education

The Department of Elementary Education offers courses toward the Master of Science in Education degree in elementary education and the Master of Science in Education degree in early childhood education. Courses in this department may require the purchase of additional materials or supplies. Field trips are required for certain courses.

401-2 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.

409-3 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 (f) Reading, (c) Language Arts, (e) Mathematics, (g) Social Studies, and (d) Science. Prerequisite: specialized methods course for the field of study selected by the student.

410-3 Improvement of Instruction in Middle Grades (Grades 4—8). Examines recent findings, current practices, and materials in middle education settings in the field of mathematics. Prerequisite: specialized methods course for the field of study.

411-3 Seminar in Instruction. To assist pre- and in-service teachers in acquiring methods and materials that will improve instruction in the elementary school classroom, with special attention to the characteristics and needs of students. Prerequisite: Education 302.

413-3 Children's Literature in Early Childhood and Elementary Education. Emphasizes types of literature, analysis of literary qualities, selection and presentation of literature for children, and integration of literature in the pre-school and elementary education.

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 analysis of personal philosophy of early childhood education. Prerequisite: 316, 318, senior or graduate standing.

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.

430-2 Creative Writing in the Elementary School. Techniques of encouraging creative writing in the elementary school. Prerequisite: consent of instructor.

431-3 Education for Disadvantaged and Culturally Different Children in Early Childhood and Elementary School Settings. Examines the characteristics of behavior and learning patterns of culturally different and socio-economically disadvantaged children. Also discusses necessary school adjustment experiential background, self concept, language development, learning style, and appropriate teacher behaviors for relating to disadvantaged and culturally different children.

437-3 to 9 (3 per topic) Corrective Techniques for the Classroom Teacher. Discussion of diagnostic and remediation techniques for use in classroom in the areas of (f) Reading, (e) Mathematics, (c) Language Arts. Prerequisite: specialized methods course in field selected by student and/or consent of instructor.

441-3 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.

442-4 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; e.g., SAPA, ESS, SCIS. Lecture three hours per week, laboratory two hours per week. One or two additional field trips required. Prerequisite: teacher education or consent of instructor.

445-3 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: student teaching or consent of instructor.

475-2 to 33 (2 to 3 per topic) Workshop in Elementary Education. Critical evaluation of innovative programs and practices. Acquaints teaching within a single school system, or a closely associated cluster of school systems, with the philosophical and psychological considerations and methods of implementation of new programs and practices in one of the following areas: (a) Curriculum, (b) Supervision, (c) Language Arts, (d) Science, (e) Mathematics, (f) Reading, (g) Social Studies, (h) Problems in Elementary Education, (i) Early Childhood Education, (k) Administration and Supervision, (l) Disadvantaged Child. Maximum of six hours counted toward a master's degree. Prerequisite: 314.

503-3 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.

505-3 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.

507-1 to 28 (1 to 2 per topic) Independent Readings. Acquaintanceship with the literature and research, under the direction of a member of the departmental graduate staff, in one of the following areas: (a) Curriculum, (b) Supervision, (c) Language Arts, (d) Science, (e) Mathematics, (f) Reading, (g) Social Studies, (h) Problems in Elementary Education, (i) Early Childhood Education, (j) Elementary Education, (k) Administration and Supervision, (l) Disadvantaged Child, (m) Economics Education, (n) Organization. Maximum of four hours toward master's degree. Prerequisite: consent of instructor.

509-(3 to 9 per topic) Practicum. For master's students: professional consultation, teaching demonstration, practical application of advanced theory-work with clinical cases, or program development, implementation and evaluation in school systems or university. Readings and research directed to special problems involved in on-site situations in the following areas: (a) Curriculum, (b) Supervision, (c) Language Arts, (d) Science, (e) Mathematics, (f) Reading, (g) Social Studies, (i) Early Childhood Education, (j) Elementary Education. A maximum of nine hours credit may be applied toward a master's degree. Prerequisite: consent of instructor.

514-3 Organization and Administration of Reading Programs. (Same as Secondary Education 514.) For reading specialists, consultants, supervisors; for principals, administrators. Recent trends, research in organization and administration of reading programs. Kindergarten through junior college; materials, equipment, budget for special programs; study of roles of various personnel; in-service training. Specific problems of class members are studied. Prerequisite: 505 or Secondary Education 506.

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, 475j, 560, or consent of instructor.

518-3 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. A course for present and prospective teachers who wish to effectively deal with students in the various professional education experiences.

520-3 Diagnosis and Correction of Elementary Mathematics Disabilities. Causes of mathematical difficulties, observation and instrument procedures, experience in preparing materials for diagnosis and for corrective purposes. Prerequisite: 437e.

521-8 (4, 4) Diagnosis and Correction of Reading Disabilities. (Same as Secondary Education 521.) 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: 505 or Secondary Education 506 and instructor consent.

525-3 to 33 (3 per topic) Specialty Area Seminar. Exploration of research literature in one of the specialty areas listed. One of the following areas: **(a)** Curriculum, **(b)** Supervision, **(c)** Language Arts, **(d)** Science, **(e)** Mathematics, **(f)** Reading, **(g)** Social Studies, **(h)** Problems in Elementary Education, **(i)** Early Childhood Education, **(j)** Elementary Education, **(k)** Administration and Supervision. Maximum of six hours toward a master's degree. Prerequisite: consent of instructor.

531-3 Disadvantaged Schools: Research and Teaching. The focus of this doctoral level course would be on research in the various areas within the total context of urban and rural disadvantaged schools. Within a seminar context such issues as problems of administration, research on teaching and curriculum problems, research from the social sciences as it bears on the disadvantaged school-community and research on the various subject matter areas as related to the disadvantaged school-community. Prerequisite: advanced studies.

533-3 The Elementary Principalship. (Same as Educational Administration and Foundations 533.) A critical study of research and writings with implications for the elementary principals. Designed to meet many of the particular needs of persons interested in becoming elementary principals. Other persons such as teachers, superintendents, and staff personnel will gain insight into problems and responsibilities of the elementary principal's role.

537-3 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.

541-3 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: 441 or consent of instructor.

542-3 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 or 475c or consent of instructor.

543-3 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.

558-3 Leadership in Elementary Education. A study of research and writings concerning various leadership styles and behaviors. A major emphasis will be placed on studying leadership as it applies most appropriately to an elementary setting.

560-3 Early Childhood Education. A survey of current problems and practices in early childhood education for children from four to eight years of age, with emphasis on wide reading in current research literature. Prerequisite: consent of instructor.

561-3 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.

563-3 Organization of the Elementary School. An analysis of types of elementary school organization 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 student's professional problems.

564-(2 to 8 per topic) Internship. Culminating experience for Ph.D. or specialist students. Each student engages in specialized service areas either in his own or 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, **(c)** Language Arts, **(d)** Science, **(e)** Mathematics, **(f)** Reading, **(g)** Social Studies, **(i)** Early Childhood Education, **(j)** Elementary Education, **(k)** Administration and Supervision. A maximum of eight hours credit may be applied toward a Ph.D. or specialist degree. Prerequisite: consent of instructor.

570-3 Seminar, 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.

575-1 to 30 (1 to 3 per topic) Individual Research. 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, (c) Language Arts, (d) Science, (e) Mathematics, (f) Reading, (g) Social Studies, (h) Problems in Elementary Education, (i) Early Childhood Education, (j) Elementary Education. Maximum of three hours counted toward a master's degree program.

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 of the problem, survey of pertinent literature, recording of results, and appropriate interpretations and summarizations.

599-2 to 6 Thesis. Minimum of five 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.

Engineering

Safety glasses are required for some courses in this area.

443-4 (2, 2) 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. Must be taken in a,b sequence. 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: 455 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: 485.

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.

402-6 (3, 3) Crystal Structure Analysis. (Same as Chemistry 472.) **(a)** Introductory Crystallography. Lattice theory of the crystal. Miller indices. Crystal zones. The Bravais lattices. Symmetry elements. Proper and improper rotations. Point groups: crystal classes. Operators involving translation. Space groups. Elements of crystal structure. Coordination. Structure types. X-ray diffraction techniques. X-ray diffraction by single crystals: fundamental equations. Reciprocal lattice and Ewald sphere. Optical analog: the optical diffractometer. Single crystal photographic methods: the Laue method: rotating and oscillation. Weissenberg, Buerger-precession and Jong-Bounan, divergent and convergent-beam techniques. Interpretation of the x-ray diagrams. Diffractometric methods; fundamentals. Identification of polycrystalline materials with x-ray diffractometer (power method). Single crystal diffractometry. Absolute intensity measurements. **(b)** Crystal Structure Analysis. Fundamental diffraction relations. Determination of the cell size, chemical formula, symmetry and space group. Measurement of intensities: geometrical and physical factors affecting intensities. The structure factor: phase of the structure factor. The anisotropic temperature factor. Fourier synthesis. Electron-density projections. The phase problem. Utilization of anomalous dispersion. Direct determination. The Patterson method. Refinement of the structure with high-speed computers. Prerequisite: consent of instructor.

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. Prerequisite: 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. Prerequisite: 448 or consent of instructor.

462-3 Matrix Methods of Structural Analysis. Displacement and force methods of analyzing trusses, continuous beams and rigid frames. Composite structures. Plane grids. Direct element method. Computer library programs will be used. Prerequisite: 440, Engineering 222 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 and/or problems. 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 of 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-phonon 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. Langrangian 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. 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 liquifying systems. Prerequisite: Engineering 300, 302.

415-4 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 the bacteria and their metabolism processes in the degradation of organic wastes. Treatment and disposal of sludges produced in wastewater treatment. Advanced waste treatment processes; reuse of wastewater. Prerequisite: 314.

416-4 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. 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. Recommend concurrent enrollment in 314.

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 systems. 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: Engineering 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.

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 for multiple reactions; temperature and pressure effects. Nonisothermal and nonadiabatic processes. Non-ideal reactors. Prerequisite: 435.

532-3 Separation Processes and Equilibrium Operations. Phase equilibrium, multistage calculations, graphical methods, unsteady-state stagewise operations. Multicomponent systems. Rate separation processes. Applications in processing industry. Prerequisite: 435.

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 Colloquy in Engineering Biophysics. Discussion of topics related to engineering biophysics; guest lecturers; field trips. Offered in spring semesters only. Each student in engineering biophysics should register for the colloquy each academic year in residence.

598-1 to 6 Internship in Engineering Biophysics. The fifth year in the engineering biophysics program emphasizes courses 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 semi-conductors. Laboratory. **(b)** Parameters and applications of operational amplifiers, linear integrated circuits, monolithic voltage regulators, and digital integrated circuits. Laboratory. Must be taken in a,b sequence. Prerequisite: 304b.

415-3 Elementary Concrete Design. Properties of concrete materials; design of concrete mixes; analysis and design of basic concrete structural elements using ACI design handbooks. Laboratory. Prerequisite: 315.

416-3 Elementary Structural Steel Design. Properties of structural steel shapes; types of structural steel material; analysis and design of simple structural elements and connections for steel buildings and bridges. Laboratory. Prerequisite: 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 a power plant. Prerequisite: 313b, 318b, 424a.

426-6 (2, 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 developments. Laboratory. Prerequisite: 363a or consent of instructor. **(b)** Rectification of tilted photographs; stereoscopic plotting instruments; principles and use of oblique photography; analytic photogrammetry and new concepts. Laboratory. Prerequisite: 426a or consent of instructor. **(c)** Analysis of aerial photographs to determine soil and rock formations and their properties; interpretations for engineering and regional planning purposes. Laboratory. Photos and maps required for each course, costing approximately \$3.00. Prerequisite: 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.

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 America 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 Greene, 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 non-print media to the study and teaching of English. Especially emphasized is the relationship between print and non-print communications systems and verbal and non-verbal systems. Prerequisite: consent of instructor.

485-2 Problems in Teaching Composition and Language in High School.

486-2 Problems in Teaching Literature and Reading in High School. Prerequisite: 485.

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. Elective Pass/Fail.

492-3 to 9 (3 per topic) 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 to the Senior Project 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.

499-2 to 6 (2 to 3, 2 to 3) Readings in Literature and Language. For English majors only. 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.**
- 596-3 Stylistics.** (Same as Linguistics 596.)
- 600-1 to 36 (1 to 16 per semester) Dissertation.**

Family Economics and Management

Graduate work in the Department of Family Economics and Management is offered toward a concentration for the Master of Science degree in home economics.

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. Prerequisite: consent of instructor.

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.

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: Guidance and Educational Psychology 505.

530-3 Societal Factors in Housing. An analysis of housing as it related 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. Spring 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 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

Graduate work in the Department of Food and Nutrition is offered toward a concentration for the Master of Science degree in home economics.

420-2 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 Readings. Supervised readings for qualified students. Prerequisite: 320 or equivalent, consent of instructor and department chairman. Elective Pass/Fail.

490-2 Nutrition and Growth. Lectures, readings, and discussion on nutrition in relation to human growth. 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.

Foreign Languages and Literatures

436-3 Methods in Teaching Modern Foreign Languages. Survey of general principles of second-language teaching, based upon insights of modern linguistics and learning-psychology. Followed by intensive practical work in classroom and language laboratory with teachers experienced in the student's specific language field. Required of prospective teachers of modern foreign languages in secondary schools. Prerequisite: concurrent or prior enrollment in 300-level course in French, German, Russian, or Spanish. Elective Pass/Fail.

437-2 to 6 (2, 2, 2) 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.

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.

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: 332 or 405 or GSC 330, and GSC 217 or Religious Studies 310, 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, 228b satisfies the graduate school foreign language as a research tool requirement. Generally restricted to graduate students. Undergraduates must petition appropriate section head for admission.

410-2 Critical and Artistic Writing. Composition based on study of contemporary French for the purpose of polishing the individual student's written expression; free exercise, translation, imitation of various styles both formal and informal, opportunities for creative writing. 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.

475-2 to 4 Travel-Study in France. Comprises part of the formal travel-study program offered by the department. Elective Pass/Fail.

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 and 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 foreign language as a research tool requirement. Generally restricted to graduate students. Undergraduates must petition appropriate section head for admission.

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 German Stylistics. Basic principles of *Stilkunde*, with emphasis on exercises acquainting the student with the various levels of language usage and with the essentials of effective writing in 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 3 Independent Study in German. Project-study under supervision of German faculty. Amount of credit depending on scope of study. Not for graduate credit. Prerequisite: senior standing and approval of supervising instructor.

501-2 to 4 (2, 2) Seminar in Literature, Culture, or Folklore. Intensive study of a selected topic in German literature, culture, or folklore. Revolving subject matter; may be repeated once, for a total of four semester hours.

502-2 to 4 (2, 2) Seminar in Germanic Linguistics. Intensive study of a selected topic in historical or descriptive Germanic linguistics. Revolving subject matter; may be 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.

599-1 to 6 Thesis.

Greek

No graduate program is offered through the Greek 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.

Latin

No graduate program is offered through the Latin 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 foreign language as a research tool requirement. Open to graduates and undergraduates. Need not be taken in sequence.

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.

Romance Philology

No graduate program is offered through the romance philology section. Four-hundred-level courses in this section may be taken for graduate credit unless otherwise indicated in the course description.

410-3 Romance Philology. Survey of phonology, morphology, and syntax changes in Romance languages in general; special attention to the developments in French and Spanish for students with majors in these fields. 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, not 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 foreign language as a research tool requirement. Generally restricted to graduate students. Undergraduates must petition appropriate section head for admission.

411-3 Russian Stylistics. Writing style in Russian and its application to the development of skill in written expression. Prerequisite: 310 or 326 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. Reading and translation from contemporary news media. Prerequisite: 201 or equivalent. 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 Socialistic Republics. Prerequisite: 201 or equivalent. Elective Pass/Fail.

480-3 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.

515-3 Russian Linguistic Structure. Structural analysis of present-day Russian with special attention to morphology and syntax.

519-3 Comparative Slavic Phonology and Morphology. Contemporary comparative Slavic languages. Emphasizes phonology, morphology, and syntax.

540-2 Russian Literature of the 18th Century. The Baroque period, classicism and sentimentalism. Emphasis on the classical period of the 18th Century. Analysis of texts and reports.

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 foreign language as a research tool requirement. Generally restricted to graduate students. Undergraduates must petition appropriate section head for admission.

415-3 The Linguistic Structure of Spanish. Phonology and grammatical structure of Spanish. Examination of the features of the principal dialects. Required of all undergraduate majors. Elective Pass/Fail.

417-3 History of the Spanish Language. Survey of development from the Middle Ages to the present day. 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 Quijote. 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.

460-5 (3, 2) Spanish Literature of the 20th Century. (a) The novel in Spain from the Generation of 1898 to the present. (b) Poetry and drama since 1900. Elective Pass/Fail.

475-2 Travel-Study in Spain or Latin America. Course taught as part of the travel-study tour in Spain or Latin America. Usually given in the summer. Concurrent participation in travel-study tour in Spain or Latin America required. Elective Pass/Fail.

480-2 Spanish Poetry. Representative selections from medieval, Golden Age, and 19th century Spanish poetry.

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 2 Readings in Spanish.** Directed independent readings in a selected area. Prerequisite: consent of department. Elective Pass/Fail.
- 502-2 to 8 (2, 2, 2, 2) Seminar in Hispanic Linguistics.** Intensive study of a selected topic to be announced each semester. Suggested topics: semantics, meta linguistics, problems in translation, Hispanic dialectology, phonology, etc.
- 503-2 to 6 (2, 2, 2) Seminar on a Selected Topic in Spanish or Spanish American Literature.** Intensive study of a topic to be announced for each semester.
- 510-2 Seminar in Syntax.** Stylistics and grammatical analysis.
- 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 and extensive study of a 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 and extensive study of a literary movement, trend, genre, or author of the period, as specified by the topic to be announced for each semester.
- 536-1 Teaching Spanish at the College Level.** Prepares graduate students in Spanish for teaching at the college level. Required of all teaching assistants in Spanish. Does not satisfy secondary certification requirements.
- 540-2 to 4 (2, 2) Spanish Literature of the 18th and 19th Centuries.** Intensive and extensive 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 and extensive study of a literary movement, trend, genre, or author of the period, as specified by the topic to be announced for each semester.
- 565-2 to 6 (2, 2, 2) Spanish American Literature of the 20th Century.** Intensive and extensive 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.

- 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: six hours of micro- and macro-economic principles.
- 412-2 Forest Genetics I.** Basic theories and techniques of obtaining genetically superior trees for forest regeneration. Prerequisite: senior standing.
- 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; deter-

mination of forest land values; institutional factors influencing forest land-use; forest taxation; special taxes, and capital gains. Taught in alternate years. Prerequisite: 411 or consent of instructor.

418-2 Marketing of Forest Products. The role of marketing in the forest industries; review of economic principles; product policy, planning the product line, pricing, marketing channels, marketing programs, marketing organization, and marketing research as influences on the marketing of lumber, wood products, pulp, and paper. Taught in alternate years. Prerequisite: 411 or consent of instructor.

420-3 Park and Wildlands Management. The management of state and federal parks and recreation areas. A systems approach toward management and decision-making will be emphasized. Requires supplemental purchases of approximately \$5.00 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.

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 silvicultural practices as they are commonly employed in various regions of the United States. Offered alternate years. Prerequisite: 310C.

440-3 Urban Forestry Management. Urban forestry research programs, shade tree commissions and ordinances, community forestry planning; state, federal, and international programs case history studies and preparation of a model municipal forestry plan. Required field trip additional costs, \$20.00. Prerequisite: 340.

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. Prerequisite: 311C.

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 of assessing the impact of forest management systems of environmental quality are presented. Case studies culminating in the preparation of environmental impact statements are emphasized. Prerequisite: 300, 312, 313, 310, 430, Botany 320 or equivalent.

460-2 Forest Industries. Analysis of raw material requirements, the processes and the products of forest industries. The environmental impact of each forest industry will also be discussed.

492-1 to 4 Special Problems in Forestry. Research and individual problems in forestry. Prerequisite: consent of chairman.

494-1 to 6 Practicum. Supervised practicum experience in a 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 Forest Genetics II. Advanced theories in population genetics and ecological genetics among forest trees. Offered alternate years. Prerequisite: 412.

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 the 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 graphical 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 for 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

406-2 Advanced Cultural 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 Cartography and Computer Mapping. Introduction and practice in the techniques of mapmaking and problems in map reproduction. Laboratory. Prerequisite: 310 or consent. 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.) Prerequisite: 300 or consent. 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 multi-disciplinary 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 175,000 population. This plan is "played" against a

50-year trace of hydrologic parameters in a computer simulation. Prerequisite: 424 or consent. Elective Pass/Fail.

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 diseases 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.

432A-4 Urban Climatology of the Environment. 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. 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. 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. (Same as Geology 438.) 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. 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. 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. Prerequisite: 300. Elective Pass/Fail.

470-9 (3, 2, 2 to 4) Urban Planning. (Same as Political Science 447.) (a) Planning concepts and methods. (b) Field problems. (c) Planning and public administration internship. Prerequisite: consent of department. Elective Pass/Fail.

471-2 Regional Planning. Examination of the viewpoint, methods, and techniques of regional 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.

500-3 Principles of Research. Meaning, philosophy, science, reasoning, creative endeavour, 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.** Prerequisite: 422.
- 524-2 to 4 Seminar in Cultural Geography.** Prerequisite: graduate standing.
- 527-2 to 4 Seminar in Urban and Regional Planning.** Prerequisite: graduate standing.
- 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.

412-2 Advanced Mineralogy. A continuation of 310 with emphasis on crystallography, crystal chemistry, crystal structure, and stereographic projection. Prerequisite: 310.

414-1 to 2 Paleobotany. (See Botany 414.)

415-3 Optical Mineralogy. The optical properties of minerals and the use of the petrographic microscope for identification of crystals by the immersion method and by thin section. Lecture, laboratory. Prerequisite: 310, Physics 203b, 204b, or 205b.

416-3 X-ray Crystallography. (Same as Chemistry 416.) Introduction to the study, measurement, and identification of unknown crystalline materials by X-ray diffraction techniques (especially the Debye-Scherrer methods). Upon request, non-geology majors may work with unknowns from their own fields of study. Prerequisite: 310, Mathematics 150 or consent.

418-3 Low Temperature Geochemistry. The application of chemical principles to geologic processes that occur on and near the earth's surface. Lecture, laboratory. Prerequisite: 310, Chemistry 222 or equivalent.

419-4 Ore Deposits. The geological and other factors that govern the exploration for and occurrence of metalliferous mineral deposits. Study of the geological settings of the major types of ore deposits. Lecture, laboratories, and field trips. Prerequisite: 302, 315.

420-3 Petroleum Geology. The geological occurrence of petroleum including origin, migration, and accumulation; a survey of exploration methods, and production problems and techniques. Laboratory study applies geological knowledge to the search for and production of petroleum and natural gas. Prerequisite: 221, 302. 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, GSA 115. 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 paleoecological approaches. Recognition of ancient environments 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 American landforms and their origins. The approach designed to give interaction among students, stimulus in organization and presentation of material and library competence. Plan a trip for optimum view of North American physiography. Prerequisite: 220.

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 geophysi-

- cal instruments and interpretation of data. Field trips required. Prerequisite: 220, Mathematics 150.
- 438-3 Applied Meteorology.** (See Geography 438.) Elective Pass/Fail.
- 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.
- 449-1 to 2 Internship.** Credit for professional experience in the geological sciences. Arrangements made with chairman. Prerequisite: advanced standing.
- 450-2 Introduction to Field Geology.** Introduction to field techniques, principles of geologic mapping and map interpretation. Field trip fee \$5.00. Prerequisite: 302 and 315. 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 \$80.00, supplies \$6.00. Prerequisite: 302, 315; 450 recommended.
- 455-3 Engineering Geology.** (Same as Engineering 455.) An examination of problems posed by geology in the design, construction, and maintenance of engineering works. Topics studied include ground water, land subsidence, earthquakes, and rock and soil mechanics. Two term papers and a field trip required. Prerequisite: 220 or consent.
- 460-3 Geological Data Processing.** Computer applications to geological problems including the processing and programming of data and the interpretation and evaluation of results. Lecture, laboratory. Prerequisite: Engineering 222 or Computer Science 202.
- 465-2 Evolution of Orogenic Belts.** A combination of lectures and seminars in which the structural development of specific orogenic belts is investigated in detail. Prerequisite: 302 or equivalent, 466 or consent.
- 466-3 Global Tectonics.** An introduction to the concepts of plate tectonics, earthquake seismology, geomagnetism, terrestrial heat flow and their application to regional geological evolution. Lecture and assigned problems only. Prerequisite: 302 or equivalent.
- 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.
- 471-3 Earth Science for Teachers II.** 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.
- 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.
- 482-3 Coal Petrology.** Structural features and microscopy of coal seams. Origin and alteration of coal constituents. Includes field trips, study of coal specimens, and techniques. Prerequisite: 220 and 221 or consent of instructor.
- 484-3 Palynology.** (Same as Botany 484.) Taxonomy, morphology, stratigraphic distribution, and ecology of fossil pollen, spores, and associated microfossils. Prerequisite: 220, 221, or consent of instructor.
- 500-1 to 2 Teaching for Geology Graduate Students.** To help teaching assistants develop skills in conducting laboratory work and leading discussions. One hour required for all teaching assistants in geology. Graded *S/U* only.
- 510-3 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.
- 512-3 Sedimentary Petrology.** Petrographic classification, origin, and diagenesis of detrital and chemical sedimentary rocks. Petrographic identification of minerals, rock fragments, textural combinations, and diagenetic fabrics. Laboratory. 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.

526-3 Advanced Topics in Applied Paleoecology. Lectures, field, and laboratory studies, including techniques and quantitative methods. Preparation for research in paleoecology. Emphasis on using fossil marine invertebrates and trace fossils to interpret ancient sedimentary environments. Prerequisite: 428 or consent.

527-2 Micropaleontology I. Structure, classification, paleoecology, stratigraphic distribution, and evolution of conodonts and ostracodes. Field and 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.

528-2 Micropaleontology II. Structure, classification, paleoecology, stratigraphic distribution, and evolution of foraminifera. Laboratory work in techniques of collection, preparation, and study of foraminifera. Identification and use of foraminifera 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.

536-3 Advanced Studies in Geophysics. Requires study in depth of some aspect of geophysics. Taught either as independent laboratory or field work or as a seminar depending upon students and their interests. Prerequisite: 436.

542-2 (1, 1) Seminar in Geology. Seminars in advanced topics in geology. Prerequisite: graduate standing.

565-3 Fundamentals of Structural Geology II. 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: 302 or equivalent.

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 Glacial and Periglacial Geomorphology. Glacial mechanisms, characteristics, and origin of erosional features and deposits formed by glacial and periglacial processes. Prerequisite: 374.

582-3 Advanced Coal Petrology. Microscopy, source materials, coalification, constitution, and classification of peats, lignites, bituminous coal, anthracite; applications to industrial problems. Prerequisite: 482.

584-2 Advanced Palynology. (Same as Botany 584.) Paleoecological interpretations, morphology, and advanced techniques of analysis and preparation of fossil spores and pollen. Prerequisite: 484.

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.

422-2 to 3 Educational Measurement and Evaluation. For persons interested in methods of measuring and evaluating school-related cognitive and non-cognitive behavior. Those requiring experiences with teacher-made tests should register for two hours, while those seeking more comprehensive experiences, including standardized tests, should register for three hours. Elective Pass/Fail.

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.

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.

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.

494D-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 consultations, field observations, and psychometric applications. Prerequisite: consent of instructor.

502-4 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 505 and 502.

505-2 Introduction to Statistical Methods. Covers basic descriptive techniques such as central tendency, measures of variability, graphical presentation of data, designing experiments, and hypothesis testing.

506-4 Inferential Statistics. Open to doctoral students only, or consent of instructor. Hypothesis testing, including all analysis of variance designs; nonparametrics, simple linear prediction. Prerequisite: 502 or 505 or a proficiency test completion.

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.

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.

516-3 Concept and Principle Learning: Design, Delivery, and Evaluation of Instruction. Students in this course learn to: recognize and construct instructional tasks which demand concept and principle learning; describe the necessary conditions for learning concepts and principles; construct instructional programs which produce student learning of concepts and principles; and construct valid procedures for evaluating student learning of concepts and principles. Prerequisite: 515 or concurrent enrollment.

517-3 Intellectual Strategy Learning: Design, Delivery, and Evaluation of Instruction. In this course students will learn to: recognize and construct instructional tasks which demand intellectual strategy learning; describe the necessary conditions for learning various intellectual strategies; construct instructional programs which facilitate student learning of intellectual strategies; construct valid procedures for evaluating student possession of intellectual strategies. Prerequisite: 515 and 516.

518-3 Affective Outcomes: Design, Delivery, and Evaluation. Students in this course learn to: select, specify, and prioritize affective objectives for various types of affective learning; apply learning and instruction theory to design, implement, evaluate; and revise instruction to achieve affective goals. Prerequisite: 515.

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 stan-

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 of these theoretical principles.

532-2 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. 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 Issues and Trends in School Guidance and Counseling. Directed toward providing students an opportunity to determine current issues and trends, to read referred journals in the field, to examine current issues with an emphasis toward relating and placing the foundations in perspective, and encouraging students to raise issues of their own.

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 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. Prerequisite: 532b.

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.

595-8 Internship in Applied Instructional Psychology. Full-time practice in the design, delivery, and evaluation of instruction and/or the analysis and management of classroom behavior. Interns coordinate the efforts of a project staff and are supervised by university faculty. Prerequisite: 517, 518, 521, and 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.

405-3 Sex Education School Programs. Examines various programs of sex and family life education in schools, recognizing a range of community attitudes.

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 Red Cross authorization and 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. 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.

445S-2 Contemporary Specialized Laboratory Techniques. Provides teachers and other highway safety personnel with experience in specialized laboratory techniques, motorcycle rider, evasive and emergency maneuvers, multiple-car. Prerequisite: 443S or consent of instructor.

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.

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-2 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.

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 Ecological 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 of population projections; collection, organization, interpretation, summarization, and evaluation of data relative to biological happenings with emphasis on graphic presentation.

490-2 to 6 Field Experiences in School, Community Health or Safety Education. Field observation, participation, and evaluation of current school or community health education or safety programs in agencies relevant to student interests. Prerequisite: consent of instructor.

491-3 Health Teaching / Learning: School and Community. Teaching and learning strategies at secondary school levels and in other community group settings. Opportunities to examine and observe a variety of educational strategies applicable to health education.

495S-3 Driver Education for the Handicapped. Methods and techniques in the use of assistive equipment and program materials for teaching handicapped persons how to drive. Prerequisite: advanced standing or consent of instructor.

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.

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.

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. Prerequisite: advanced graduate standing and consent of instructor.

572-3 Coordination and Supervision of School Health and Safety Programs. For advanced students who will have leadership responsibilities in planning, implementing, and

coordinating comprehensive health and safety 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 (1.5, 1.5) Institute: Writing Research Proposals. (a) Focus is on delineating a research proposal outline based on needs assessment and recognized competencies of the investigators. Consideration is given to an overview of funding sources, proposal guidelines, procedures for support and involvement of various community groups, review of relevant literature, methodology, budgetary requirements, and evaluation procedures. **(b)** Students examine different types of funded projects, develop a research prospectus and analyze the art of grantsmanship and political action.

599-3 Thesis.

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

Higher Education

402-2 Principles of Student Personnel Group Work. Acquaints the student with group work possibilities and functions in higher education. Elective Pass/Fail.

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 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, 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)** 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 Administration, **(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 of all doctoral students. Prerequisite: consent of instructor.

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 from 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 Political History of 19th Century Europe. **(a)** 1815-1871; **(b)** 1871-1914. Changing social structure of Europe caused by industrialization. The consequence of this development in terms of the emergence of new social forces and political problems. 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.
- 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-economics, and political history from the Middle Ages to the present.
- 437-6 (3, 3) History of Russia. (a)** Imperial Russia from Peter the Great to the emancipation of the serfs; **(b)** Russia since emancipation; modernization and revolution. The study of Russian history from Peter the Great to the present. Elective Pass/Fail.
- 450-4 American Colonial History.** The discovery, settlement, and development of the colonies before the American Revolution.
- 451-3 American Party Politics: Federal Period Through the Age of Jackson.** Issues and conflicts which dominated the American scene from 1790 through the Jacksonian 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 nationalism: 1865-1896. The study of the background to the Civil War, the Civil War, Reconstruction, and the Gilded Age.
- 453-6 (3, 3) Twentieth Century American History. (a)** 1896-1921; **(b)** 1921-1945. The history of the United States since 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. 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 Precolumbian 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. 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.

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. Prerequisite: consent of instructor.

495-4 History Honors. Principles of historical method, research, and writing for senior honor students only. Not for graduate credit. Prerequisite: consent of department.

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.

554-4 New Viewpoints in American History. New interpretations and recent developments in American history.

555-4 to 8 (4, 4) Seminar in American History. A content and research course in American history. Topics will vary with the instructor.

561-4 Seminar in American Constitutional History. A content and research course concerning specific areas of American Constitutional history.

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.

570-8 (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.

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

Graduate work in the Department of Home Economics Education is offered toward a concentration for the Master of Science degree in home economics as well as toward the Master of Science in Education degree in home economics education.

407-2 to 4 Workshop. Designed to aid home economics teachers, supervisors, and leaders in the field with current problems. Resource people are used. Discussions, reports, lectures, and other methods of analyzing and working on solutions to problems. Emphasis for the workshop will be stated in the announcement of the course.

414-2 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.

416-3 Working with Special Needs Learners. 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.

417-3 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.

421-2 Demonstration and Laboratory Techniques in Home Economics Education. Practice in planning and carrying out instructional demonstrations in home economics for youth and adults. Use of audiovisual aids and hand-outs. Procedures for laboratory and guided practice to develop psychomotor skills. Attention given to TV presentations. Possible expense for materials to use in classroom demonstrations \$5 to \$8.

425-3 Introduction to Cooperative Vocational Education. Development of competencies required by teachers in the occupational program in home economics. Operational procedures and production of instructional materials for HERO programs in secondary and adult education. Supervised work experience. Work block required. Field trips. Transportation expense for work and field trips. Prerequisite: basic professional block in education, eight semester hours.

426-2 Individualizing Instruction in Home Economics. A study of rationale for individualizing instruction in an examination of components, characteristics, and appropriateness of individualized programs. Designing and developing individualized methods. Prerequisite: student teaching or consent of instructor.

485-3 Principles and Philosophies of Vocational and Technical Education. (See Occupational Education 485.)

486-2 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.

490-2 to 4 Readings. Supervised readings for qualified students. Prerequisite: consent of instructor and chairman of department.

500-3 Research Methods. Methods employed in research in home economics education with special study according to interest and needs of student. Development of prospectus. Prerequisite: Guidance 505 or consent of instructor.

501-3 Legislation, Organization, and Application of Occupational Education. Historical and contemporary thought and practice regarding federal and state legislation for occupational education in sundry institutions. Legislators are used as resource persons. Required for supervisors.

505-3 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.

506-3 Evaluative Procedures in Home Economics. Principles and procedures underlying appraisal and evaluation. Development and critical consideration of instruments for appraising pupil growth and the program of instruction. Emphases placed on values, attitudes and needs. Offered alternate years.

510-3 Supervision of Home Economics. Nature, function, and techniques of supervision at all levels. Emphasis given to supervision of student teachers. Offered alternate years.

515-3 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.

516-3 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.

517-3 Methods and Materials for Adult Programs in Home Economics. Philosophy of adult education; current organizational patterns of adult programs; unit planning, methods, techniques, and resources. Offered alternate years.

525-3 Cooperative Vocational-Technical Education. (See Occupational Education 525.)

571-2 Recent Research. Review of selected research in home economics education and governmental and industrial agencies. Emphasis on action research and use of research findings. Offered alternate years.

573-1 to 4 Seminar: Research in Home Economics. Presentation of prospectus outlines, research projects, problems for research, progress reports of research by graduate students and faculty. Prerequisite: consent of instructor.

592-1 to 4 Special Problems. For students whose particular needs are not met by existing classes. Prerequisite: consent of chairman.

594-1 to 3 Practicum in Supervision. Experience in using a variety of techniques at various levels and areas of supervision both on and off campus. Prerequisite: 510 or Educational Administration 556 or consent of instructor.

599-2 to 6 Thesis.

600-1 to 32 Dissertation. Minimum of 24 hours to be earned for the Doctor of Philosophy degree.

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.

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. Prerequisite: 309, 310.

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.

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.

465-7 (4, 3) Industrial Safety. (a) Principles of industrial accident prevention; accident statistics and costs; appraising safety performance; and industrial hazards and safeguards. Emphasis is placed on the Occupational Safety and Health Act of 1970. Prerequisite: senior standing. **(b)** Effective industrial safety organizations, management, and supervision; safety psychology, and training programs. Prerequisite: senior standing.

Instructional Materials

Courses in this department may require the purchase of supplemental materials.

400-2 Library Research Methods. Introduction to the use of library materials for graduate research. The use of bibliographies and reference works in various subjects. The student will consult sources in his own discipline. Not open to students in the department.

401-3 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.

405-3 Media for Children. Study of aids, methods, and criteria for the selection and use of books and other instructional materials for children in the elementary schools.

406-3 Media for Young People. A study of the aids, methods, and criteria for the selection and use of books and other instructional materials for students in the high schools.

407-3 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.

408-3 Selection of Media. Evaluation of print and non-print media; resources and services; competencies for efficient purchasing, selecting and utilizing media.

409-4 Administration of the School Media Program. Functions and management of elementary and secondary school media programs with emphasis on services, personnel, financial aspects, facilities, and evaluation. Current issues and trends as reflected in the literature.

440-3 Photography for Teachers. Photography as a tool of communication in the modern school. Techniques of camera handling, visually planning a story, macrophotography, and color slides. Prerequisite: education major.

445-3 Local Production of Educational Media. The study of the various processes and techniques used by classroom teachers in the production of locally-made non-photographic instructional materials. Prerequisite: Education 304a or consent of instructor.

447-3 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: 440 or consent of instructor.

450-3 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.

470-2 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.

480-2 Simulation and Gaming. (Same as Secondary Education 480) 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.

501-5 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.

507-3 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: 407.

510-2 Mass Communication in Education. The use of mass media in the classroom. Includes radio, TV, comic books, newspapers, magazines, and movies.

513-3 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: 401.

520-2 The Library of Congress Classification Scheme. The study of the Library of Congress classification scheme as it is utilized in junior college libraries. Prerequisite: 401.

522-3 Selection for the Junior College Media Program. The selection of written and recorded materials of all kinds for the junior college library. Deals also with the accessibility of materials, information retrieval, and the preparation of bibliographies. Prerequisite: 407.

523-3 Administration of the Junior 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 junior college media center. Field trips are planned.

530-3 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.

545-2 Instructional Design. The primary purpose of the course is to give 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: 440, 445, or consent of the instructor.

546-3 Integration of Educational Media. The utilization and integration of print and non-print materials in the teaching approach. The course is structured for media directors and administrators. The increasing role of technological advances in education is stressed.

549-2 Visual Learning. Learning from pictures in the classroom, the design of still and motion pictures, pictures used in testing perception, and the place of pictures in advertising and communication.

550-3 Seminar in Educational 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.

554-3 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. It is based on the concept of a single agency in the school system which encompasses all forms of educational media. Prerequisite: 409.

555-4 Survey of Research and Developments in Educational Media. Survey of research, research techniques, needed research and development of an awareness of new developments and programs in educational media. Investigation of new curriculum and organizational developments in the public school.

560-2 to 4 Seminar in Educational Media. Designed to give advanced graduate students an opportunity to investigate and discuss topics in educational media before the seminar group. Topics selected would depend on background and interest of students. Graded *S/U* only. Prerequisite: consent of instructor.

590-1 to 3 Readings in Educational Media. Directed reading in a previously identified area of interest, designed to cover special topics and to fill gaps in students' specialized background. Graded *S/U* only. Prerequisite: consent of instructor and department.

591-1 to 3 Individual Study in Educational Media. Guided study into selected topics under the supervision of a graduate faculty member. Graded *S/U* only. Prerequisite: consent of instructor and department.

592-1 to 3 Special Problems in Educational Media. Directed research by an individual in special problems. Graded *S/U* only. Prerequisite: consent of instructor and department.

594-6 to 12 (6, 6) Practicum. Supervised experience in a public school, junior college, or university. Practical experience in administration, supervision, and production in an educational media center. Graded *S/U* only.

599-4 to 6 Thesis. Minimum of four hours to be counted toward master's degree.

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

Interior Design

Graduate work in the Department of Interior Design is offered toward a concentration in family economics and management for the Master of Science degree in home economics.

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: eight 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: eight hours in interior design or consent of chairman.

491-3 Advanced Interior Design. Systematic analysis of human factors as determinants of design solutions for large-scale interiors. Lecture and laboratory. Prerequisite: 391c 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.

Journalism

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.

411-2 Public Affairs Reporting. Covering government and other public agencies, including the city hall, courts, county offices, business, finance, agriculture, labor, and other specialized beats. Prerequisite: 311.

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.

421-2 Teaching High School Journalism. Teaching methods of journalism in secondary schools, organization and course of study, bibliography, use of journalism courses for school publications production, exercises in creative classroom training, and developing examinations.

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.

479-2 Social Issues and Advertising. Analysis of social issues involving advertising; economic relationships, governmental 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.

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.

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.

559-1 to 6 Thesis.

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

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 Asian Studies 321 and Linguistics 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: 321 or Asian Studies 321 and Linguistics 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 Asian Studies 321 and Linguistics 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.
- 440-3 to 6 (3, 3) 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.
- 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.
- 453-3 Methods in Teaching English as a Second Language.** Survey of general principles of second-language teaching as applied to English. Individual observation and practice in EFL classwork. 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 pre-history 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.
- 540-3 to 6 (3, 3) Studies 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.
- 550-8 (4, 4) Seminar in Linguistics.** Guided research in selected topics. (a) Syntax/semantics. Prerequisite: 408. (b) Generative phonology. May be taken singly. Prerequisite: 405 and 408.
- 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.
- 580-3 Seminar in Special Problems of EFL / ESL.** Prerequisite: 570.
- 581-4 (2,2) Practicum in EFL / ESL: Oral English.** Class observation and supervised practice teaching in English as a foreign language; meets concurrently with Linguistics 100. May be taken singly. Graded S/U only. Prerequisite: consent of department.
- 585-4 (2,2) Practicum in EFL / ESL: Written English.** Objectives, methods, and materials for Linguistics 101, 102, and 103 and similar courses. Observation and practice under supervision. May be taken singly. Graded S/U only. Prerequisite: consent of department.
- 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.

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 a 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 equation. Prerequisite: 305. 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. Selected topics from number theory. Prerequisite: 325 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 Godel's theorem. Elective Pass/Fail.

430-3 Projective Geometry. Introduction to plane projective geometry. Study of the extended Euclidean plane as well as such topics as perspectivities, projectivities, involutions, cross ratios, and conics. An axiomatic foundation for projective geometry is included in the course. Prerequisite: 221 and 251. 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. The course will consist of classical differential geometry of curves from the modern viewpoint with emphasis on the Frenet-Serret formulas and will deal with geometric aspects of surfaces motivated by the theory of curves. Topics will include: basic definitions of manifolds; manifolds with a linear connection; Riemannian geometry; sub-manifolds of R^n with emphasis on (Gaussian and Riemannian) curvature. Prerequisite: 251 and 221. Elective Pass/Fail.

437-3 Elementary Algebraic Topology. Topological spaces; continuous maps. Finite products. Connectivity. Path connectivity. Compactness. Local compactness. Separation axioms. Two-dimensional manifolds; orientable vs. non-orientable manifolds. Statement of the classification theorem for compact surfaces. Triangulations of compact surfaces. Euler characteristic. Manifolds with boundary. Classification of compact, connected 2-manifolds with boundary. Homotopic functions: Homotopic paths. Fundamental group. The fundamental group of the circle. Brouwer fixed-point theorem in dimension 2. Fundamental group of a product. Covering spaces: path lifting property. The lifting theorem for arbitrary maps. The homotopy lifting property. Prerequisite: 319.

445-3 Applied Boolean Algebra. (Same as Computer Science 445.) Boolean algebras with applications to logic and circuit theory. Simplification algorithms. Sequential circuits and sequential machines. Prerequisite: 301.

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 and Computer Science 202.

451-3 Introduction to the Theory of Computation. (See Computer Science 451.)

452-4 Advanced Calculus. Fundamental concepts of analysis; infinite series, functions and series of functions, uniform convergence, functions of bounded variation, Riemann-Stieltjes 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 the 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, 319, 335. 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.) Development of the simplex method. Design of models. Introduction to duality theory. Transportation problems. Network flow problems. Postoptimality problems. Applications. 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.

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: 483 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 9 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 either 406 or 421.

510-3 Mathematical Logic. Review of elementary logic; incompleteness and undecidability results of Godel, 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.

520-3 Algebraic Structures. Algebraic field extensions, splitting fields, algebraic closure, separable and unseparable 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.

522-3 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.** (Same as Computer Science 555.) Turing machines and recursive functions. Church's thesis. Solvable and unsolvable problems. Formal languages and their decision problems. Computational complexity classifications. Prerequisite: 451.
- 530-3 General Topology.** Topological spaces, continuous functions, product topology, convergence, separation and countability, compactness, connectedness, local properties, metrizability, compact-open topology. Prerequisite: 433, 452.
- 531-3 Algebraic Topology.** Simplicial complexes. Simplicial approximation. Chain complexes. Simplicial homology. Singular homology. Applications to spheres and Euclidean spaces. Universal coefficient theorem. Cohomology. Prerequisite: 419, 433, or 530.
- 532-3 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.
- 552-3 to 9 per topic (3, 3, 3) Special Topics in Analysis.** (a) Harmonic Analysis. (b) Approximation Theory. (c) Advanced Complex Variables. Prerequisite: consent of instructor.
- 553-3 to 9 (3, 3, 3) Special Topics in Functional Analysis.** (a) Topological Vector Spaces. (b) Operator Theory. (c) Banach Algebras. (d) Integration Theory. (e) Distribution Theory. (f) Abstract Harmonic Analysis. Prerequisite: consent of instructor.
- 555-3 Complex Variables.** Extended complex plane; Cauchy-Riemann equations; conformality; analytic continuation; power series; elementary functions; Cauchy integral theorem and consequences; Cauchy integral formula; maximum modulus principle; Liouville's theorem; 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. Pontryain's necessary condition and its application to control theory and to the classical problems of the calculus of variations. Prerequisite: 452.
- 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-Infinately 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 four 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 unless otherwise indicated in the course description.

400-2 to 12 (2 per semester) Medprep Seminar. Seminar on social, professional, and scientific issues of interest to students planning a career in medicine. 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.

401-1 to 3 (1, 1, 1) Medprep Basic Tutorial. Focus on reading and learning skills, testmanship, verbal communication, general mathematics, English, and other skills critical for academic success in preprofessional and professional training. Required of all students for one semester upon starting program. Not for graduate credit. Prerequisite: restricted to Medprep students.

402-1 to 6 (1, 1, 1, 1, 1, 1) Medprep Special Problems. Seminars, workshops, lectures, and field experiences related to preparing the student for medical school and careers in medicine. Sections: (a) MCAT Preparation; (b) Journal Club; (c) Clinical Experience; (d) Independent Research; (e) Independent Readings; (f) Other. 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.

403-1 to 12 (1 to 2; 1 to 2; 1 to 2; 1 to 2; 1 to 2; 1 to 2) 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 12 (1 to 2; 1 to 2; 1 to 2; 1 to 2; 1 to 2; 1 to 2) Medprep Chemistry Tutorial. Depending on individual need content will be remedial, supplementary to concurrent preprofessional chemistry courses (Chemistry 222a,b; 344 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 applications of these principles to the symptomatology, diagnosis, treatment, and control of the more common bacterial infections of man. Two hours lecture. Fall semester. Prerequisite: 302.

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 of viruses to cancer; consideration of selected viral diseases of animals. Prerequisite: 302.

442-2 Virology Laboratory. Tissue culture methods, multiplication and assay of animal and bacterial viruses, purification, electron microscopy, interference, immunity. Five hours laboratory. Prerequisite: 441 or concurrent enrollment.

451-3 Immunology Lecture. Natural and acquired immunity. Antigens, antibodies, and antigen-antibody reactions in vitro and in vivo. Three hours lecture. Prerequisite: 302.

452-2 Immunology Laboratory. Natural defense mechanism and immune response, preparation of antigens and antibodies, serological reactions, conjugated antibodies, electrophoresis, immunological reactions in vivo. Five hours laboratory. Prerequisite: 451 or concurrent enrollment.

460-3 Genetics of Bacteria and Viruses Lecture. Genetic mechanisms, mutation, transformation, recombination, transduction, lysogeny, phenotypic mixing, and reactivation phenomena. Three hours lecture. Prerequisite: 302.

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: 4.0 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.

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. 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. 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. 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. Prerequisite: 541.

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.

599-1 to 3 Thesis. Prerequisite: consent of instructor.

600-1 to 12 Dissertation.

Molecular Science

592-1 Colloquy in Molecular Science. Required each semester of all resident students who have been admitted to advanced study in molecular science. Weekly conference on current research and recent literature of the field.

597-2 to 30 Selected Topics in Molecular Science. Prerequisite: 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 Medieval, 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. (a) Theories and techniques for therapeutic and recreational use of music with physically and mentally handicapped children. Includes keyboard, autoharp, guitar, and tuned and untuned classroom instruments. (b) Applications for the gifted, emotionally disturbed, and culturally disadvantaged child. Take in sequence. Prerequisite: 302 or prior consent of instructor.

460-4 (2, 2) Music Aesthetics and Appreciation. (a) Nature and significance of music in the life of Man. Critical theory in the writings of philosophers of music and art from Plato through Dewey and Cage. (b) Principles and methods for teaching music appreciation in secondary schools and colleges; theories upon which various methods and principles are based.

461-4 (2, 2) Applied Music Pedagogy. (a) Beginning. (b) Advanced. 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. Take in a,b sequence.

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.

473-2 Piano Literature. A study of piano literature from its beginning to the present, including an introductory study of early harpsichord music.

474-2 Organ Literature. A survey of music for the organ in relation to the history of the instrument, from the Middle Ages to the present.

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: 357-6 and, if graduate music major, completion of graduate examination in music history or deficiency requirements. 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: 357-6 and, if a graduate music major, completion of graduate profi-

ciency examination in music history or deficiency requirements. 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: 357-6 and, if a graduate music major, completion of graduate proficiency examination in music history or deficiency requirements. For non-music majors: prior consent of instructor.

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 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.

501-2 Music Bibliography. Development of acquaintance with basic bibliographical and historical research materials and techniques in music theory, literature, and education.

502-4 (2, 2) Analytic Techniques. Analysis of representative works chosen from the Baroque, Classical, Romantic, and Modern eras. Prerequisite: satisfactory completion of graduate proficiency examination in music theory or deficiency requirements.

503-2 Evaluation in Music Education. Theory, techniques, and procedures for evaluating musical aptitude and achievements; survey of current research investigations in music education. A minor 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.)

545-4 (2, 2) 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. Administrative 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 and/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, as feasible. Prerequisite: 317 or 318 and graduate standing in music.

560-2 Seminar in Music Education. Trends, current practices, philosophies of music education.

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 full time 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: completion of graduate proficiency examination in music history or deficiency requirements. 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: completion of graduate proficiency examination in music history or deficiency requirements. 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:** completion of graduate proficiency examination in music history or deficiency requirements. 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:** completion of graduate proficiency examination in music history or deficiency requirements. For non-music majors: prior consent of instructor.

579-3 to 6 (3, 3) Seminar in Music History and Literature. Intensive study of the works and historical implications of selected composers or the features of particular styles. **Prerequisite:** completion of graduate proficiency examination in music history or deficiency requirements. 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 representing the historical and stylistic implications of works performed in Graduate Recital (Music 598), or other topic relating to the student's principal performing area, to be submitted as evidence of research capability by candidates specializing in performance or opera-music theater. **Prerequisite:** 501 and prior approval of topic by the Graduate Committee. An original musical composition to be performed on the Graduate Recital and accompanying written analysis may be substituted, upon recommendation of the composition faculty and with prior approval of the Graduate Committee.

598-4 Graduate Recital. Preparation and presentation of a full solo recital in any applied field. **Prerequisite:** completion of at least four credits in 540 and approval of the applied jury.

599-2 to 6 Thesis. A written report representing intensive experimental, philosophical, or historical investigation, or composition manuscript and parts (and tape recording if feasible). **Prerequisite:** 501 (if written report) and prior approval of topic outline by Graduate Committee.

Occupational Education

419-2 to 12 Occupation 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.

425-3 Introduction to Cooperative Vocational Education. Investigation of competencies required of cooperative education instructors/coordinators. Operational procedures and development of instructional processes for coop programs. Work experience required. Field trips. Transportation expense for work and field trips.

450-1 to 5 Advanced Occupational Skills and Knowledges. Modern occupational practice in selected fields. For experienced professionals seeking advanced techniques in specialized areas of occupational education. **Prerequisite:** intermediate level study in the specialty.

485-3 Principles and Philosophies of Vocational and Technical Education. Team teaching used. Nature and purposes of practical arts, vocational and technical education, their relationships and differences, and the place of each in preparing people for the world of work.

489-3 Defining and Developing Occupational Programs. Identifying, compiling, and organizing occupational data necessary to development and preparation of occupationally related learning experiences.

490-3 Preparing Occupational Course Materials. Development and preparation of occupationally related learning experiences.

492-2 to 5 Special Problems. Assistance and guidance in the investigation and solution of occupational education problems. **Prerequisite:** consent of instructor and coordinator.

494-2 to 6 Practicum. Applications of occupational skills and knowledge. Cooperative arrangements with corporations and professional agencies provide opportunity to study under specialists. **Prerequisite:** 20 hours in specialty.

500-3 Research in Occupational Education. Basic research methods and techniques in the design, investigation, and reporting of research studies relating to occupational education.

501-3 Legislation, Organization, and Application of Occupational Education. Historical and contemporary thought and practice regarding federal and state legislation for occupational education in sundry institutions. Legislators are used as resource persons. Required for supervisors.

502-3 Evaluation of Occupational 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.

505-6 (3, 3) Policy Implementation and Supervision of Occupational Education. 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.

510-3 Planning Occupational Education Facilities. Principles and practices of planning classrooms and laboratories for occupational education programs. How to work with administrators, staff, and paid professionals to assure judicious location and design of facilities.

519-1 to 16 Internship. Supervised professional experiences in appropriate occupational education settings.

525-3 Cooperative Vocational-Technical Education. Team teaching used. Interrelated cooperative programs as they are developed in America, and especially Illinois, are presented. Coordinators' duties and responsibilities along with the operation of interrelated vocational cooperative programs are featured.

526-3 Cooperative Post-Secondary Occupational Education. Managing specialized occupationally related programs, including work-study, internships, and clinical experiences in diverse post-secondary occupational education settings.

541-3 Occupational Information. The role of instructional and supervisory occupational education personnel in the total occupational information system. Kindergarten to adult.

550-3 Occupational Education in Diverse Settings. Similarities and dissimilarities of occupational education programs in public/private, civilian/military, union/management, and other settings. Expectations of instructional and supervisory personnel. Professional contributions of post-secondary teachers.

560-1 to 9 New Developments in Occupational Education. Recent developments and trends in occupational education, presented by recognized authorities for discussion and review.

575-3 Characteristics of Occupational Education Clientele. Familiarization with the characteristics and programming needs of clientele served by occupational education programs.

581-3 Occupational Education Planning and Policy Development. Survey of models and techniques for occupational education planning and policy development at local, state, and national levels. Examination of research design and data collection procedures for formulating strategies and implementing occupational programs and management information systems.

589-3 Articulated Occupational Education Programs. To familiarize educational leaders with techniques and methods of organization for articulating school-employer-home-community based delivery systems vertically and horizontally along the education ladder.

593-2 to 6 Special Investigations.

599-2 to 6 Thesis.

600-1 to 36 (1 to 16 per semester) Dissertation.

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.

406-3 Philosophy of Biology. Leading concepts of biological sciences: species, evolution, life, organism and part, etc. Abstract ideas of biology are related, wherever possible, to specific experiments recorded in scientific literature. Prerequisite: 300 or 320, and three laboratory or field courses in the biological sciences or consent of instructor. 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. 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-Lowneheim. 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.

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. Prerequisite: GSC 207 and six courses in music, painting, sculpture, literature, or drama. 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 of 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 seniors and graduates 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 for individual study and papers or for group study. Prerequisite: consent of instructor required in all cases. Elective Pass/Fail.

496-2 to 4 Independent Studies in Classical Studies. (See Classical Studies 496.)

497-8 (4, 4) Senior Seminar. Topic varies. Enrollment restricted to undergraduates, with preference to those in their senior year. Not for graduate credit. Prerequisite: consent of department. Elective Pass/Fail.

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.

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.

575-6 (3, 3) Phenomenology and Existential Philosophy. (a) Phenomenology. The phenomenological tradition and its contemporary transformations. (b) Existential Philosophy. Classical works of existentialism.

577-6 (3, 3) Pragmatism. (a) Metaphysics. (b) Value Theory.

581-3 Plato. Thorough study of several of the dialogues. System 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 Hegel.

588-3 Kant.

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.

599-2 to 6 Thesis. Minimum of four hours to be counted toward 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; structure and use of tests; administering the testing program; and interpretation and application of results. Fulfills the tests and measurements course requirements for the Master of Science in Education degree.

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 The Adaptation of Physical and Recreational Activities for the Special Student. 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. Teaching methods, officiating, organization, safety precautions, and selecting equipment for sports.

407-2 Advanced Theory and Techniques in the Prevention and Rehabilitation of Athletic Injuries. Theoretical and practical methods of preventing and treating athletic injuries.

408-2 Physical Fitness: Its Role and Application in Education. Improvement of programs and teaching techniques involved in the development of various aspects of physical fitness. Units on postural status; body weight control; tension factors, causes, and control; exercise tolerance; and general body mechanics and control.

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. Prerequisite: consent of instructor.

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.) History and evolution of dance; place of dance in education. Prerequisite: GSE 113d or Physical Education for Women 115h and 240.

418-2 Administration of Aquatics. To develop an awareness of comprehensive aquatic program and how to implement and coordinate its many facets.

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. Prerequisite: consent of adviser and department chairman, and written report.

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.

500-3 Techniques of Research. Critical analysis of research literature; study of research methods and planning research studies. Prerequisite: 400 or concurrent registration in 400 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 learning 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. Prerequisite: consent of instructor.

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, consent of department.

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 354 or Physical Education for Women 353 or equivalent or consent of instructor.

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.

590-1 to 4 Readings in Physical Education. Supervised reading in selected subjects.

592-3 Research Projects in Physical Education. Planning, conducting, and reporting original research studies. Prerequisite: 500 or equivalent.

599-3 to 6 Thesis.

600-1 to 32 (1 to 16 per semester) Dissertation. Minimum of 24 hours to be earned for the Doctor of Philosophy degree.

Physics

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, consent. 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, 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: 300, either of 350 or 351, or consent of instructor. Elective Pass/Fail.

470-1 to 3 Special Projects. Each student chooses or is assigned 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.

520-6 (3, 3) Electromagnetic Theory. Determination of static, electrostatic, and magnetostatic fields. Microscopic and macroscopic theory of insulators and conductors. Maxwell's equations; radiation, propagation and scattering of electromagnetic waves. Electrodynamics and special theory of relativity. 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: 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.

411-5 (2, 3) 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 three-hour laboratories per week. Prerequisite: consent of instructor.

414-3 Anatomy and Physiology of Speech and Hearing Mechanisms. (Same as Speech Pathology and Audiology 314.) 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.

420-4 Principles of Pharmacology. Action of drugs and other chemical substances on the living organism; pharmacodynamics, chemotherapy, toxicology, and therapeutics. Three lectures and one two-hour laboratory per week. Prerequisite: organic chemistry and basic courses in biology or consent of instructor.

426-3 Comparative Endocrinology. (See Zoology 426.) Prerequisite: Zoology 120a, b and consent of instructor.

430-4 Cellular Physiology. The nature and mechanisms of function of the living cell. Chemical and physical analysis of function at the cellular level. Four lectures per week.

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.

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. Due to limited facilities, permission of the instructor is required. Prerequisite: permission of instructor.

461-3 Biomedical Electronics. Practical experience with modern electronic circuits and devices used for biomedical purposes, with circuit construction and troubleshooting practice. Two lectures and one two-hour laboratory per week. Prerequisite: Electrical Science and Systems Engineering 461 or equivalent and permission 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.

500-1 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 concept 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 two 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.

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.

405-3 Plant Breeding. Principles of plant breeding emphasized together with their application to the practical breeding of agronomic, horticultural, and forest plants. 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: 109. 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: one course in introductory biology or equivalent. Elective Pass/Fail.

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 Turf Management. Principles and methods of establishing and maintaining turf for homes, recreational areas, and public grounds. Study of basic plant and soil materials, fertility, culture, water management, and pest control as related to turf-grasses in variable environments. Prerequisite: a biology course.

423-3 Greenhouse Management. Principles of greenhouse management controlling environmental factors influencing plant growth; greenhouses and related structures; and greenhouse heating and cooling systems. Student financed field trip required. 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. Student financed field trip required. Prerequisite: 423 or consent of instructor. Elective Pass/Fail.

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. 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.

436-4 Fruit Production. Deciduous tree and small fruit growing, physiology, management practices, marketing. Field trips. Prerequisite: 220 or concurrent enrollment.

437-4 Vegetable Production. Culture, harvesting, and marketing of vegetables; with morphological and physiological factors as they influence the crops. Prerequisite: 220 or consent of department. Elective Pass/Fail.

441-3 Soil Morphology and Classification. Development, characteristics, and identification of soils; study of soil profiles; and interpretation and utilization of soil survey information in land use planning. Prerequisite: 240.

442-3 Soil Physics. A study of the physical properties of soils with special emphasis on soil and water relationships, soil productivity, and methods of physical analysis. Prerequisite: 240.

443-3 Soil Management. The soil as a substrate for plant growth. Properties of the soil important in supplying the necessary mineral nutrients, water and oxygen and for providing an environment conducive to plant root system elaboration. Soil management techniques that are important in optimizing plant growth. Prerequisite: 240. 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. 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.

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. 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.

547-2 Soil-Plant Relationships. An integrating course to examine edaphic properties in relation to plant growth. A lecture-discussion format will be used to achieve an interdisciplinary approach to such topics as plant nutrition, plant-soil water relations, etc. Prerequisite: basic training in soil and plant sciences.

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. Political ideas which shaped American beliefs and United States governmental systems. Liberal political theorists from John Stuart Mill to the present. Prerequisite: GSB 212 or consent of instructor. Elective Pass/Fail.

406-3 Revolutionary and Socialist Theory. Revolutionary political theorists from Karl Marx to the present. Prerequisite: senior, graduate standing, or consent of instructor. Elective Pass/Fail.

- 407-3 Nationalistic and Sentimental Theory.** Idealistic and nationalistic political theorists from Hegel to the present. 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 (formerly Government 232). 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 (formerly Government 232). 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 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 and Politics in the United States.** (Same as Black American Studies 445.) An analysis of the role of Blacks and Whites in American politics. Topics receiving attention include various forms of political participation, leadership behavior, and analysis of political strategies including the Black Power concept. 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 of 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. Elective Pass/Fail.
- 436-3 Administrative Law.** Law as it affects public officials in carrying out the rights, duties, and necessary functions of the public office. Prerequisite: 340 (formerly Govt 360.) 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 (formerly Govt. 360) 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 (formerly Govt. 360.) 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 (formerly Govt. 232.) 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.

452-3 Politics of Developing Areas. A survey, theoretical and descriptive, of the impact upon politics of the process of development, and the role of the governmental system in the direction and control of development. Prerequisite: GSB 250 (formerly GSB 390.) 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: 213 (formerly Govt. 232.) 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: GSB 250 (formerly GSB 390.) 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: GSB 250 (formerly GSB 390) or consent of instructor. Elective Pass/Fail.

459-3 Government and Politics of Soviet Russia. Dynamics of Soviet government and economy. Prerequisite: GSB 250 (formerly GSB 390) or consent of instructor. Elective Pass/Fail.

460-3 Governments and Politics of South Asia. Politics in India, Pakistan, Ceylon, Nepal. Prerequisite: GSB 250 (formerly GSB 390.) 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: GSB 250 (formerly GSB 390.) 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. Constitutions and the legal and political systems of the two Vietnams. Prerequisite: GSB 250 (formerly GSB 390.) Elective Pass/Fail.

463-3 Government and Politics of China. Internal political, economic, and social development of China. Prerequisite: GSB 250 (formerly GSB 390.) 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: GSB 250 (formerly GSB 390) or consent of instructor. 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: GSB 250 (formerly GSB 390.) 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: 366 (formerly Govt. 392) recommended or consent of instructor. 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 (formerly GSB 390) 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 (formerly Govt. 303) or graduate standing. Elective Pass/Fail.

473-3 International Organization. Development and organization of international government and administrative systems, with emphasis on the United Nations. Prerequisite: GSB 270 (formerly Govt. 303.) Elective Pass/Fail.

475-6 (3, 3) International Law. (a) Rules and practices governing the nations in their relations in peace and war. (b) Investigation of special problems in international law. Prerequisite: GSB 270 (formerly Govt. 303) or consent of instructor. 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: GSB 378 (formerly GSB 345) or consent of instructor. Elective Pass/Fail.

480-3 International Politics. The alignment and conflicts of the major powers in historical and contemporary perspective. Particular emphasis will be placed on the basic interests of the great powers, regional arrangements, spheres of influence, the use of coercion in world politics. 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: GSB 270 (formerly Govt. 303) or History 380 (formerly Hist. 367.) 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: GSB 270 (formerly Govt. 303) or consent of instructor. Elective Pass/Fail.

488-3 International Relations of the Western Hemisphere. Emphasis on the international behavior of Latin American nation-states and/or regions especially related to policy trends and historical and contemporary objectives of the U.S. Prerequisite: 466 (formerly Govt. 450) 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. Student must have at least a *B* average in political science.

501-6 (3, 3) Methods of Empirical Research. (a) Selected topics concerning the philosophy of science, methods of data acquisition and preparation, and research design as related to research in political science. **(b)** Applied statistics and techniques of data analysis used in political science research.

502-3 to 6 (3, 3) 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. Prerequisite: consent of 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 advance 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 courses, related training, or consent of instructor.

514-3 Seminar in American State Politics. Student should see Director of Graduate Studies for advance syllabus. Prerequisite: 414 (formerly Govt. 466) or consent of instructor.

515-3 Seminar in Urban Politics. Student should see Director of Graduate Studies for advance syllabus. Prerequisite: 415 (formerly Govt. 467) 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 (formerly Govt. 495) 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 of 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 alternative approaches to policy analysis. Students will design and execute an analytical project applying a policy analysis technique to a substantive policy area.

547-6 (3, 3) Topical Seminar in Public Administration. (a) Devoted to comparative public administration. (b) In-depth study of selected problems of public administration. Prerequisite: 441 (formerly Govt 461) 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 (formerly Govt 472) or consent of instructor.

575-3 Seminar in International Law. Student should see Director of Graduate Studies for advance syllabus. Prerequisite: 475a or consent of instructor.

577-3 to 6 (3, 3) Topical Seminar in Foreign Policy. Topic will vary with instructor. Student should see Director of Graduate Studies for advance syllabus. Prerequisite: basic courses, related training, or consent of instructor.

580-3 to 6 (3, 3) Topical Seminar in International Relations. Topic will vary with instructor. Student should see Director of Graduate Studies for advance syllabus. Prerequisite: basic courses, related training or consent of instructor.

590-1 to 6 Readings. Supervised readings in selected subjects. Prerequisite: 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 departmental graduate staff. Prerequisite: consent of instructor.

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 36 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.

409-3 History and Systems of Psychology. A review of the conceptual and empirical antecedents of modern psychology. Prerequisite: senior status.

411-3 Principles of Training. An in-depth coverage of practical problems concerned with training to which the principles of learning derived from pure laboratory investigations can be applied. Prerequisite: 309.

415-3 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 action on the nervous and endocrine systems. Prerequisite: GSA 302.

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: 305 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 301, 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.

510-3 Stimulus Control of Behavior. Reviews the 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.

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.

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.

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.

515-3 Theory and Research in Cognitive Psychology. A detailed survey of current studies of attention, short-term memory, and thought processes.

522-11 (4, 4, 3) Experimental Design and Analysis. A relatively detailed treatment of the rationale for quantitative methods in psychological research: (a) Bayesian methods of inference with frequency and measurement data; (b) experimental design and the analysis of variance. (c) Complex designs and extensions of the analysis of variance. Must be taken in a,b,c sequence. 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.

525-3 Mental Test Theory. Intensive coverage of such topics in test-theory such 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.
- 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, judgemental accuracy, and judgemental 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.

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 chairman.

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; **(l)** Teaching of Psychology. Graded *S/U* only. Prerequisite: consent of instructor.

595-1 to 12 Internship. Placement in an approved setting required of all students in clinical, bio-clinical, and counseling psychology.

597-1 to 15 Preprofessional Training. Experience given in research, teaching, or clinical or counseling activities. One hour required each semester of residence.

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.

599-1 to 6 Thesis.

600-1 to 24 Dissertation.

Public Visual Communications

The Departments of Cinema and Photography and Radio-Television offer 400-level courses toward the Master of Arts degree in public visual communications.

500-2 Introduction to Graduate Study in Public Communications. Introduces students to scope and methods of scholarly research and creative publication in public communications. Comparison of research methods, assignments in source location, abstracting of materials, original research, and organization and preparation of written and oral reports on findings. Note: 500 and 501 are prerequisite to all other courses in the public visual communications program.

501-2 Seminar: Visual Communications. An overview of the materials, techniques, and elements of the grammar and theory of visual language and communications. Note: 500 and 501 are 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, 501.

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, 501.

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, 501.

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, 501.

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, 501.

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, 501.

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, 501.

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, 501.

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, 501.

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, 501.

574-3 Contemporary Film Theory. Analysis of film relativity, cinesemiotics, and structuralism. Students purchase texts. Prerequisite: 500, 501.

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, 501.

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, 501.

591-1 to 3 Individual Study in Public Communications Arts. Supervised research or independent investigative projects. Area of study to be determined by student in consultation with Public Visual Communications faculty. Prerequisite: 500, 501.

597-2 to 6 Production Seminar: Cinema, Photography, and Television. Individual or production-team projects in motion picture, photographic, or television production. Prerequisite: 500, 501.

599-3 to 6 Thesis. Thesis requirements may be satisfied by the presentation of a traditional written thesis or through production of a creative project in cinema, still photography, or television. A minimum of three hours and a maximum of six hours will be counted toward degree requirements. Prerequisite: 500, 501, 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 are 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. 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 children's programming. Prerequisite: C grade in 300M, 300P, and 383; 340.

489-2 to 6 Radio Television Workshop. Advanced study in various areas of radio-television and interrelated disciplines. Offered summer session only. 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.

420-3 Management and Maintenance of Recreation Areas and Facilities. All phases and principles of development, maintenance, and construction of areas and facilities used in a recreation setting. Stress is put on selection and supervision of maintenance personnel. There is a maximum fee of \$5.00 for course materials in lieu of textbook.

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.

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: consent of instructor.

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 various recreation settings such as community, park, school, agency, and institutional, both public and private. Prerequisite: 16 hours of recreation and consent of instructor.

500-3 Principles of Recreation. Principles and interpretations 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.

515-3 Outdoor Education Workshop. Leadership development for outdoor education and its place in the school program. Methods of utilization of natural and cultural resources for the enrichment of school curriculums. Expenses for required field trips not to exceed \$20.00.

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.

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.

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.

550-3 Research in Recreation. Critical analysis of the most significant research studies in park and community, special populations, commercial and outdoor recreation. Prerequisite: 500, Educational Administration and Foundations 500.

560-3 to 12 (3 per topic) Seminar in Recreation. Discussion of major issues, trends, and cultural, economic, and social significance as well as evaluation and implementing recreation programs in (a) park and community, (b) special populations, (c) outdoor recreation, and (d) commercial. Maximum of six hours to count toward master's degree.

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.

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.

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.

599-1 to 3 Thesis. Prerequisite: consent of instructor.

Rehabilitation

Courses in this unit may require purchase of additional learning aids.

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.

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.

451-4 General Rehabilitation Counseling. A didactic and experiential analysis of the underlying premises and procedures of individual and group counseling in rehabilitation settings.

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.

501-2 Rehabilitation Foundations. Review of the historical, social, cultural, and economic factors in the development of rehabilitation legislation, plans, and current programs.

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 limitation 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. Thorough familiarization and practice with independent assessment devices used in program selection and job placement of individuals with various handicaps. Prerequisite: 431 and consent of instructor.

533-2 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.

536-3 to 4 Work Evaluation and Work Adjustment. Work evaluation methodology encompassing psychometric testing, functional behavioral analysis, work sampling, situational assessment, and on-the-job evaluation, including consideration of the major systems of work evaluation; e.g., TOWER, JEVS, Singer Graflex, and an introduction to such work adjustment techniques and systems as those of JVS, Goodwill, etc. Prerequisite: 533 and 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.

553-3 Learning Therapies for Special Populations. Describes treatment, rehabilitation, and teaching procedures with the emotionally disturbed, problem drinkers, mentally retarded, and with 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 schedules to human and social needs. Prerequisite: consent of instructor.

562-3 Rehabilitation Workshops and Developmental Centers. Surveys the history and development of rehabilitation workshops 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 behavioral methods of improving teaching and learning. Prerequisite: consent of instructor.

568-3 Sex and Biological Control of Behavior. Biological factors that influence human behavior with special emphasis on sexual development and procedures of evaluating and modifying human sexual responses. 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.

577-2 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 4 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. Graded S/U only. Prerequisite: 585 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.) Not available for graduate credit in religious studies.

441-3 Themes in Greek Tragedies and the New Testament. (See Classical Studies 441.) Not available for graduate credit in religious studies.

496-1 to 4 Honors Readings in Religion. Topics selected by students and instructor which ordinarily are not covered in depth in regular course offerings. Not available for graduate credit in religious studies. Prerequisite: consent of department.

Secondary Education

406-3 Diagnosis and Correction of Reading Problems of Secondary Students. For secondary teachers who desire a knowledge of methods and materials to be used for diagnostic and remedial purposes. Prerequisite: 340 or consent of instructor.

407-4 (2, 2) The Middle and Junior High School. (a) Organization, administration, and curriculum. (b) Problems. Enables teachers to discover and evaluate new content methods and materials available and develops teacher-made functional instructional models.

470-2 Student Activities. Analysis of extra-class activities and programs in secondary schools with a focus on the status, trends, organization, administration, and problems.

480-2 Simulation and Gaming. (See Instructional Materials 480.)

481-3 Advanced Teaching Methodologies. A graduate level course which focuses on new teaching strategies and curriculum materials for the secondary school classroom.

485-2 Problems Related to Teaching Disadvantaged Youth. For those working in classrooms with disadvantaged youth. Emphasis is on four areas: the characteristic of the disadvantaged; the student's attitude regarding the disadvantaged; effective teaching strategies for the disadvantaged; and microteaching videotaped lessons of appropriate teaching styles.

487-2 Teaching the Natural Sciences in Secondary Schools. Organized on a contract and option basis. Objectives of science education; instruction methods and techniques appropriate for teaching science; development of teaching skills through micro-teaching; development of instruction unit.

488-2 Principles and Trends in Social Studies Education. Evaluation and study of the curricular, organizational, and instructional trends in social studies at the junior high, senior high, and community college level.

490-3 Workshop in Economic Education. (See Economics 490.) Elective Pass/Fail.

498-2 to 6 Field Study Abroad. Orientation and study before travel, readings, reports, and planned travel. Includes visits to cultural and educational institutions.

506-3 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. Prerequisite: student teaching.

508-3 Current Developments in Selected Subject Areas in Secondary Schools. Problems, issues and trends, in the subject areas of the secondary school related to the student, the curriculum, the school organization, the staff, materials and media, and the school building. Also considered is the process of innovation and change.

510-3 Seminar: Problems in Secondary Reading. Major field content seminar: problems and practices; comprehensive review and evaluation of research and literature. Each student pursues a problem of his own interest. Prerequisite: 506.

511-3 Curriculum Organization. (Same as Educational Administration and Foundations 511.) The nature and organization 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.

514-3 Organization and Administration of Reading Programs. (Same as Elementary Education 514.) For reading specialists, consultants, supervisors; for principals, administrators. Recent trends, research in organization, administration of reading programs, K-junior college; materials, equipment, budgeting for special programs; study of roles of various personnel; in-service training programs. Specific problems of class members are studied. Prerequisite: 506 or Elementary Education 505.

518-3 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. A course for present and prospective teachers who wish to effectively deal with students in the various professional educational experiences.

521-8 (4, 4) Diagnosis and Correction of Reading Disabilities. (Same as Elementary Education 521.) 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: 506 or Elementary Education 505 or consent of instructor.

562-3 Secondary School Curriculum. Developments in secondary education. Bases of the curriculum of the secondary school.

564-3 Secondary School Principalship. (Same as Educational Administration and Foundations 507.) Deals with problems met specifically by the high school principal. Emphasizes his/her role in relation to guidance, curriculum, schedule-making, extra-curricular activities, public relations, budgeting of time, etc.

566-2 Seminar in Instruction. Study and discussion of problems of instruction with attention to experimentation.

571-3 Seminar in Curriculum. Current curriculum issues. Emphasizes the process of curriculum development, evaluation, and implementation in the public school setting. Prerequisite: 562, Elementary Education 561 or equivalent.

572-3 Seminar: Research and Evaluation in Secondary Education. Critical analysis of evaluation techniques and significant research in organization, learning, teaching, and curriculum in secondary education.

588-3 Social Studies Education in the Secondary School Curriculum. Evaluation of the current professional literature in the curriculum and teaching of secondary school social studies. For improving classroom teaching practices, curriculum design, and in-service programs.

590-1 to 6 (1 to 2 per topic) Readings. Readings in the literature under the personal direction of a member of the departmental graduate staff in one of the following areas: (a) Curriculum,

(b) Supervision, (c) Language Arts, (d) Science, (e) Reading, (f) Social Studies, (g) Problems in Secondary Education, (h) Junior High School Methods, and (i) Instruction. A maximum of six hours may be applied toward any one graduate level degree offered in the department.

593-2 to 6 (2 per topic) Individual Research. 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, (c) Language Arts, (d) Science, (e) Reading, (f) Social Studies, (g) Problems in Secondary Education, (h) Junior High School Methods, and (i) Instruction.** May be taken for a maximum of two hours in any one area. A maximum of four credit hours may be applied toward a master's and specialist's degree.

594-1 to 6 Practicum. Practical work experience in the design, implementation, and evaluation of educational activities under the personal supervision of a member of the departmental graduate staff in one of the following areas: **(a) Curriculum, (b) Supervision, (c) Language Arts, (d) Science, (e) Reading, (f) Social Studies, (g) Problems in Secondary Education, (h) Junior High School Methods, and (i) Instruction.**

595-1 to 6 Internship. Actual job experience in the public schools under the supervision of a member of the departmental graduate staff and the administrative staff of the cooperating school system in one of the following areas: **(a) Curriculum, (b) Supervision, (c) Language Arts, (d) Science, (e) Reading, (f) Social Studies, (g) Problems in Secondary Education, (h) Junior High School Methods, and (i) Instruction.**

596-2 to 6 Field Work. A field study required of each student working for the sixth-year professional degree. The work should be done in the setting of a school system where the student is employed or where full cooperation is extended. Involves selecting a problem, survey of pertinent literature, recording of results, and appropriate interpretations and summarizations.

597-2 Seminar in Proposal Development. For doctoral students. Student prepares proposal for a doctoral level study in the area of curriculum and instruction. Provides an opportunity for students to interact in the process of designing, evaluating, and implementing educational studies.

598-1 to 6 Workshop in Secondary Education. Designed primarily to help teachers and administrators to work effectively on the problems confronting education.

599-1 to 6 Thesis. Minimum of four hours to be counted toward a master's degree. Prerequisite: Educational Administration and Foundations 500.

600-1 to 32 (1 to 16 per semester) Dissertation. Minimum of 24 hours to be earned for the Doctor of Philosophy degree. Prerequisite: admission to candidacy.

Social Welfare

There is no graduate program offered through social welfare. Four-hundred-level courses in this unit 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.

402-4 Processes in Social Work (Group Work and Community Organization). Analysis of social group work, community welfare organization methods, and interventive techniques. Prerequisite: 375.

404-3 Integrated Methods in Social Work. A team-teaching 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: 481, 482.

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.

421-3 Seminar in Problems and Issues in Social Welfare. Critical evaluation of contemporary social work practice, innovations, social policy, and planning. Prerequisite: 401 and 402.

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 16 hours per week of supervised experience in a social agency with concurrent weekly seminar. Not for graduate credit. Prerequisite: 401 and 402 and consent of instructor. Mandatory Pass/Fail.

442-7.5 Advanced Field Practicum. Supervised field work experience in a social agency with concurrent weekly seminar. Sixteen hours per week. Not for graduate credit. Prerequisite: 441 and consent of instructor. 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: permission 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 a 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: permission of instructor.
- 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: permission 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: permission 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: permission of instructor.
- 496-1 to 3 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: two courses in sociology 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: two sociology courses 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: GSB 321, Psychology 301, or Psychology 307, 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: two sociology courses 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 under-developed, characteristics of rural populations and institutions; rural development analyzed functionally and historically. Prerequisite: two sociology courses or consent of instructor. Elective Pass/Fail.
- 450-4 Social Thought.** Traces the historical development of sociology from its beginnings in the Enlightenment to the classical expositions of the early 20th Century.
- 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: two sociology courses 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: two sociology courses or consent of instructor. Elective Pass/Fail.

471-4 Demography and Ecology. The demographic focus includes basic techniques and selected issues in population studies. The focus upon human ecology concerns the spatial and temporal organization of population and institutions with special reference to the organization of rural and metropolitan communities. Research applications will be emphasized. Prerequisite: two sociology courses 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: GSB 203 and Sociology 302 or 372. 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: two sociology courses 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 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 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: consent of department. 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 to 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 of instructor.

526-8 (4, 4) Quantitative Methods in Sociology. (a) Linear causal models as a tool in theory and research. Central tendency, variation, covariation, and correlation. Bivariate and multivariate regression models. Path analysis and related techniques. Bivariate and multivariate statistics for nominal and ordinal measures. (b) Application of linear models. Linear models of measurement error, reliability and validity. Models of reciprocal causation feedback and control. The identification problem. Must be taken in a,b sequence. Prerequisite: graduate standing.

529-4 Sampling and Inference in Social Research. Probability. Sampling distributions. Sampling designs. Point and interval estimation. Analysis of variance. Hypothesis testing: parametric and nonparametric approaches. Power and efficiency of statistical tests. Prerequisite: consent of instructor.

530-2 to 4 Selected Topics in Social Research. Problems in design, execution, and analysis of social research. Content varies with interests of instructor and student. 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 disinte-

gration 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.

574-4 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. Prerequisite: Psychology 301 or 303 or consent of instructor.

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 consent of instructor.

402-3 Problems and Characteristics of the Mentally Retarded Child. Emphasizes a developmental approach to understanding and dealing with children with low mental abilities. Considers historical, theoretical, and practical factors pertinent to mental retardation. Prerequisite: 400 or consent of instructor.

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 consent of instructor.

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 consent of instructor.

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. Prerequisite: 400.

413-2 Directed Observation of Handicapped Children. Student observation and participation in group and individual work with handicapped children. Prerequisite: 411 or consent of instructor.

420-3 Methods and Materials for Teaching Elementary Level Handicapped Children. Methods and materials needed for remedial education of children with behavior disorders, learning disabilities, and reduced mental ability. Prerequisite: 411 and 410a, b, or c.

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: 410a, b, or e, consent of instructor.

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 and consent.

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: 420.

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: 420, 421.

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, consent of instructor.

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.

511-3 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, consent of instructor.

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 selection 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 given to services rendered and to method of contact and cost. 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. 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

Courses in this department may require the purchase of additional textbooks or materials.

401-2 Introduction to Theories and Models in Communication. An introduction to social science applications to communication research, including systems theory, basic research design, and research reporting. Emphasis is placed on the examination of existing communication theories and models as well as the generation of new models.

402-2 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 American Public Address I. Critical studies of speakers, movements, and issues which reflect dominant social and political ideas in American history to 1850. Prerequisite: for undergraduates, 311 or consent of instructor.

422-3 American Public Address II. Critical studies of speakers, movements, and issues which reflect dominant social and political ideas in American history from 1850 to 1918. Prerequisite: for undergraduates, 311 or consent of instructor.

423-3 Contemporary Public Address. A critical study of speakers and speeches selected to present the characteristic ideas of leading social and political developments in national and international affairs since 1918. A lecture, reading, and discussion course. Prerequisite: for undergraduates, 311 or consent of instructor.

424-3 British Public Address. Critical study of British speakers. Selection of material will be governed both by men and the issues that moved men throughout British history. Prerequisite: for undergraduates, 311.

425-2 Studies in Argumentation. An in-depth study of advanced argumentation theory and an application of that theory to contemporary problems in advocacy. Prerequisite: for undergraduates, 325.

430-3 Speech in Elementary Schools. Survey of normal speech development with emphasis on the elementary school years. Concept of speech as skill basic to reading, writing, and spelling. Psychological and sociological variables affecting language as it relates to school learning. Speech experiences supportive of the child's linguistic, intellectual, and social development.

431-3 Speech in Secondary School. Philosophy of speech education, and effective teaching

of speech through curricular and extra-curricular work. Prerequisite: twelve hours of speech.

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. Prerequisite: 325, GSC 200.

433-3 Creative Dramatics. 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, observation, student participation. Prerequisite: junior standing.

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.

442-2 Psychology of Speech. Nature, development, and functions of speech behavior; application of psychological theories and research to the communication process in individuals and groups.

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.

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.

452-2 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. 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.

462-3 Laboratory in Interpersonal Communication II. 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.

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.

480-2 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.

491-1 to 3 Independent Study. Creative project to be completed in one semester. Nature of assignment determined by student and instructor and approved by department chairman. Prerequisite: twelve hours of speech courses and consent of instructor.

495-2 to 8 Internship / Practicum in Public Relations. A professional semester for selected students specializing in public relations. Supervised by the director of public relations education and the PR group of a corporation, institution, agency, or counseling firm. Credit depends on the demands and complexity of the work the student performs. Evaluation is a joint function of the group professionals and the director. Prerequisite: selection by the director of public relations education.

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.

510-4 Survey of Rhetoric. Survey of early rhetorical heritage. The study of major contributors to rhetorical theory during the classical and medieval-renaissance periods.

511-3 Modern Rhetorical Theory. An analysis of selected theories of rhetoric and public address from the 18th Century to the present.

512-3 Seminar: Rhetoric and Public Address. A study of selected areas of speech criticism and rhetorical theory.

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.

530-3 Speech of Minority Children. For teachers of young children and students of language. Emphasis on environmentally derived language differences. Theory of speech development and use, the function of speech in the socialization and education of the child, and practice in developing speech experiences which contribute to school success.

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.

539-2 Speech at University Level. Analysis and practice of teaching methods. Focus on the development of teaching skills with specific applications to teaching the basic college speech 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 Seminar: Studies in Discussion. Studies of group action and interaction designed to improve discussion and conference techniques.

562-2 Philosophical Foundations of Speech. Philosophical traditions of classical realism, logical positivism, instrumentalism, and existential phenomenology are discussed relative to the development of the field of speech. Critical analysis is made of the various perspectives of speech/communication as they relate to their concepts of Man and the world.

563-3 Laboratory in Small Group Communication. Course focuses on the application of small group theory and communication theory in a laboratory setting. Special emphasis is placed on the dynamics of personal awareness, self-disclosure, feedback, authenticity, confrontation, and expressive and listening skills.

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.

574-2 to 4 (2, 2) Studies in Interpretation. An exploration of selected current topics in the field of oral interpretation. May be repeated for a total of four hours. Prerequisite: twelve hours of interpretation or consent of instructor.

575-3 Seminar: Research Problems in Interpretation. A theoretical and practical examination of research parameters for oral interpretation. Prerequisite: nine hours of interpretation or consent of instructor.

593-1 to 3 Research Problems. Independent research study under the supervision of a member of the graduate faculty in speech. Prerequisite: consent of instructor and approval by director of graduate studies in speech.

598-1 Proseminar in Speech / Communication. An open forum for the discussion of contemporary professional issues and research in the field of speech communication. Specific content is to be determined by participating faculty and graduate students.

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.

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.

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 Rehabilitation. Supervised clinical practicum in hearing rehabilitation. Emphasis will be upon therapy procedures, diagnostic techniques, and preparation of reports. Prerequisite: 316, 419.

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.

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.

512-3 Voice Disorders. An intensive study of the variables of air stream modulation resulting from impaired structures and function of head and neck. Prerequisite: 318 or equivalent.

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.

520-3 Advanced Audiology I. Problems in masked bone conduction audiometry including SAL and Rainville testing; methods of hearing assessment for children and infants; functional hearing loss in children and adults. Also presentation of theoretical and practical aspects of advanced differential auditory tests. Prerequisite: 316.

521-3 Advanced Audiology II. Theory and practice in the application of middle ear impedance measures, electroencephalographic audiometry, electrodermal audiometry, and electro-nystagmography. 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 psycho-acoustic experimentation. Prerequisite: 316, 528 or consent of instructor.

531-1 to 6 (1 to 3, 1 to 3) Experimental Phonetics. An investigation into the experimental approaches for the study of the phenomena of speech; advanced specialized instrumentation; bio-feedback communication; electro-stimulation of hearing; evoked potential; psychophysiological methodology.

533-3 to 6 (3, 3) Seminar: Speech Science. Special problems in speech science. Students may choose from a wide range of speech science topics, such as acoustics, electronic and kinesthetic perception; voice print identification; environmental noise pollution; noise control laws and regulations; artificial and compressed speech. Students may pursue two or three of these in depth. Special instruction on group or individual topics chosen. May be repeated once to a total of six credits 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

402-6 (3, 3) Play Directing. (a) Introduction to the principles and procedures of play direction including play selection, interpretation, and patterning of auditory and visual stimuli. Extensive scene work in class-time workshops; direction of a full one-act play by the end of the semester. **(b)** The director as administrator, interpreter, critic, and artist. Study of theories and practice of directing non-proscenium productions. Students will direct two full one-act plays. Must be taken in a,b sequence except with consent of instructor.

404-3 Theater Management. Discussion of legal and financial aspects concerning the professional and community theaters of the United States. Consideration of and practice in managerial activities of an educational theater including administration, purchasing, and accounting practices, direct sales, publicity, promotion, and public relations.

407-2 Sound in the Theater. Consideration of sound systems design and application of sound in dramatic production. Lecture and laboratory two hours. Prerequisite: 211b or consent of instructor.

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.

410-2 Children's Theater. Study of methods and their practical application of introducing children to theater and theatrical productions as an art form. Recommended for education majors.

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 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 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 for Men or for Women 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.

432-2 Stage 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.

438-2 Contemporary Developments in the Theater. Critical study of theory and practice in acting, directing, production, and architecture in the modern theater. The rise and development of the film, radio, and television as dramatic media.

444-1 to 6 Contemporary Dance Workshop.

489-3 to 6 Theater-Television Workshop. (See Radio-Television 489.)

500-1 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) Stage 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.

511-1 Playwriting Workshop. A practical laboratory course in which playwriting students will have one or more original plays presented in staged readings or, whenever possible, in modified productions. Students will be expected to constantly improve their work before and after presentation, to attend rehearsals, to work closely with directors and actors. Plays will be evaluated by critique panels composed of faculty and students. The workshop gathers a performance group for the presentation of the new plays. The department also produces original plays in its Quarter-Night Series. Restricted to graduate playwriting students in the theater program. Graduates in interdisciplinary programs may be admitted by consent of instructor. Prerequisite: 411A and B.

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 3 Research Problems in Theater. Individual work upon selected problems for research.

599-1 to 6 Thesis. Minimum of three hours to be counted toward a master's degree.

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 environmental relationships, intraspecies communication, and interspecies relationships of invertebrate animals. One lecture and two two-hour laboratories per week. Cost of \$10.00 may be incurred by student. Prerequisite: 120a.

403-3 Natural History of Vertebrates. Observation, identification, and life histories. Designed for teachers. Not for students specializing in vertebrate zoology. Cost of \$10.00 may be incurred by student. One lecture and one four-hour laboratory. Prerequisite: 120b.

406-3 Protozoology. Taxonomy, cytology, reproduction, and physiology of unicellular animals. Laboratory methods of culturing and studying. One lecture and two two-hour laboratories per week. Cost of \$5.00 may be incurred by student. Prerequisite: 120a.

407-3 Parasitology. Principles, collection, identification, morphology, life histories, and control measures. One lecture and two two-hour laboratories per week. Cost of \$5.00 may be incurred by student. Prerequisite: 120a.

408-3 Herpetology. Taxonomic groups, identification, morphology, and natural history of amphibians and reptiles. One lecture and two two-hour laboratories per week. Cost of \$5.00 may be incurred by student. Prerequisite: 120b.

409-4 Vertebrate Histology. Microscopic structure of organs and tissues with emphasis on mammalian material. Two lectures and two two-hour laboratories per week. Cost of \$5.00 may be incurred by student. 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 two-hour laboratory. Cost of \$5.00 may be incurred by student. Prerequisite: 120b.

413-6 (3, 3) The Invertebrates. (a) Structure, phylogeny, and habitats of the lower invertebrates, through lophophorates and lower deuterostomes. (b) Structure, phylogeny, and habitats of the higher invertebrates: higher deuterostomes, and protostomes, inclusive of arthropods. Cost of \$5.00 may be incurred by student. Three two-hour laboratories per week. Prerequisite: 120a.

414-4 Freshwater Invertebrates. Taxonomic groups, identification, distribution, and habitats of the North American freshwater invertebrate fauna. One lecture, one two-hour laboratory and one four-hour laboratory per week. Cost of \$10.00 may be incurred by student. Prerequisite: 120a.

415-3 Limnology. Lakes and inland waters, the organisms living in them, and the factors affecting these organisms. Two lectures and one four-hour laboratory alternate weeks. Cost of \$15.00 may be incurred by student. Prerequisite: 120a.

421-4 Histological Techniques. Student will study methods of preparing material for microscopic study and theories of staining and histochemistry behind these methods. One lecture and two three-hour laboratories per week. Cost of \$10.00 may be incurred by student. Prerequisite: 10 semester hours of a biological science.

426-3 Comparative Endocrinology. (Same as Physiology 426.) 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 two-hour laboratory per week. Cost of \$5.00 may be incurred by student. Prerequisite: consent of instructor.

441-3 Emergence of Order in Biological Systems. From the molecular to any desired higher level of biological organization: systemic, cybernetic, evolutionary, and thermodynamic principles. Two lectures and one two-hour laboratory per week. Cost of \$5.00 may be incurred by student. Prerequisite: consent of instructor.

459-3 Game Birds. Identification, life history, ecology, and management. Cost of field trips up to \$15.00 per student. One lecture and one four-hour laboratory per week, three or four of which will be Saturday laboratories. Prerequisite: 120b.

461-3 Mammalogy. Taxonomic groups, identification, and natural history of mammals. One hour lecture and two two-hour laboratories per week. Cost of \$5.00 may be incurred by student. Prerequisite: 120b.

465-3 Ichthyology. Taxonomic groups, identification, and natural history of fishes. Two lectures and one two-hour laboratory per week. Cost of \$5.00 may be incurred by student. Prerequisite: 120b.

466-3 Fish Management. Sampling, age and growth, dynamics, habitat improvement, manipulation of fish populations and management of marine fish stocks. Cost of field trip up to \$15.00 per student may be incurred. Two lectures per week and one four-hour laboratory alternate weeks. Prerequisite: 10 hours of biological science and consent of instructor.

467-3 Ornithology. Classification and recognition of birds and the study of their songs, nests, migratory habits, and other behavior. Cost of field trips may be up to \$15.00 per student. One lecture and two two-hour laboratories per week. Prerequisite: 120b.

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 one-hour lectures per week. (b) Techniques. Two two-hour laboratory sessions per week, three or four of which will be field trips on Saturdays. Cost of

field trips up to \$15.00 per student may be incurred. 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 two-hour laboratories per week. Cost up to \$10.00 may be incurred by student. Prerequisite: 120a.

479-3 Animal Behavior. The biological basis for the actions and interactions of animals. Two lectures and one two-hour laboratory per week. Cost of \$10.00 may be incurred by student. Prerequisite: GSA 209 or consent 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. 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 per individual will be approximately \$25.00 per week. Prerequisite: consent of graduate committee.

508-2 Helminthology. Identification, structure, physiology, and life history of parasitic worms. Two lectures per week. Prerequisite: consent of instructor.

512-2 Animal Geography. Principles of distribution of the animals of the world. 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. Emphasis on the effects of pollution. Cost of \$10.00 may be incurred by student. Two lectures per week and one four-hour laboratory alternate weeks. Prerequisite: 415 and consent of instructor.

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

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.

542-2 Osteology. Modification of the vertebrate skeleton as a result of growth, functional adaptation, and phylogenetic relationship. One lecture and one two-hour laboratory 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.

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 two-hour meeting per week. Prerequisite: graduate status in a biological science.

585-24 (3, 3, 3, 3, 3, 3, 3, 3) Seminar. Advanced study of special topics in zoology. **(a)** Seminar in Animal Behavior. **(c)** Seminar in Ecosystems. **(d)** Seminar in Wetland Ecology. **(e)** Seminar in Wildlife Ecology. **(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. Investigations in zoology other than those for theses. Only three hours may be credited toward a degree. Some cost 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.

Preceding the graduate faculty is a list of faculty members and students elected to the Graduate Council for the year 1973-1974.

The Graduate Council

WAYNE APPLETON, Graduate Student, Chemistry and Biochemistry
IAN D. BEATTIE, Associate Professor, Elementary Education
JON A. BOOKER, Assistant Professor, Accountancy
RICHARD W. BRADLEY, Associate Professor, Guidance and Educational Psychology
GEORGE C. BROWN, Professor, Journalism
PATRICIA L. CARRELL, Associate Professor, Linguistics
PHILIP DAVIS, Professor, Engineering Mechanics and Materials
ROBERT E. DAVIS, Professor, Cinema and Photography
RUSSELL R. DUTCHER, Professor, Geology
DAVID EHRENFREUND, Professor, Psychology
C. ADDISON HICKMAN, Professor, Economics
SHIRLEY HJORT, Graduate Student, Community Development
MARVIN E. JOHNSON, Professor, Technology
LARRY LAGOW, Graduate Student, Education
HELMUT LIEDLOFF, Associate Professor, Foreign Languages and Literatures
MALVIN E. MOORE, Professor, Educational Administration and Foundations
ALI A. MOSLEMI, Professor, Forestry
ROBERT MUELLER, Professor, Music
ANTHONY J. PACIELLO, Graduate Student, Higher Education
HOWARD J. STAINS, Professor, Zoology
JEFFREY TILDEN, Graduate Student, History
JAMES TYRRELL, Associate Professor, Chemistry and Biochemistry
DONALD R. TINDALL, Associate Professor, Botany
JAMES TYRRELL, Associate Professor, Chemistry and Biochemistry
GOLA A. WATERS, Associate Professor, Finance
HOWARD W. WEBB, JR., Professor, English

Accountancy (College of Business and Administration)

- BARRON, MARY NOEL, Associate Professor, C.P.A., M.B.A., University of Michigan, 1946
BOOKER, JON A., Assistant Professor, C.P.A., Ph.D., North Texas University, 1971
BURGER, CLIFFORD R. Professor, C.P.A., M.S., Indiana State Teachers' College, 1947
ERIKSEN, DOUGLAS C., Associate Professor, C.P.A., Ph.D., University of Missouri, 1968
GALLEGLY, ROBERT L., Associate Professor, A.M., University of Illinois, 1947
SCHMIDLEIN, EDWARD J., JR., Professor, C.P.A., Ph.D., New York University, 1953
SETH, SHIRISH B., Associate Professor, Ph.D., Michigan State University, 1969
SWICK, RALPH D., Professor and *Chairman*, C.P.A., D.B.A., Indiana University, 1954
TUCKER, MARVIN W., Associate Professor, Ph.D., University of Alabama, 1966
WOELFEL, CHARLES J., Professor, C.P.A., Ph.D., University of Texas, 1957
WRIGHT, ROLAND M., Professor, C.P.A., Ph.D., State University of Iowa, 1962

Administrative Sciences (College of Business and Administration)

- BATEMAN, DAVID N., Assistant Professor, Ph.D., Southern Illinois University, 1970
BEDWELL, R. RALPH, Associate Professor, Ph.D., Southern Illinois University, 1969
BISHOP, RONALD C., Associate Professor and *Chairman*, Ph.D., Southern Illinois University, 1969
ELLIS, DENNIS F., Assistant Professor, Ph.D., Wayne State University, 1972
FOHR, JOHN M., Professor, Ed.D., Michigan State University, 1959
HUNT, JAMES G., Professor, Ph.D., University of Illinois, 1966
LARSON, LARS L., Assistant Professor, Ph.D., University of Illinois, 1971
MATTHEISS, T. H., Associate Professor, D.B.A., University of Maryland, 1970
ORESCANIN, DANILO, Professor, D.B.A., Indiana University, 1960
OSBORN, RICHARD N., Assistant Professor, D.B.A., Kent State University, 1971
SHERMAN, A. KIMBROUGH, Assistant Professor, Ph.D., University of Maryland, 1972
VICARS, WILLIAM M., Assistant Professor, Ph.D., Southern Illinois University, 1969
WILSON, HAROLD K., Assistant Professor, D.B.A., University of Colorado, 1972

Agricultural Industries (School of Agriculture)

- HANSON, RONALD J., Assistant Professor, Ph.D., University of Illinois, 1972
HERR, WILLIAM McD., Professor, Ph.D., Cornell University, 1954
HOERNER, HARRY J., Assistant Professor, Ed.D., Oklahoma State University, 1969
KEEPPER, WENDELL E., Professor, Ph.D., Cornell University, 1938
LANGFORD, GORDON L., Associate Professor, Ph.D., Montana State University, 1969

LYBECKER, DONALD W., Assistant Professor, Ph.D., Iowa State University, 1970
 PATERSON, JOHN J., Associate Professor, M.S., University of Saskatchewan, 1943
 SOLVERSON, LYLE, Associate Professor, Ph.D., University of Wisconsin, 1966
 STITT, THOMAS R., Associate Professor, Ed.D., Ohio State University, 1967
 WELTON, RICHARD F., Assistant Professor, Ph.D., Ohio State University, 1971
 WILLS, WALTER J., Professor, Ph.D., University of Illinois, 1952
 WOLFF, ROBERT L., Assistant Professor, Ph.D., Louisiana State University, 1971
 WOOD, EUGENE S., Professor and *Chairman*, Ph.D., University of Missouri, 1958

Animal Industries (School of Agriculture)

GOODMAN, BILL L., Professor, Ph.D., Ohio State University, 1959
 HAUSLER, CARL L., Assistant Professor, Ph.D., Purdue University, 1970
 HINNERS, SCOTT W., Professor, Ph.D., University of Illinois, 1958
 HODSON, HAROLD H., JR., Professor and *Chairman*, Ph.D., Iowa State University, 1965
 KAMMLADE, W. G., JR., Associate Professor, Ph.D., University of Illinois, 1951
 KROENING, GILBERT H., Professor, Ph.D., Cornell University, 1965
 LEE, D. DIXON, JR., Associate Professor, Ph.D., North Carolina State University, 1970
 MARION, G. B., Professor, Ph.D., University of Wisconsin, 1951
 OLSON, HOWARD H., Professor, Ph.D., University of Minnesota, 1952
 STRACK, LOUIS E., Associate Professor, D.V.M., University of Illinois, 1961
 WARING, GEORGE H., Associate Professor, Ph.D., Colorado State University, 1966

Anthropology (College of Liberal Arts)

ALTSCHULER, MILTON, Associate Professor, Ph.D., University of Minnesota, 1964
 BENDER, M. LIONEL, Assistant Professor, Ph.D., University of Texas at Austin, 1968
 COOK, EDWIN A., Associate Professor and *Chairman*, Ph.D., Yale University, 1967
 DARK, PHILIP J. C., Professor, Ph.D., Yale University, 1954
 GERBRANDS, ADRIANUS A., Adjunct Professor, Ph.D., National University, Netherlands, 1956
 GRIMES, J. LARRY, Associate Professor, Ph.D., University of Texas at Austin, 1969
 GUMERMAN, GEORGE J., Associate Professor, Ph.D., University of Arizona, 1969
 HANDLER, JEROME S., Associate Professor, Ph.D., Brandeis University, 1965
 KELLEY, J. CHARLES, Professor, Ph.D., Harvard University, 1948
 MacLACHLAN, BRUCE B., Associate Professor, Ph.D., University of Chicago, 1962
 MARING, ESTER G., Assistant Professor, Ph.D., Indiana University, 1969
 MARING, JOEL M., Associate Professor, Ph.D., Indiana University, 1967
 MULLER, JON D., Associate Professor, Ph.D., Harvard University, 1967
 RANDS, ROBERT L., Professor, Ph.D., Columbia University, 1952
 RILEY, CARROLL L., Professor, Ph.D., University of New Mexico, 1952
 TAYLOR, WALTER W., Professor, Ph.D., Harvard University, 1943

WALKER, MALCOLM T., Assistant Professor, Ph.D., Columbia University, 1970

Art (College of Communications and Fine Arts)

ABRAHAMSON, ROY E., Associate Professor, Ed.D., Columbia University, 1965

ADDINGTON, ALDON M., Assistant Professor, M.F.A., Cranbrook Academy of Art, 1966

BERNSTEIN, LAWRENCE A., Associate Professor, M.F.A., Cranbrook Academy of Art, 1953

BETAUDIER, PATRICK C., Associate Professor, Nat.Diploma, St. Martins College of Art-London, 1957

BOYSEN, BILL H., Assistant Professor, M.F.A., University of Wisconsin, 1966

FINK, HERBERT L., Professor, M.F.A., Yale University, 1958

GREENFIELD, SYLVIA R., Assistant Professor, M.F.A., University of Colorado, 1967

JOHNSON, EVERT A., Lecturer, M.A., University of Iowa, 1954

KINGTON, L. BRENT, Professor, M.F.A., Cranbrook Academy of Art, 1961

LINK, JOHN L., Assistant Professor, M.A., University of Oklahoma, 1968

LINTAULT, M. JOAN, Assistant Professor, M.F.A., Southern Illinois University, 1962

LITTLEFIELD, F. LEE, Assistant Professor, M.A., University of New Mexico, 1968

MAVIGLIANO, GEORGE J., Assistant Professor, M.A., Northern Illinois University, 1967

ONKEN, MICHAEL O., Instructor, M.A., Northern Illinois University, 1966

PAULSON, ROBERT L., Assistant Professor, M.F.A., University of Wisconsin, 1967

SULLIVAN, JAMES E., Associate Professor, M.A., University of California-Los Angeles, 1965

SULLIVAN, MILTON F., Professor and *Director*, M.A., Columbia University, 1951

VERGETTE, NICHOLAS, Professor, Art Teachers Diploma, London University, 1951

WALSH, ROBERT A., Instructor, M.A., University of Iowa, 1969

WALSH, THOMAS J., Associate Professor, M.F.A., University of Michigan, 1962

Botany (College of Science)

ASHBY, WILLIAM C., Professor, Ph.D., University of Chicago, 1950

MATTEN, LAWRENCE C., Associate Professor, Ph.D., Cornell University, 1965

MOHLENBROCK, ROBERT H., Professor and *Chairman*, Ph.D., Washington University, 1957

MYERS, OVAL, JR., Associate Professor, Ph.D., Cornell University, 1963

PAPPELIS, ARISTOTEL J., Professor, Ph.D., Iowa State University, 1957

ROBERTSON, PHILIP A., Assistant Professor, Ph.D., Colorado State University, 1968

SCHMID, WALTER E., Professor, Ph.D., University of Wisconsin, 1961

STOTLER, RAYMOND E., Assistant Professor, Ph.D., University of Cincinnati, 1968

SUNDBERG, WALTER J., Assistant Professor, Ph.D., University of California, 1971

TINDALL, DONALD R., Associate Professor, Ph.D., University of Louisville, 1966
UGENT, DONALD, Associate Professor, Ph.D., University of Wisconsin, 1966
VERDUIN, JACOB, Professor, Ph.D., Iowa State University, 1947
VOIGT, JOHN W., Professor, Ph.D., University of Nebraska, 1950
YOPP, JOHN H., Assistant Professor, Ph.D., University of Louisville, 1969

Business Education (College of Education)

BAUERNFEIND, HARRY B., Professor, *Emeritus*, M.A., Northwestern University, 1943
BUBOLTZ, VAN A., Assistant Professor, M.A., Northwestern University, 1937
JACOBSON, HARRY E., Assistant Professor, Ph.D., Southern Illinois University, 1969
RAHE, HARVES C., Professor and *Chairman*, Ed.D., Indiana University, 1950

Center for the Study of Crime, Delinquency, and Corrections (College of Human Resources)

ANDERSON, DENNIS, Assistant Professor, Ed.D., University of Nebraska, 1970
COUGHLIN, JOSEPH S., Professor, M.S.W., University of Wisconsin, 1954
DREHER, ROBERT H., Associate Professor, J.D., University of Illinois, 1968
EYNON, THOMAS G., Professor, Ph.D., Ohio State University, 1959
JOHNSON, ELMER H., Professor, Ph.D., University of Wisconsin, 1950
MATTHEWS, CHARLES V., Associate Professor and *Director*, M.A., University of Kansas City, 1951
RICH, VERNON, Associate Professor, Ph.D., Michigan State University, 1971
WILSON, KENNETH G., Assistant Professor, Ph.D., Kansas State University, 1973
WILSON, Nanci K., Assistant Professor, Ph.D., University of Tennessee, 1972

Chemistry and Biochemistry (College of Science)

ARNOLD, RICHARD T., Professor and *Chairman*, Ph.D., University of Illinois, 1937
BeMILLER, JAMES N., Professor, Ph.D., Purdue University, 1959
BEYLER, ROGER E., Professor, Ph.D., University of Illinois, 1949
BOLEN, D. WAYNE, Assistant Professor, Ph.D., Florida State University, 1969
CASKEY, ALBERT L., Associate Professor, Ph.D., Iowa State University, 1961
COX, JAMES A., Assistant Professor, Ph.D., University of Illinois, 1967
DORSEY, J. KEVIN, Assistant Professor, Ph.D., University of Wisconsin, 1968
EMPTAGE, MICHAEL R., Assistant Professor, Ph.D., Harvard University, 1965
GEIGER, WILLIAM E., JR., Assistant Professor, Ph.D., Cornell University, 1970
GIBBARD, H. FRANK, JR., Assistant Professor, Ph.D., Massachusetts Institute of Technology, 1967
GUYON, JOHN C., Professor, Ph.D., Purdue University, 1961
HADLER, HERBERT I., Associate Professor, Ph.D., University of Wisconsin, 1952
HADLEY, ELBERT H., Professor, Ph.D., Duke University, 1940
HALL, J. HERBERT, Professor, Ph.D., University of Michigan, 1959

HARGRAVE, PAUL A., Assistant Professor, Ph.D., University of Minnesota, 1970
 HINCKLEY, CONRAD C., Associate Professor, Ph.D., University of Texas, 1964
 KOSTER, DAVID F., Associate Professor, Ph.D., Texas A & M University, 1965
 MEYERS, CAL Y., Professor, Ph.D., University of Illinois, 1951
 SCHMULBACH, C. DAVID, Professor, Ph.D., University of Illinois, 1958
 SLOCUM, DONALD W., Professor, Ph.D., New York University, 1963
 SMITH, GERARD V., Professor, Ph.D., University of Arkansas, 1959
 SUNG, MICHAEL T., Assistant Professor, Ph.D., University of Wisconsin, 1968
 TRIMBLE, RUSSELL F., Professor, Ph.D., Massachusetts Institute of Technology, 1951
 TYRRELL, JAMES, Associate Professor, Ph.D., University of Glasgow, 1963

Child and Family (College of Human Resources)

BARLOW, BRENT A., Assistant Professor, Ph.D., Florida State University, 1971
 EDDLEMAN, E. JACQUELINE, Assistant Professor, Ph.D., Southern Illinois University, 1970
 FLYNN, TIMOTHY M., Assistant Professor, Ph.D., Florida State University, 1970
 HOSKIN, BARBARA B., Assistant Professor, Ph.D., Southern Illinois University, 1972
 PATTISON, JOYCE E., Assistant Professor, Ph.D., Arizona State University, 1971
 ZUNICH, MICHAEL, Professor and *Chairman*, Ph.D., Florida State University, 1959

Cinema and Photography (College of Communications and Fine Arts)

BLUMENBERG, RICHARD M., Associate Professor, Ph.D., Ohio University, 1969
 DAVIS, ROBERT E., Professor and *Chairman*, Ph.D., University of Iowa, 1965
 GILMORE, DAVID A., Assistant Professor, M.F.A., Ohio University, 1969
 HORRELL, C. WILLIAM, Professor, Ed.D., Indiana University, 1955
 MERCER, JOHN, Professor, Ph.D., University of Nebraska, 1952
 SWEDLUND, CHARLES A., Associate Professor, M.S., Illinois Institute of Technology, 1961

Clothing and Textiles (College of Human Resources)

BERRY, THELMA HUFF, Professor, Ed.D., Columbia University, 1963
 FRIEND, SHIRLEY E., Associate Professor and *Chairman*, Ed.D., University of Arkansas, 1969
 PADGETT, ROSE, Professor, Ph.D., Purdue University, 1955

Community Development (College of Human Resources)

BHATTACHARYYA, JNANABROTA, Associate Professor, Ph.D., University of Delhi, India, 1969

- DELANEY, H. RICHARD, Associate Professor, Ph.D., University of Missouri-Columbia, 1967
- KNITTEL, ROBERT E., Associate Professor, Ph.D., Southern Illinois University, 1967
- POSTON, RICHARD, Research Professor, B.A., University of Montana, 1940
- THOMAS, RICHARD M., Professor and *Chairman*, D.Ed., University of California-Los Angeles, 1964
- VOTH, DONALD E., Assistant Professor, Ph.D., Cornell University, 1969
- WAKELEY, RAYMOND E., Professor, *Emeritus*, Ph.D., Cornell University, 1928

Computer Science (College of Liberal Arts)

- BAHR, KNUT A., Assistant Professor, D.Eng., Technical University of Darmstadt, 1964
- DANHOF, KENNETH J., Assistant Professor, Ph.D., Purdue University, 1969
- MARK, ABRAHAM M., Professor and *Chairman*, Ph.D., Cornell University, 1947
- RICKMAN, JON T., Assistant Professor, Ph.D., Washington State University, 1972
- WRIGHT, WILLIAM E., Assistant Professor, D.Sc., Washington University, 1972

Design (College of Human Resources)

- BENDER, HENRY E., Associate Professor, Ph.D., New York University, 1969
- ELLNER, JACK R., Professor, Ph.D., New York University, 1969
- FETTER, WILLIAM A., Lecturer and *Chairman*, B.A., University of Illinois, 1952
- GROSOWSKY, HAROLD, Lecturer, Certificate, IIT, Institute of Design, Chicago, 1960
- JEROME, MICHAEL C., Lecturer, Bachelor of Architecture, University of Cape Town, South Africa, 1952
- PERK, HARRY, F.W., Lecturer, B.A., University of California at Los Angeles, 1951
- PRATT, ELSA K., Lecturer, Certificate, Pratt Institute, Brooklyn, New York, IIT, Institute of Design, Chicago, 1957
- PRATT, DAVIS J., Lecturer, Certificate, University of Chicago and IIT, Institute of Design, Chicago, 1957
- ROAN, HERBERT, Lecturer, Certificate, Cooper Union, 1938
- SCHOEN, ALAN HUGH, Professor, Ph.D., University of Illinois, 1968

Economics (College of Liberal Arts)

- ADAMS, DONALD R., JR., Associate Professor, Ph.D., University of Pennsylvania, 1967
- BLACKORBY, CHARLES, Associate Professor, Ph.D., The Johns Hopkins University, 1967
- BOHI, DOUGLAS R., Associate Professor, Ph.D., Washington State University, 1967
- BUNGER, BYRON, Assistant Professor, Ph.D., University of Colorado, 1969
- CORNWALL, JOHN L., Professor, Ph.D., Harvard University, 1958
- EDELMAN, MILTON T., Professor, Ph.D., University of Illinois, 1951
- ELLIS, ROBERT J., JR., Associate Professor, Ph.D., University of Virginia, 1966
- FORAN, TERRY G., Assistant Professor, Ph.D., Pennsylvania State University, 1970

FRYMAN, RICHARD F., Associate Professor, Ph.D., University of Illinois, 1967
HICKMAN, C. ADDISON, Professor, Vandever Chair of Economics, Ph.D., State University of Iowa, 1942
LAYER, ROBERT G., Professor and *Chairman*, Ph.D., Harvard University, 1952
MARTINSEK, THOMAS A., Professor, Ph.D., The Ohio State University, 1956
PULSIPHER, ALLAN G., Associate Professor, Ph.D., Tulane University, 1971
RUSSELL, MILTON R., Professor, Ph.D., University of Oklahoma, 1963
STALON, CHARLES G., Associate Professor, Ph.D., Purdue University, 1966
STOWE, PETER S., Assistant Professor, Ph.D., Purdue University, 1970
VOGEL, ROBERT C., Associate Professor, Ph.D., Stanford University, 1967
WIEGAND, G. C., Professor *Emeritus*, Ph.D., Northwestern University, 1950

Educational Administration and Foundations (College of Education)

ARMISTEAD, FRED J., Professor, Ph.D., University of California, 1960
BACH, JACOB O., Professor, Ph.D., University of Wisconsin, 1951
CRUCE, DONALD G., Assistant Professor, Ed.D., Utah State University, 1971
DENNIS, LAWRENCE J., Associate Professor, Ph.D., Southern Illinois University, 1968
EATON, WILLIAM E., Assistant Professor, Ph.D., Washington University, 1971
HALL, JAMES H., Associate Professor, *Emeritus*, Ed.D., George Washington University, 1950
KAISER, DALE E., Associate Professor, Ph.D., University of Illinois, 1963
LEAN, ARTHUR E., Professor, Ph.D., University of Michigan, 1948
McKENZIE, WILLIAM R., Professor, Ed.D., University of Denver, 1953
MOORE, MALVIN E., Professor, Ed.D., George Peabody College for Teachers, 1959
PARKER, JAMES C., Assistant Professor, Ed.D., University of Tennessee, 1971
SASSE, EDWARD B., Associate Professor and *Chairman*, Ph.D., University of Wisconsin, 1966
SEALEY, RONALD W., Associate Professor, Ph.D., Syracuse University, 1971
SHELTON, WILLIAM E., Associate Professor, Ph.D., University of Chicago, 1950
STUCK, DEAN, Professor, Ph.D., Iowa State University, 1968
VERDUIN, JOHN R., JR., Professor, Ph.D., Michigan State University, 1962

Electrical Sciences and Systems Engineering (School of Engineering and Technology)

DODD, CURTIS W., Associate Professor, Ph.D., Arizona State University, 1967
DUNNING, E. LEON, Professor, Ph.D., University of Houston, 1967
FEISTE, VERNOLD K., Associate Professor, Ph.D., University of Missouri at Columbia, 1966
GRISMORE, F. LEE, JR., Associate Professor, Ph.D., Georgia Institute of Technology, 1970
McCALLA, THOMAS JR., Associate Professor, Ph.D., Case Western Reserve University, 1969
RAWLINGS, CHARLES A., Lecturer, M.S., Southern Illinois University, 1965
SMITH, JAMES G., Professor and *Chairman*, Ph.D., University of Missouri-Rolla, 1967

Elementary Education (College of Education)

- BEATTIE, IAN D., Associate Professor, Ph.D., Southern Illinois University, 1969
BRADFIELD, LUTHER E., Professor, Ed.D., Indiana University, 1953
BROD, ERNEST E., Professor, D.Ed., Colorado State College of Education, 1953
HILL, MARGARET K., Professor, Ed.D., Boston University, 1948
HUNGERFORD, HAROLD R., Associate Professor, Ph.D., Southern Illinois University, 1970
LAMB, MORRIS L., Assistant Professor, D.Ed., University of Oklahoma, 1970
LEE, J. MURRAY, Professor, *Emeritus*, Ph.D., Columbia University, 1934
LINDBERG, DORMALEE H., Assistant Professor, Ed.D., University of Missouri, 1969
MALONE, WILLIS E., Professor, Ph.D., Ohio State University, 1950
MATTHIAS, MARGARET, Assistant Professor, Ph.D., Southern Illinois University, 1972
MATTHIAS, WILLIAM, JR., Associate Professor, Ed.D., University of Illinois, 1964
PAIGE, DONALD D., Associate Professor and *Chairman*, Ed.D., Indiana University, 1966
QUISENBERRY, NANCY L., Assistant Professor, Ed.D., Indiana University, 1971
RANDOLPH, VICTOR, Professor, *Emeritus*, Ph.D., George Peabody College for Teachers, 1942
SHEPHERD, TERRY R., Assistant Professor, Ph.D., University of Illinois, 1971
SLOAN, FRED A., Professor, Ed.D., George Peabody College for Teachers, 1959
SWICK, KEVIN, Associate Professor, Ph.D., University of Connecticut, 1970

Engineering Mechanics and Materials (School of Engineering and Technology)

- AL RUBAYI, NAJIM, Associate Professor, Ph.D., University of Wisconsin, 1966
DAVIS, PHILIP, Professor and *Chairman*, Ph.D., University of Michigan, 1963
EVERS, JAMES, Associate Professor, Ph.D., University of Alabama, 1969
NOWACKI, C. RAYMOND, Associate Professor, Ph.D., University of Illinois, 1965
ORTHWEIN, WILLIAM, Professor, Ph.D., University of Michigan, 1959
SAMI, SEDAT, Professor, Ph.D., University of Iowa, 1966

School of Engineering and Technology (General)

- AMOROS, JOSE L., Professor, Ph.D., University of Madrid, 1945

English (College of Liberal Arts)

- APPLEBY, BRUCE C., Associate Professor, Ph.D., University of Iowa, 1967
BENZIGER, JAMES G., Professor, Ph.D., Princeton University, 1941
BOYLE, TED EUGENE, Professor, Ph.D., University of Nebraska, 1962
BROWN, WILLIAM J., Associate Professor, Ph.D., Duke University, 1966

CASSIDY, THOMAS E., Associate Professor, A.M., University of Notre Dame, 1938
 COHN, ALAN MARTIN, Professor, M.S., University of Illinois, 1955
 DONOW, HERBERT, Associate Professor, Ph.D., University of Iowa, 1966
 EPSTEIN, EDMUND L., Professor, Ph.D., Columbia University, 1967
 FRIEND, JEWELL, Assistant Professor, Ph.D., Southern Illinois University, 1970
 GARDNER, JOHN C., Professor, Ph.D., University of Iowa, 1958
 GOODIN, GEORGE, Associate Professor, Ph.D., University of Illinois, 1962
 GRIFFIN, ROBERT P., Associate Professor, Ph.D., University of Connecticut, 1965
 HARPER, CLIFFORD D., Associate Professor, Ph.D., St. Louis University, 1972
 HATTON, THOMAS J., Associate Professor, Ph.D., University of Nebraska, 1966
 HILLEGAS, MARK, Professor, Ph.D., Columbia University, 1957
 HOWELL, JOHN M., Associate Professor, Ph.D., Tulane University, 1963
 HURLEY, PAUL, Professor, Ph.D., Duke University, 1962
 LAWSON, RICHARD A., Associate Professor, Ph.D., Tulane University, 1966
 LEONARD, JOHN J., Associate Professor, M.A., University of Iowa, 1941
 MOORE, HARRY T., Professor and Research Professor, Ph.D., Boston University, 1951
 MORRILL, PAUL H., Professor, Ph.D., Northwestern University, 1956
 MOSS, SIDNEY P., Professor, Ph.D., University of Illinois, 1954
 PARTLOW, ROBERT B., JR., Professor, Ph.D., Harvard University, 1955
 PETERSON, RICHARD F., Assistant Professor, Ph.D., Kent State University, 1969
 PIPER, HENRY DAN, Professor, Ph.D., University of Pennsylvania, 1950
 RAINBOW, RAYMOND, Associate Professor, Ph.D., University of Chicago, 1959
 RAIZIS, M. BYRON, Associate Professor, Ph.D., New York University, 1966
 RUDNICK, HANS, Associate Professor, Ph.D., University of Freiburg, Germany, 1967
 SCHONHORN, MANUEL, Professor, Ph.D., University of Pennsylvania, 1963
 SCHULTZ, HOWARD, Professor, Ph.D., Harvard University, 1940
 SIMEONE, WILLIAM E., Professor, Ph.D., University of Pennsylvania, 1950
 STIBITZ, E. EARLE, Professor, Ph.D., University of Michigan, 1951
 TAYLOR, LARRY E., Associate Professor, Ph.D., University of Oklahoma, 1969
 TENNEY, CHARLES D., University Professor, *Emeritus*, Ph.D., University of Oregon, 1931
 VIETH, DAVID MUENCH, Professor, Ph.D., Yale University, 1953
 WEBB, HOWARD W., JR., Professor, Ph.D., University of Iowa, 1953

Family Economics and Management (College of Human Resources)

BROOKS, THOMAS M., Professor, Ph.D., Pennsylvania State University, 1961
 CRAIG, KAREN E., Associate Professor and *Chairperson*, Ph.D., Purdue University, 1969

Finance (College of Business and Administration)

ELSAID, HUSSEIN H., Associate Professor, Ph.D., University of Illinois, 1968
 SPRECHER, C. RONALD, Associate Professor, Ph.D., University of Illinois, 1969
 TYLER, R. STANLEY, Associate Professor, J.D., University of Illinois, 1952

VAUGHN, DONALD E., Professor and *Chairman*, Ph.D., University of Texas, 1961
WATERS, GOLA E., Associate Professor, Ph.D., Southern Illinois University, 1970

Food and Nutrition (College of Human Resources)

HARPER, JENNIE M., Professor, Ph.D., Cornell University, 1941
KONISHI, FRANK, Professor and *Chairman*, Ph.D., Cornell University, 1958
PAYNE, IRENE R., Professor, Ph.D., Cornell University, 1960

Foreign Languages and Literatures (College of Liberal Arts)

ANDERSON, KEITH, Assistant Professor, Ph.D., University of Colorado, 1970
BORK, ALBERT W., Professor, *Emeritus*, Doctor en Letras, National University of Mexico, 1944
BROWN, SANDRA L., Assistant Professor, Ph.D., University of North Carolina, 1969
CANFIELD, D. LINCOLN, Visiting Professor, Ph.D., Columbia University, 1934
FRENCH, HOWARD, Associate Professor, Ph.D., Indiana University, 1952
GOBERT, DAVID L., Professor, Ph.D., University of Iowa, 1960
HARTMAN, STEVEN LEE, Assistant Professor, Ph.D., University of Wisconsin, 1971
HARTWIG, HELLMUT A., Professor, Ph.D., University of Illinois, 1943
KILKER, JAMES, Associate Professor, Ph.D., University of Missouri at Columbia, 1961
KUPCEK, JOSEPH, Professor, Ph.D., Comenius University Bratislava, Czechoslovakia, 1943
LIEDLOFF, HELMUT, Associate Professor, Ph.D., Philipps University, Germany, 1956
McBRIDE, CHARLES, Associate Professor, Ph.D., University of Texas, 1968
MEINHARDT, WARREN, Associate Professor, Ph.D., University of California at Berkeley, 1960
O'BRIEN, JOAN, Assistant Professor, Ph.D., Fordham University, 1961
O'MEARA, MAURICE, Assistant Professor, Ph.D., University of Iowa, 1967
ORECHWA, OLGA, Assistant Professor, Ph.D., Ukrainian Free University, Germany, 1970
SOUTHWORTH, MARIE-JOSE, Assistant Professor, Ph.D., University of Pennsylvania, 1970
SPECK, CHARLES, Assistant Professor, Laurea in Diritto Canonico, Pontifical Lateran University, Italy, 1963
TAI, JAMES, Assistant Professor, Ph.D., Indiana University, 1970
TIMPE, EUGENE F., Professor and *Chairman*, Ph.D., University of Southern California, 1960
ULNER, ARNOLD, Assistant Professor, Ph.D., University of Missouri at Columbia, 1972
VOGELY, MAXINE, Assistant Professor, Ph.D., University of Illinois, 1969
WOODBIDGE, HENSLEY, Professor, Ph.D., University of Illinois, 1950

Forestry (School of Agriculture)

- ANDRESEN, JOHN W., Professor, Ph.D., Rutgers University, 1959
 BEY, CALVIN F., Adjunct Assistant Professor, Ph.D., Iowa State University, 1970
 BUDELSKY, CARL A., Assistant Professor, Ph.D., University of Arizona, 1969
 CHAPMAN, ARTHUR G., Adjunct Professor, Ph.D., Ohio State University, 1933
 CHEN, PETER Y., Adjunct Assistant Professor, Ph.D., University of Minnesota, 1968
 CHILMAN, KENNETH C., Associate Professor, Ph.D., University of Michigan, 1972
 FRALISH, JAMES S., Assistant Professor, Ph.D., University of Wisconsin, 1970
 FUNK, DAVID T., Adjunct Assistant Professor, Ph.D., Michigan State University, 1971
 GAFFNEY, GERALD R., Assistant Professor, Ph.D., Southern Illinois University, 1970
 KUNG, FAN H., Assistant Professor, Ph.D., Michigan State University, 1968
 LINDMARK, RONALD D., Adjunct Assistant Professor, Ph.D., Ohio State University, 1971
 LOSCHE, CRAIG K., Adjunct Associate Professor, Ph.D., North Carolina State University, 1967
 McCURDY, DWIGHT R., Professor, Ph.D., Ohio State University, 1964
 MOSLEMI, ALI A., Professor and *Chairman*, Ph.D., Michigan State University, 1964
 MYERS, CHARLES C., Associate Professor, Ph.D., Purdue University, 1966
 NOWAK, PAUL F., Associate Professor, Ph.D., University of Michigan, 1969
 PHARES, ROBERT E., Adjunct Associate Professor, Ph.D., Iowa State University, 1964
 ROSEN, HOWARD N., Adjunct Assistant Professor, Ph.D., Northwestern University, 1969
 ROTH, PAUL L., Associate Professor, Ph.D., Kansas State University, 1968
 WEAVER, GEORGE T., Assistant Professor, Ph.D., University of Tennessee, 1972
 YAMBERT, PAUL A., Professor, Ph.D., University of Michigan, 1960

Geography (College of Liberal Arts)

- AREY, DAVID G., Associate Professor, Ph.D., Clark University, 1969
 BAUMANN, DUANE D., Associate Professor, Ph.D., Clark University, 1968
 BEAZLEY, RONALD I., Professor, Ph.D., Purdue University, 1954
 CARTER, DOUGLAS B., Professor and *Chairman*, Ph.D., University of Washington, 1957
 CHRISTENSEN, DAVID E., Professor, Ph.D., University of Chicago, 1956
 IRWIN, DANIEL R., Associate Professor, Ph.D., Syracuse University, 1972
 JONES, DAVID L., Professor, Ph.D., Pennsylvania State University, 1960
 PENNINGTON, CAMPBELL, Professor, Ph.D., University of California at Berkeley, 1959
 SHARPE, DAVID M., Associate Professor, Ph.D., Southern Illinois University, 1968

Geology (College of Science)

- COHEN, ARTHUR D., Assistant Professor, Ph.D., The Pennsylvania State University, 1968
- DAVIS, RICHARD W., Assistant Professor, Ph.D., University of Arizona, 1967
- DUTCHER, RUSSELL R., Professor and *Chairman*, Ph.D., The Pennsylvania State University, 1960
- ETHRIDGE, FRANK G., Assistant Professor, Ph.D., Texas A & M University, 1970
- FANG, JEN-HO, Professor, Ph.D., The Pennsylvania State University, 1961
- FRANK, CHARLES OTIS, Assistant Professor, Ph.D., Syracuse University, 1973
- FRAUNFELTER, GEORGE H., Professor, Ph.D., University of Missouri, 1964
- HARRIS, STANLEY E., JR., Professor, Ph.D., State University of Iowa, 1947
- HOOD, WILLIAM C., Associate Professor, Ph.D., University of Montana, 1964
- RITTER, DALE F., Professor, Ph.D., Princeton University, 1964
- ROBINSON, PAUL D., Assistant Professor, M.S., Southern Illinois University, 1963
- UTGAARD, JOHN E., Professor, Ph.D., Indiana University, 1963
- ZIMMERMAN, JAY, JR., Associate Professor, Ph.D., Princeton University, 1968

Guidance and Educational Psychology (College of Education)

- ALTEKRUSE, MICHAEL D., Associate Professor, Ed.D., Indiana University, 1967
- AMBLE, BRUCE ROY, Professor, Ph.D., University of Iowa, 1963
- BARDO, HAROLD R., Assistant Professor, Ph.D., Southern Illinois University, 1972
- BEGGS, DONALD LEE, Professor, Ph.D., University of Iowa, 1966
- BRADLEY, RICHARD W., Associate Professor, Ph.D., University of Wisconsin, 1968
- CODY, JOHN J., Professor, Ph.D., University of Wisconsin, 1961
- DEICHMANN, JOHN W., Assistant Professor, Ph.D., St. Louis University, 1969
- DeWEESE, HAROLD L., Professor, D.Ed., University of Illinois, 1959
- ELMORE, PATRICIA B., Assistant Professor, Ph.D., Southern Illinois University, 1970
- EVANS, JOHN REAVES, Associate Professor, Ph.D., Southern Illinois University, 1968
- GRAFF, ROBERT W., Associate Professor, Ed.D., State University of New York at Buffalo, 1968
- GRENFELL, JOHN E., Professor, Ed.D., Oregon State University, 1966
- HALADYNA, THOMAS, Assistant Professor, Ph.D., Arizona State University, 1973
- KELLY, FRANCIS J., Professor, Ph.D., University of Texas, 1963
- LEWIS, ERNEST, Assistant Professor, Ph.D., Southern Illinois University, 1971
- LINDSEY, JEFFERSON F., Professor, Ed.D., University of Texas, 1962
- MEEK, CLINTON ROSCOE, Professor, Ph.D., George Peabody College for Teachers, 1954
- MILES, DAVID T., Associate Professor, Ph.D., Southern Illinois University, 1967
- MILLER, WILLIAM G., Associate Professor, Ph.D., University of Iowa, 1967
- MOUW, JOHN T., Associate Professor and *Chairman*, Ed.D., University of South Dakota, 1968

POHLMANN, JOHN T., Assistant Professor, Ph.D., Southern Illinois University, 1972
RECTOR, ALICE P., Associate Professor, Washington University, 1953
RENZAGLIA, GUY A., Professor, Ph.D., University of Minnesota, 1952
TYLER, THOMAS A., Associate Professor, Ph.D., University of Chicago, 1968
VIECELI, LOUIS, Assistant Professor, M.S.Ed., Southern Illinois University, 1959
WHITE, GORDON, Assistant Professor, Ph.D., University of Iowa, 1969
WILLIAMS, REED G., Assistant Professor, Ph.D., Indiana University, 1970
WOEHLKE, PAULA L., Assistant Professor, Ph.D., Arizona State University, 1973
YATES, J. W., Professor, Ed.D., University of Missouri at Columbia, 1951

Health Education (College of Education)

AARON, JAMES E., Professor, Ed.D., New York University, 1960
AMADIO, JOHN B., Assistant Professor, Ph.D., University of Oklahoma, 1970
BOYDSTON, DONALD N., Professor and *Chairman*, Ed.D., Columbia University, 1949
CASEY, RALPH, Associate Professor, Ed.D., Columbia University, 1956
GRISSOM, DEWARD K., Professor, Ed.D., Columbia University, 1952
HARRIS, EILEEN M., Assistant Professor, Ph.D., Southern Illinois University, 1970
LeFEVRE, JOHN R., Professor, Ed.D., Teachers College, Columbia University, 1950
LINDAUER, LARRY, Assistant Professor, Ph.D., Southern Illinois University, 1972
PHILLIPS, FRANCES K., Associate Professor, M.A., Columbia University, 1940
RICHARDSON, CHARLES E., Professor, Ed.D., University of California at Los Angeles, 1959
RITZEL, DALE, Assistant Professor, Ph.D., Southern Illinois University, 1970
RUSSELL, ROBERT D., Professor, Ed.D., Stanford University, 1954
SLIEPCEVICH, ELENA M., Professor, D.P.E., Springfield College, 1955
VAUGHAN, ANDREW T., Professor, D.Ed., Columbia University, 1958

Higher Education (College of Education)

ADAMS, FRANK C., Professor, Ph.D., Southern Illinois University, 1962
CALDWELL, OLIVER J., Professor, *Emeritus*, M.S., Oberlin College, 1927
CASEBEER, ARTHUR L., Associate Professor, Ed.D., Oregon State University, 1963
CLARK, ELMER J., Professor, Ph.D., University of Michigan, 1949
DAVIS, I. CLARK, Professor, Ed.D., Indiana University, 1956
GRAHAM, JACK W., Professor, Ph.D., Purdue University, 1951
HAWLEY, JOHN B., Professor, Ph.D., University of Michigan, 1957
JUNG, LOREN B., Associate Professor, Ph.D., Southern Illinois University, 1969
KEENE, ROLAND, Associate Professor, Ed.D., Washington University, 1962
KING, JOHN E., Professor and *Chairman*, Ph.D., Cornell University, 1941
PRATT, ARDEN L., Professor, Ph.D., State University of New York at Buffalo, 1968
SWINBURNE, BRUCE R., Associate Professor, Ed.D., Indiana University, 1970

TOLLE, DONALD J., Professor, Ed.D., Florida State University, 1957
 ZIMMERMAN, ELWYN, Assistant Professor, Ph.D., Michigan State University, 1963

History (College of Liberal Arts)

ADAMS, GEORGE W., Professor, *Emeritus*, Ph.D., Harvard University, 1946
 ALLEN, HOWARD W., Professor, Ph.D., University of Washington, 1959
 AMMON, HARRY, Professor, Ph.D., University of Virginia, 1948
 BARTON, H. ARNOLD, Associate Professor, Ph.D., Princeton University, 1962
 BATINSKI, MICHAEL C., Assistant Professor, Ph.D., Northwestern University, 1969
 BREHM, DONALD L., Assistant Professor, Ph.D., St. Louis University, 1968
 CARROTT, M. BROWNING, Associate Professor and *Chairman*, Ph.D., Northwestern University, 1966
 CLIFFORD, JOHN R., Associate Professor, Ph.D., University of Iowa, 1954
 CONRAD, DAVID E., Associate Professor, Ph.D., University of Oklahoma, 1962
 DETWILER, DONALD S., Associate Professor, Dr.Phil., Göttingen University, Germany, 1961
 FLADELAND, BETTY L., Professor, Ph.D., University of Michigan, 1952
 GARDINER, C. HARVEY, Research Professor, Ph.D., University of Michigan, 1945
 GOLD, ROBERT L., Associate Professor, Ph.D., University of Iowa, 1964
 JAMES, FELIX, Assistant Professor, Ph.D., Ohio State University, 1972
 McFARLIN, HAROLD A., Assistant Professor, Ph.D., Indiana University, 1971
 MURPHY, JAMES B., Associate Professor, Ph.D., Louisiana State University, 1968
 O'DAY, EDWARD J., Instructor, A.M., Indiana University, 1956
 SHELBY, LON R., Professor, Ph.D., University of North Carolina, 1962
 SIMON, JOHN Y., Professor, Ph.D., Harvard University, 1961
 TRANI, EUGENE P., Associate Professor, Ph.D., Indiana University, 1966
 VYVERBERG, HENRY S., Associate Professor, Ph.D., Harvard University, 1950
 WERLICH, DAVID P., Assistant Professor, Ph.D., University of Minnesota, 1968
 ZUCKER, STANLEY, Assistant Professor, Ph.D., University of Wisconsin, 1968

Home Economics Education (College of Education)

CARTER, ROSE MARY, Assistant Professor, Ph.D., Purdue University, 1970
 FULTS, ANNA CAROL, Professor and *Chairman*, Ph.D., Ohio State University, 1946
 KEENAN, DOROTHY, Professor, Ed.D., University of Illinois, 1962

Instructional Materials (College of Education)

BAUNER, RUTH E., Associate Professor, M.S., University of Illinois, 1956
 BUTTS, GORDON K., Professor and *Chairman*, Ed.D., Indiana University, 1956
 DALE, DORIS C., Associate Professor, D.L.S., Columbia University, 1968
 FLETCHER, KATHLEEN G., Associate Professor, M.S., University of Illinois, 1947

INGLI, DONALD A., Associate Professor, Ph.D., University of Wisconsin, 1961
JURGEMEYER, FREDERICK H., Assistant Professor, D.Ed., University of Oklahoma, 1970
KLASEK, CHARLES B., Assistant Professor, Ph.D., University of Nebraska, 1971
PLANINC, CARL M., Assistant Professor, Ed.D., Indiana University, 1967
SPIGLE, IRVING S., Associate Professor, Ed.D., Indiana University, 1955
WINSOR, DONALD, Associate Professor, Ed.D., University of Florida, 1961

Interior Design (College of Human Resources)

LOUGEAY, PAUL J., Associate Professor and *Chairman*, Registered Architect, M.S., Southern Illinois University, 1973
STEWART, LUCY P., Assistant Professor, M.S., Southern Illinois University, 1964

Journalism (College of Communications and Fine Arts)

ATWOOD, L. ERWIN, Associate Professor, Ph.D., University of Iowa, 1965
BROWN, GEORGE C., Professor, Ph.D., Southern Illinois University, 1963
CHU, GODWIN C., Professor, Ph.D., Stanford University, 1964
GROTTA, GERALD L., Associate Professor, Ph.D., Southern Illinois University, 1970
GRUNY, C. RICHARD, Assistant Professor, J.D., University of Illinois, 1968
HART, JIM ALLEE, Professor, Ph.D., University of Missouri, 1959
LONG, HOWARD R., Professor, Ph.D., University of Missouri, 1948
LOWRY, DENNIS T., Assistant Professor, Ph.D., University of Iowa, 1972
McCOY, RALPH E., Ph.D., University of Illinois, 1956
RICE, W. MANION, Associate Professor, Ph.D., Southern Illinois University, 1967
RUCKER, BRYCE W., Professor, Ph.D., University of Missouri, 1959
STONECIPHER, HARRY W., Assistant Professor, Ph.D., Southern Illinois University, 1971
TRAGER, ROBERT E., Assistant Professor, Ph.D., University of Minnesota, 1972
WOOD, THOMAS W., Associate Professor, Ph.D., University of Oklahoma, 1966

Linguistics (College of Liberal Arts)

CARRELL, PATRICIA L., Associate Professor and *Chairman*, Ph.D., University of Texas, 1966
GILBERT, GLENN G., Associate Professor, Ph.D., Harvard University, 1963
KONNEKER, BEVERLY HILL, Assistant Professor, Ph.D., University of Texas, 1972
NGUYEN, DINH-HOA, Professor, Ph.D., New York University, 1956
PARISH, CHARLES, Professor, Ph.D., University of New Mexico, 1959
PARTMANN, GAYLE H., Assistant Professor, Ph.D., Stanford University, 1973
REDDEN, JAMES E., Professor, Ph.D., Indiana University, 1965
SILVERSTEIN, RAYMOND O., Assistant Professor, Ph.D., University of California at Los Angeles, 1973

Marketing (College of Business and Administration)

ADAMS, KENDALL A., Professor, Ph.D., Michigan State University, 1962
ANDERSEN, R. CLIFTON, Professor, D.B.A., Indiana University, 1960
DOMMERMUTH, WILLIAM P., Professor and *Chairman*, Ph.D., Northwestern University, 1964
HINDERSMAN, CHARLES H., Professor, D.B.A., Indiana University, 1959
JAMES, DONALD L., Associate Professor, D.B.A., University of Colorado, 1970
MOORE, JAMES R., Assistant Professor, Ph.D., University of Illinois, 1972
PERRY, DONALD L., Associate Professor, Ph.D., University of Illinois, 1966
POWELL, ANDREW F., Associate Professor, Ph.D., Michigan State University, 1968

Mathematics (College of Liberal Arts)

ARTEMIADIS, NICOLAS, Professor, D.Sc., University of Paris (Sorbonne), 1957
BAARTMANS, ALPHONSE H., Assistant Professor, Ph.D., Michigan State University, 1967
BIESTERFELDT, HERMAN, Associate Professor, Ph.D., Pennsylvania State University, 1963
BOUWSMA, WARD, Associate Professor, Ph.D., University of Michigan, 1962
BURTON, THEODORE A., Professor, Ph.D., Washington State University, 1964
CRENSHAW, JAMES A., Assistant Professor, Ph.D., University of Illinois, 1967
DANHOF, KENNETH, Assistant Professor, Ph.D., Purdue University, 1969
FOLAND, NEAL E., Professor and *Chairman*, Ph.D., University of Missouri, 1961
GATES, LESLIE D., Associate Professor, Ph.D., Iowa State University, 1952
GREGORY, JOHN, Assistant Professor, Ph.D., University of California at Los Angeles, 1969
GRIMMER, RONALD C., Associate Professor, Ph.D., University of Iowa, 1967
HOOKER, JOHN W., Assistant Professor, Ph.D., University of Oklahoma, 1967
HUNSAKER, WORTHEN N., Assistant Professor, Ph.D., Washington State University, 1966
KAMMLER, DAVID, Assistant Professor, Ph.D., University of Michigan, 1971
KIRK, RONALD B., Associate Professor, Ph.D., California Institute of Technology, 1968
KOCH, CHARLES, Assistant Professor, Ph.D., University of Illinois, 1961
KUIPERS, LAUWERENS, Professor, Ph.D., Vrije Universiteit (Amsterdam), 1947
LANGENHOP, CARL E., Professor, Ph.D., Iowa State University, 1948
MAXWELL, CHARLES, Professor, Ph.D., University of Illinois, 1955
MILLMAN, RICHARD, Assistant Professor, Ph.D., Cornell University, 1971
MOORE, ROBERT A., Associate Professor, Ph.D., Indiana University, 1962
NATHANSON, MELVYN B., Assistant Professor, Ph.D., University of Rochester, 1971
NIEDERREITER, HARALD, Associate Professor, Ph.D., University of Vienna, 1969
OLMSTED, JOHN M. H., Professor, Ph.D., Princeton University, 1940
PAINE, THOMAS B., Assistant Professor, Ph.D., University of Oregon, 1966
PANCHAPAKESAN, S., Assistant Professor, Ph.D., Purdue University, 1969
PARKER, GEORGE D., Assistant Professor, Ph.D., University of California, at San Diego, 1971

- PATULA, WILLIAM T., Assistant Professor, Ph.D., Carnegie-Mellon University, 1972
- PEDERSEN, FRANKLIN D., Assistant Professor, Ph.D., Tulane University, 1967
- PEDERSEN, KATHERINE, Assistant Professor, Ph.D., Tulane University, 1969
- SELDIN, JONATHAN P., Assistant Professor, Ph.D., University of Amsterdam, 1968
- SHOCK, ROBERT C., Associate Professor, Ph.D., University of North Carolina, 1969
- SKALSKY, MICHAEL, Professor, D.Nat.Sc., University of Göttingen, 1949
- SNYDER, HERBERT H., Professor, Ph.D., Lehigh University, 1965, Ph.D., University of South Africa, 1972
- STARKS, THOMAS H., Associate Professor, Ph.D., Virginia Polytechnic Institute, 1959
- TOWNSEND, CARL, Associate Professor, Ph.D., Washington State University, 1965
- WILSON, JOSEPH C., Professor, Ph.D., Louisiana State University, 1954

Microbiology (College of Science)

- CASTER, JOHN, Assistant Professor, Ph.D., St. Louis University, 1968
- GILMORE, R. A., Assistant Professor, Ph.D., University of California at Berkeley, 1966
- JACKSON, ROBERT, Associate Professor, Ph.D., Purdue University, 1963
- LINDEGREN, CARL C., Professor, *Emeritus*, Ph.D., California Institute of Technology, 1931
- McCLARY, DAN O., Professor, Ph.D., Washington University, 1951
- OGUR, MAURICE, Professor and *Chairman*, Ph.D., Columbia University, 1948
- ROUHANDEH, HASSAN, Professor, Ph.D., Kansas State University, 1959
- SHECHMEISTER, ISAAC L., Professor, Ph.D., University of California at Berkeley, 1949

Music (College of Communications and Fine Arts)

- BARWICK, STEVEN, Professor, Ph.D., Harvard University, 1949
- BATEMAN, MARIANNE WEBB, M.Mus., University of Michigan, 1959
- BOE, JOHN, Associate Professor, Northwestern University, 1969
- BOTTJE, WILL GAY, Professor, A.Mus.D., Eastman School of Music, 1955
- EDDINS, JOHN, Assistant Professor, Ph.D., Florida State University, 1966
- FLOYD, SAMUEL, Associate Professor, Ph.D., Southern Illinois University, 1969
- GORDON, RODERICK, Professor, Ph.D., University of Wisconsin, 1953
- GRIZZELL, MARY JANE, Assistant Professor, M.Mus., Eastman School of Music, 1943
- HOUSE, ROBERT, Professor and *Director*, Ed.D., University of Illinois, 1954
- HUSSEY, GEORGE, Associate Professor, M.A.Ed., Washington University, 1963
- KAGEFF, BURT, Assistant Professor, A.M., University of Missouri, 1962
- KINGSBURY, ROBERT, Associate Professor, M.Mus., Northwestern University, 1956

- KOENIGSTEIN, NICHOLAS, Assistant Professor, M.Mus., West Virginia University, 1956
- LEMASTERS, DONALD, Instructor, M.Mus., Northwestern University, 1949
- McHUGH, CATHERINE, Professor, Ed.D., Columbia University, 1959
- MUELLER, ROBERT, Professor, Ph.D., Indiana University, 1954
- NADAF, GEORGE, Assistant Professor, M.Mus., Manhattan School of Music, 1956
- OLDFIELD, W. ALAN, Associate Professor, Ph.D., North Texas State University, 1969
- OLSSON, PHILLIP, Professor, M.Mus., Chicago Conservatory, 1949
- POULOS, HELEN, Assistant Professor, D.M.A., Indiana University, 1971
- RESNICK, ROBERT, Professor, M.Mus., Wichita University, 1949
- SIENER, MELVIN, Associate Professor, M.A., University of Iowa, 1954
- STIMAN, HAROLD EUGENE, Assistant Professor, M.S., University of Illinois, 1957
- TAYLOR, CHARLES, Associate Professor, Ed.D., Columbia University, 1950
- UNDERWOOD, JERVIS, Associate Professor, Ph.D., North Texas State University, 1970
- WALLACE, MARY ELAINE, Associate Professor, M.Mus., University of Illinois, 1954
- WERNER, KENT, Associate Professor, Ph.D., University of Iowa, 1966

Occupational Education (College of Education)

- BAILEY, LARRY J., Associate Professor, Ed.D., University of Illinois, 1968
- BITTLE, R. E., Professor, Ed.D., University of Florida, 1956
- BORTZ, RICHARD F., Associate Professor, Ph.D., University of Minnesota, 1967
- BUILA, THEODORE, Assistant Professor, Ph.D., Cornell University, 1968
- ERICKSON, JOHN H., Professor, Ed.D., Pennsylvania State University, 1953
- HUCK, JOHN F., Assistant Professor, Ed.D., University of Illinois, 1973
- JENKINS, JAMES, Associate Professor, Ed.D., Pennsylvania State University, 1955
- NYSTROM, DENNIS C., Associate Professor, Ed.D., Texas A&M University, 1969
- RAMP, WAYNE S., Professor, Ed.D., Bradley University, 1956
- ROSENBARGER, MAXINE, Associate Professor, Ph.D., Southern Illinois University, 1970
- STADT, RONALD W., Professor and *Chairman*, Ed.D., University of Illinois, 1962
- SULLIVAN, JAMES A., Associate Professor, Ed.D., West Virginia University, 1967
- WEISMAN, LAWRENCE, Assistant Professor, Ph.D., Florida State University, 1972

Philosophy (College of Liberal Arts)

- AUDI, MICHAEL N., Assistant Professor, Ph.D., Johns Hopkins University, 1970
- CLARKE, DAVID S., JR., Associate Professor and *Chairman*, Ph.D., Emory University, 1964
- DIEFENBECK, JAMES A., Professor, Ph.D., Harvard University, 1950
- EAMES, ELIZABETH R., Professor, Ph.D., Bryn Mawr College, 1951
- EAMES, S. MORRIS, Professor, Ph.D., University of Chicago, 1958
- FRONDIZI, RISIERI, Professor, Ph.D., National University of Mexico, 1950

GILLAN, GARTH J., Associate Professor, Ph.D., Duquesne University, 1966
HAHN, LEWIS E., Research Professor, Ph.D., University of California, 1939
HAYWARD, JOHN, Professor, Ph.D., University of Chicago, 1949
HOWIE, JOHN, Associate Professor, Ph.D., Boston University, 1965
KELLY, MATTHEW J., Associate Professor, Ph.D., University of Notre Dame, 1963
LIU, SHU-HSIEN, Associate Professor, Ph.D., Southern Illinois University, 1966
McCLURE, GEORGE T., Professor, Ph.D., Ohio State University, 1958
MIJUSKOVIC, BEN L., Assistant Professor, Ph.D., University of California, 1972
MOORE, WILLIS, Professor, *Emeritus*, Ph.D., University of California, 1936
PLOCHMANN, GEORGE KIMBALL, Professor, Ph.D., University of Chicago, 1950
SCHEDLER, GEORGE, Assistant Professor, Ph.D., University of California at San Diego, 1973
SCHILPP, PAUL A., Visiting Professor, Ph.D., Stanford University, 1936
SINGH, BHAGWAN B., Assistant Professor, Ph.D., State University of New York at Buffalo, 1970
TENNEY, CHARLES, University Professor, *Emeritus*, Ph.D., University of Oregon, 1931

Physical Education for Men (College of Education)

ACKERMAN, KENNETH, Assistant Professor, M.A., Michigan State, 1959
CARROLL, PETER, Assistant Professor, Ph.D., Pennsylvania State University, 1970
FRANKLIN, C. C., Assistant Professor, M.S. in Ed., Indiana University, 1946
GOOD, LARRY, Associate Professor, Ed.D., Temple University, 1968
KNOWLTON, RONALD, Professor, Ph.D., University of Illinois, 1961
SHEA, EDWARD, Professor and *Chairman*, Ph.D., New York University, 1955
SPACKMAN, ROBERT, Associate Professor, M.S. in Ed., Southern Illinois University, 1960
STOTLAR, JOHN, Associate Professor, P.E.D., Indiana University, 1948
WILKINSON, JAMES, Associate Professor, P.E.D., Indiana University, 1958

Physical Education for Women (College of Education)

DAVIES, DOROTHY R., Professor, *Emerita*, Ed.D., University of Cincinnati, 1944
GORDON, LONNY J., Assistant Professor, M.F.A., University of Wisconsin, 1967
POTTER, MARJORIE BOND, Associate Professor, Ph.D., University of Southern California, 1958
STEHR, JEAN, Associate Professor, M.A., Texas Woman's University, 1945
THORPE, JoANNE LEE, Professor and *Chairman*, Ph.D., Texas Woman's University, 1964
WEST, CHARLOTTE, Professor, Ph.D., University of Wisconsin, 1969
ZIMMERMAN, HELEN, Professor, Ph.D., University of Wisconsin, 1951

Physics and Astronomy (College of Science)

- BORST, WALTER L., Assistant Professor, Ph.D., University of California at Berkeley, 1968
 BOSE, SUBIR K., Associate Professor, Ph.D., University of Allahabad, India, 1967
 CHANG-FANG, CHUEN-CHUEN, Assistant Professor, Ph.D., Duke University, 1961
 GRUBER, BRUNO J., Professor, Ph.D., University of Vienna, Austria, 1962
 HENNEBERGER, WALTER C., Professor, Ph.D., Göttingen University, Germany, 1959
 JOHNSON, KENNETH W., Assistant Professor, Ph.D., Ohio State University, 1967
 MARSHALL, LAURISTON C., Adjunct Professor, Ph.D., University of California at Berkeley, 1929
 NICKELL, WILLIAM E., Professor, Ph.D., University of Iowa, 1954
 SANDERS, FRANK C., JR., Assistant Professor, Ph.D., University of Texas, 1968
 SAPOROSCHENKO, MYKOLA, Associate Professor, Ph.D., Washington University, 1958
 WATSON, RICHARD E., Professor, Ph.D., University of Illinois, 1938
 ZIMMERMAN, JOHN R., Professor, Ph.D., Ohio State University, 1949
 ZITTER, ROBERT N., Professor, Ph.D., University of Chicago, 1962

Physiology (College of Science)

- BROWNING, RONALD A., Assistant Professor, Ph.D., University of Illinois, 1971
 DUNAGAN, TOMMY T., Professor, Ph.D., Purdue University, 1960
 FALVO, RICHARD E., Assistant Professor, Ph.D., University of Wyoming, 1970
 FOOTE, FLORENCE M., Professor, Ph.D., University of Iowa, 1940
 GASS, GEORGE H., Professor, Ph.D., Ohio State University, 1955
 KAPLAN, HAROLD M., Professor, Ph.D., Harvard University, 1933
 LEHR, ROBERT P., JR., Associate Professor, Ph.D., Baylor University, 1971
 MILLER, DONALD M., Associate Professor, Ph.D., University of Illinois, 1965
 MORELAND, JAMES E., Professor, Ph.D., Louisiana State University, 1961
 MYERS, J. HURLEY, Assistant Professor, Ph.D., University of Tennessee, 1969
 NEQUIN, LYNN G., Assistant Professor, Ph.D., University of Illinois School of Medicine, 1970
 RICHARDSON, ALFRED W., Professor, Ph.D., University of Iowa, 1949
 SOLLBERGER, ARNE, Associate Professor, M.D., Caroline Institute, Sweden, 1957
 STACY, RALPH W., Professor and *Chairman*, Ph.D., Ohio State University, 1948
 TIMMONS, EDWARD H., Associate Professor, D.V.M., University of Georgia, 1963
 WARNER, ALEXANDER C., Assistant Professor, Ph.D., Kent State University, 1970
 YAU, WILLIAM M., Assistant Professor, Ph.D., Medical College of Virginia, 1971

Plant and Soil Science (School of Agriculture)

- COORTS, GERALD D., Professor and *Chairman*, Ph.D., University of Illinois, 1964

ELKINS, DONALD M., Associate Professor, Ph.D., Auburn University, 1967
HILLYER, IRVIN G., Professor, Ph.D., Michigan State University, 1956
JONES, JOE H., Associate Professor, Ph.D., Ohio State University, 1960
LEASURE, J. K., Professor, Ph.D., University of Illinois, 1953
MOWRY, JAMES B., Professor, Ph.D., Rutgers University, 1951
MYERS, OVAL, JR., Associate Professor, Ph.D., Cornell University, 1963
OLSEN, FARREL J., Associate Professor, Ph.D., Rutgers University, 1961
PORTZ, HERBERT L., Professor, Ph.D., University of Illinois, 1954
SATCHELL, DONALD P., Associate Professor, Ph.D., North Carolina State University, 1951
STUCKY, DONALD J., Assistant Professor, Ph.D., Purdue University, 1963
TWEEDY, JAMES A., Professor, Ph.D., Michigan State University, 1966
VARSA, EDWARD C., Assistant Professor, Ph.D., Michigan State University, 1970

Political Science (College of Liberal Arts)

ALEXANDER, ORVILLE, Professor, Ph.D., University of Iowa, 1936
BAKER, JOHN H., Associate Professor, Ph.D., Princeton University, 1961
CHOU, IKUA, Professor, Ph.D., Fletcher School of Law and Diplomacy, 1949
DALE, RICHARD, Associate Professor, Ph.D., Princeton University, 1962
DERGE, DAVID RICHARD, Professor, Ph.D., Northwestern University, 1955
FLENTJE, H. EDWARD, Visiting Associate Professor, Ph.D., University of Kansas, 1970
GARNER, WILLIAM R., Associate Professor, Ph.D., Tulane University, 1963
GOODSELL, CHARLES T., Professor, Ph.D., Harvard University, 1961
HANSON, EARL THOMAS, Professor, Ph.D., University of Illinois, 1948
HARDENBERGH, WILLIAM, Professor, Ph.D., University of Illinois, 1954
JACKSON, JOHN S., III, Associate Professor, Ph.D., Vanderbilt University, 1971
JACOBINI, HORACE B., Professor, Ph.D., University of Kansas, 1951
KAMARASY, EGON K., Assistant Professor, Doctor Politices, Budapest University, Hungary, 1942
KENNEY, DAVID T., Professor, Ph.D., University of Illinois, 1952
KLINGBERG, FRANK L., Professor, Ph.D., University of Chicago, 1938
LANDECKER, MANFRED, Associate Professor, Ph.D., Johns Hopkins University, 1965
LONG, SAMUEL L., Assistant Professor, Ph.D., Indiana University, 1968
MACE, GEORGE R., Associate Professor, Ph.D., Claremont Graduate School, 1963
McGRATH, ROBERT A., Professor, Ph.D., University of Iowa, 1947
MILLER, ROY E., Assistant Professor, Ph.D., University of Illinois, 1971
MORRIS, MILTON D., Associate Professor, Ph.D., University of Maryland, 1970
MORTON, WARD M., Professor, Ph.D., University of Texas, 1941
NELSON, RANDALL H., Professor and *Chairman*, Ph.D., University of Michigan, 1956
PAINE, JOANN P., Associate Professor, Ph.D., University of Oregon, 1967
RIDGEWAY, MARIAN E., Professor, Ph.D., University of Illinois, 1952
SAPPENFIELD, MAX M., Professor, Ph.D., University of Illinois, 1935
SHADE, WILLIAM L., Assistant Professor, Ph.D., University of Florida, 1971
STAUBER, LELAND G., Associate Professor, Ph.D., Harvard University, 1964
TURLEY, WILLIAM S., Assistant Professor, Ph.D., University of Washington, 1972
TURNER, MAX W., Professor, Ph.D., University of Iowa, 1947

VAN DER SLIK, JACK, Associate Professor, Ph.D., Michigan State University, 1967
WASBY, STEPHEN L., Associate Professor, Ph.D., University of Oregon, 1962

Psychology (College of Liberal Arts)

BEKKER, L. DeMOYNE, Associate Professor, Ph.D., Ohio State University, 1968
BUCK, TERENCE D., Associate Professor, Ph.D., University of Missouri, 1968
CARRIER, NEIL A., Professor, Ph.D., University of Michigan, 1956
DEPUE, RICHARD A., Assistant Professor, Ph.D., University of Oklahoma, 1971
DONNERSTEIN, EDWARD I., Assistant Professor, Ph.D., Florida State University, 1972
EHRENFREUND, DAVID, Professor and *Chairman*, Ph.D., State University of Iowa, 1947
HARREN, VINCENT A., Professor, Ph.D., University of Texas, 1964
LADD, CLAYTON E., Professor, Ph.D., University of Iowa, 1960
LEVITT, ROBERT A., Associate Professor, Ph.D., University of Florida, 1965
LIT, ALFRED, Professor, Ph.D., Columbia University, 1948
McHOSE, JAMES H., Professor, Ph.D., State University of Iowa, 1961
McNEEL, STEVEN P., Assistant Professor, Ph.D., University of California at Santa Barbara, 1969
MELTZER, DONALD, Associate Professor, Ph.D., University of Pittsburgh, 1963
MILLER, H. RICHARD, Associate Professor, Ph.D., University of Missouri, 1967
MITCHELL, THOMAS O., Associate Professor, Ph.D., University of Colorado, 1969
MOLFESE, DENNIS L., Assistant Professor, Ph.D., The Pennsylvania State University, 1972
MOLFESE, VICTORIA J., Instructor, M.A., San Francisco State College, 1971
MORELAND, JOHN R., Assistant Professor, Ph.D., University of Massachusetts, 1971
O'DONNELL, JAMES P., Associate Professor, Ph.D., University of Pittsburgh, 1965
PITZ, GORDON F., Professor, Ph.D., Carnegie Institute of Technology, 1963
PURCELL, THOMAS D., Associate Professor, Ph.D., Southern Illinois University, 1965
RADER, GORDON E., Professor, Ph.D., Yale University, 1956
RADTKE, ROBERT C., Associate Professor, Ph.D., State University of Iowa, 1963
RAFFERTY, JANET E., Professor, Ph.D., Ohio State University, 1952
RAMANAIAH, NERELLA, Assistant Professor, Ph.D., University of Oregon, 1971
RIMM, DAVID C., Associate Professor, Ph.D., Stanford University, 1965
RINGUETTE, EUGENE L., Associate Professor, Ph.D., Purdue University, 1963
SCHILL, THOMAS R., Professor, Ph.D., Oklahoma State University, 1963
SCHMECK, RONALD R., Associate Professor, Ph.D., Ohio University, 1969
SHOEMAKER, DONALD J., Professor, Ph.D., Ohio State University, 1955
SNYDER, JOHN F., Associate Professor, Ph.D., Loyola University, 1965
SOMERVILL, JOHN W., Associate Professor, Ph.D., University of Arkansas, 1970
SPALT, LEROY H., Associate Professor, M.D., University of Kentucky, School of Medicine, 1968
TINSLEY, HOWARD E. A., Assistant Professor, Ph.D., University of Minnesota, 1971
WESTBERG, WILLIAM C., Professor, Ph.D., Pennsylvania State University, 1948

Radio-Television (College of Communications and Fine Arts)

- DYBVIG, HOMER E., Associate Professor, Ph.D., Southern Illinois University, 1970
 HILDRETH, RICHARD, Instructor, M.S., Syracuse University, 1968
 KURTZ, JOHN L., Assistant Professor, Ph.D., Southern Illinois University, 1973
 LYNCH, CHARLES T., Associate Professor, Ph.D., Southern Illinois University, 1972
 NORWOOD, DONALD, Assistant Professor, M.A., Louisiana State University, 1962; M.A., West Virginia University, 1966
 OGLESBEE, FRANK W., Assistant Professor, Ph.D., University of Missouri, 1969
 OLSON, THOMAS O., Associate Professor, Ph.D., Wayne State University, 1966
 ROBBINS, BUREN C., Associate Professor, M.A., State University of Iowa, 1935
 SHIPLEY, CHARLES W., Professor and *Chairman*, Ph.D., Florida State University, 1971

Recreation (College of Education)

- FREEBERG, WILLIAM, Professor, D.Rec., Indiana University, 1950
 O'BRIEN, WILLIAM, Associate Professor and *Chairman*, D.Rec., Indiana University, 1967
 TAYLOR, LOREN, Professor, Ed.D., Columbia University, 1957

Rehabilitation Institute (College of Human Resources)

- ALLEN, HARRY A., Associate Professor, Ed.D., University of Arkansas, 1971
 AZRIN, NATHAN H., Professor, Ph.D., Harvard University, 1956
 BENDER, ELEANOR G., Assistant Professor, M.S., Southern Illinois University, 1962
 BRYSON, SEYMOUR L., Assistant Professor, Ph.D., Southern Illinois University, 1972
 CAMPBELL, ROBERT L., Associate Professor, Ph.D., University of Alabama, 1967
 DICKEY, THOMAS W., Assistant Professor, M.A., Southern Illinois University, 1964
 GARDNER, MARGARET S., Associate Professor, Ph.D., Northwestern University, 1960
 GRENFELL, JOHN E., Professor, Ed.D., Oregon State University, 1966
 HAKE, DON F., Associate Professor, Ph.D., Southern Illinois University, 1963
 HAWLEY, IRENE B., Assistant Professor, Ph.D., Southern Illinois University, 1973
 LEE, ROBERT E., Associate Professor, Ph.D., University of Minnesota, 1964
 LORENZ, JEROME R., Assistant Professor, Ph.D., University of Wisconsin, 1973
 MIRANTI, JOSEPH P., Professor, M.D., Loyola University, 1950
 POPPEN, ROGER L., Associate Professor, Ph.D., Stanford University, 1968
 RENZAGLIA, GUY A., Professor and *Director*, Ph.D., University of Minnesota, 1952
 RUBIN, HARRIS B., Associate Professor, Ph.D., University of Chicago, 1965

SANDERS, RICHARD M., Professor, Ph.D., University of North Carolina, 1966
SCHUMACHER, BROCKMAN, Associate Professor, Ph.D., Washington University, 1969
VIECELI, LOUIS, Assistant Professor, M.S.Ed., Southern Illinois University, 1959

Secondary Education (College of Education)

AIKMAN, ARTHUR L., Associate Professor, Ph.D., Southern Illinois University, 1965
ALSTON, MELVIN O., Professor, Ed.D., Columbia University, 1945
BUSER, ROBERT L., Professor and *Chairman*, Ed.D., Indiana University, 1966
DEJARNETT, RAYMOND, Associate Professor, Ph.D., Southern Illinois University, 1964
DIXON, BILLY G., Associate Professor, Ph.D., Southern Illinois University, 1967
DUSENBERY, MIRIAM C., Professor, Ph.D., University of Iowa, 1964
EDWARDS, TROY W., Professor, Ed.D., Indiana University, 1954
FLIGOR, ROSS J., Professor, Ph.D., Michigan State University, 1953
JACKSON, MICHAEL R., Assistant Professor, Ed.D., University of Florida, 1971
JAMES, HELEN H., Associate Professor, Ph.D., University of Colorado, 1970
KEEFER, DARYLE E., Professor, Ph.D., Northwestern University, 1946
LONG, RUTH A., Assistant Professor, Ed.D., Indiana University, 1972
MEES, JOHN D., Professor, Ed.D., Indiana University, 1950
MILLER, HARRY G., Associate Professor, Ed.D., University of Nebraska, 1970

Sociology (College of Liberal Arts)

ALIX, ERNEST K., Associate Professor, Ph.D., Southern Illinois University, 1966
BROOKS, MELVIN, Associate Professor, Ph.D., University of Wisconsin, 1941
EYNON, THOMAS G., Professor, Ph.D., Ohio State University, 1959
GASTON, JERRY C., Associate Professor, Ph.D., Yale University, 1969
HAWKES, ROLAND K., Assistant Professor, Ph.D., Johns Hopkins University, 1967
JOHNSON, ELMER H., Professor, Ph.D., University of Wisconsin, 1950
LANTZ, HERMAN R., Professor, Ph.D., Ohio State University, 1950
LEMERT, CHARLES C., Assistant Professor, Ph.D., Harvard University, 1972
MEDDIN, JAY R., Assistant Professor, Ph.D., University of Kentucky, 1973
MUNCH, PETER A., Professor, Ph.D., University of Oslo, 1946
NALL, FRANK C., II, Associate Professor, Ph.D., Michigan State University, 1959
ROSSEL, ROBERT D., Associate Professor, Ph.D., Yale University, 1966
SNYDER, CHARLES R., Professor and *Chairman*, Ph.D., Yale University, 1954
VOTH, DONALD E., Assistant Professor, Ph.D., Cornell University, 1969

Special Education (College of Education)

BRECHT, RICHARD, Assistant Professor, Ph.D., University of Missouri, 1973
CASEY, JOHN P., Professor, Ed.D., Indiana University, 1963
CROWNER, JAMES, Professor and *Chairman*, Ph.D., Michigan State University, 1960

HISAMA, TOSHIAKI, Assistant Professor, Ph.D., University of Oregon, 1971
JOINER, LEE M., Professor, Ph.D., Michigan State University, 1966
JUUL, KRISTEN D., Professor, Ed.D., Wayne State University, 1953
MORGAN, HOWARD, Professor, Ed.D., Wayne State University, 1962
RAINEY, DAN, Instructor, M.S., Southern Illinois University, 1956
STEPHENS, WYATT E., Professor, Ph.D., University of Oklahoma, 1963
TESKA, JAMES A., Visiting Associate Professor, Ph.D., University of Illinois, 1969

Speech (College of Communications and Fine Arts)

FISH, ROBERT S., Assistant Professor, Ph.D., University of Oklahoma, 1970
HIBBS, R. P., Professor, A.M., University of Wisconsin, 1942
HIGGINBOTHAM, DOROTHY, Professor, Ph.D., Northwestern University, 1961
JENNINGS, RUSSELL W., Associate Professor, Ph.D., Southern Illinois University, 1968
KLEINAU, MARION L., Professor, Ph.D., University of Wisconsin, 1961
McHUGHES, JANET LARSEN, Assistant Professor, Ph.D., Northwestern University, 1972
MICKEN, RALPH A., Professor, *Emeritus*, Ph.D., Northwestern University, 1948
NORWOOD, ELIZABETH, Assistant Professor, Ph.D., West Virginia University, 1973
PACE, THOMAS J., Professor, Ph.D., University of Denver, 1957
POTTER, DAVID J., Professor, Ph.D., Columbia University, 1943
SANDERS, KEITH R., Associate Professor, Ph.D., University of Pittsburgh, 1968
SMITH, WILLIAM D., Associate Professor, Ph.D., Southern Illinois University, 1964

Speech Pathology and Audiology (College of Communications and Fine Arts)

ANDERSON, JOHN O., Professor, Ph.D., Ohio State University, 1950
BLACHE, STEPHEN E., Assistant Professor, Ph.D., Ohio University, 1970
BRUTTEN, GENE J., Professor, Ph.D., University of Illinois, 1957
BRACKETT, ISAAC P., Professor, Ph.D., Northwestern University, 1947
COPELAND, ALFRED B., Associate Professor, Ph.D., University of Washington, 1964
HALL, DONALD E., Assistant Professor, Ph.D., Ohio University, 1971
HOSHIKO, MICHAEL S., Professor, Ph.D., Purdue University, 1957
MONCUR, JOHN P., Professor and *Chairman*, Ph.D., Stanford University, 1950
PACE, SUE A., Associate Professor, Ph.D., Northwestern University, 1966

Technology (School of Engineering and Technology)

BARBAY, JOSEPH E., JR., Assistant Professor, Ph.D., University of Missouri at Columbia, 1971
BESTERFIELD, DALE H., Assistant Professor, Ph.D., Southern Illinois University, 1971
DUNNING, E. LEON, Professor and *Chairman*, Ph.D., University of Houston, 1967

- JOHNSON, MARVIN E., Professor, Ed.D., University of Missouri at Columbia, 1959
KLOPP, MARK E., Associate Professor, M.S.Ed., Pennsylvania State University, 1954
MOELLER, C. MERRILL, Associate Professor, M.S.C.E., Kansas State University, 1951

Theater (College of Communications and Fine Arts)

- CANNON, JOHN, Assistant Professor, M.F.A., Carnegie-Mellon University, 1968
GORDON, LONNY JOSEPH, Assistant Professor, M.F.A., University of Wisconsin, 1967
McLEOD, ARCHIBALD, Professor and *Chairman*, Ph.D., Cornell University, 1943
MARSHALL, HERBERT, Professor, 1966
MOE, CHRISTIAN H., Professor, Ph.D., Cornell University, 1958
PAYNE, DARWIN, Assistant Professor, M.F.A., Southern Illinois University, 1955
STEWART-HARRISON, EELIN, Associate Professor, Ph.D., Louisiana State University, 1968
STRAUMANIS, ALFREDS, Assistant Professor, Ph.D., Carnegie Institute of Technology, 1966

Thermal and Environmental Engineering (School of Engineering and Technology)

- CHEN, JUH W., Professor and *Chairman*, Ph.D., University of Illinois, 1959
COOK, ECHOL E., Assistant Professor, Ph.D., Oklahoma State University, 1970
HESKETH, HOWARD E., Associate Professor, Ph.D., Pennsylvania State University, 1968
JEFFERSON, THOMAS B., Professor, Ph.D., Purdue University, 1955
KENT, ALBERT C., Associate Professor, Ph.D., Kansas State University, 1968
MUCHMORE, CHARLES B., Associate Professor, Ph.D., Southern Illinois University, 1970
O'BRIEN, WILLIAM S., Assistant Professor, Ph.D., West Virginia University, 1972
PEARSON, SONNY W., Associate Professor, Ph.D., University of Arkansas, 1968
PETRIE, THOMAS W., Assistant Professor, Ph.D., University of Minnesota, 1969

Zoology (College of Science)

- ANTHONEY, TERENCE R., Assistant Professor, M.D., University of Chicago, 1968
BEATTY, JOSEPH A., Associate Professor, Ph.D., Harvard University, 1969
BLACKWELDER, RICHARD E., Professor, Ph.D., Stanford University, 1934
BRANDON, RONALD A., Associate Professor, Ph.D., University of Illinois, 1962
DYER, WILLIAM G., Associate Professor, Ph.D., Colorado State University, 1965
ENGLERT, DuWAYNE C., Associate Professor, Ph.D., Purdue University, 1964
FISHER, HARVEY I., Professor, Ph.D., University of California at Berkeley, 1942
GALBREATH, EDWIN C., Professor, Ph.D., University of Kansas, 1951
GAROIAN, GEORGE, Associate Professor, Ph.D., University of Illinois, 1956

- GEORGE, WILLIAM G., Associate Professor, Ph.D., University of Arizona, 1961
HAAS, HERMANN J., Professor, Doctor, University of Göttingen, Germany, 1954
HEIDINGER, ROY C., Assistant Professor, Ph.D., Southern Illinois University, 1970
KLIMSTRA, WILLARD D., Professor, Ph.D., Iowa State University, 1949
LeFEBVRE, EUGENE A., Associate Professor, Ph.D., University of Minnesota, 1962
LEWIS, WILLIAM M., Professor and *Chairman*, Ph.D., Iowa State University, 1949
MARTAN, JAN, Associate Professor, Ph.D., University of Oregon, 1963
McPHERSON, JOHN E., JR., Assistant Professor, Ph.D., Michigan State University, 1968
PAPARO, ANTHONY A., Assistant Professor, Ph.D., Fordham University, 1969
SHEPHERD, BENJAMIN A., Associate Professor, Ph.D., Kansas State University, 1970
STAHL, JOHN B., Associate Professor, Ph.D., Indiana University, 1958
STAINS, HOWARD J., Professor, Ph.D., University of Kansas, 1955
WARING, GEORGE H., Associate Professor, Ph.D., Colorado State University, 1966

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