

1965

1965-1967 Southern Illinois University Bulletin (Graduate School Catalog)

Southern Illinois University Carbondale

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*Graduate School
Catalog
1965-1967*

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Southern Illinois University Bulletin

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.*

*Graduate School
Catalog
1965-1967*



Southern Illinois University Bulletin

SOUTHERN ILLINOIS UNIVERSITY BULLETIN
VOLUME 7, NUMBER 5
MAY, 1965
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December.

This Issue.....

of the *Southern Illinois University Bulletin* covers in detail questions concerning the Graduate School and applies to both the Carbondale Campus and the Edwardsville Campus. It supercedes Volume 3, Number 9.

THE FOLLOWING issues of the Southern Illinois University Bulletin may be obtained free from Central Publications, Southern Illinois University, Carbondale, Illinois 62903.

Schedule of Classes. Please specify *quarter* (fall, winter, spring, or summer) and *campus* (Carbondale or Edwardsville).

Graduate Catalog.

Division of Technical and Adult Education.

Financial Assistance.

Undergraduate Catalog. The catalog will be available (by June, 1965) for examination in high school guidance offices and libraries throughout Illinois and in some other states. Copies will be furnished free to educational institutions upon request and to new students upon matriculation. The catalog may be purchased at the University Bookstore for \$1; mail orders should be sent to Central Publications and must include remittance payable to Southern Illinois University.

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University Calendar



<i>FALL, 1965</i>	New Student Week	Sunday–Tuesday, September 19–21
	Quarter Begins	Wednesday, September 22
	Thanksgiving Vacation	Wednesday, 12 Noon–Monday, 8 A.M., November 24–29
	Quarter Ends	Saturday, December 18
<i>WINTER, 1966</i>	Quarter Begins	Monday, January 3
	Quarter Ends	Saturday, March 19
<i>SPRING, 1966</i>	Quarter Begins	Wednesday, March 23
	Memorial Day Holiday	Monday, May 30
	Quarter Ends	Wednesday, June 8
	Commencement (Edwardsville)	Thursday, June 9
	Commencement (Carbondale)	Friday, June 10
<i>SUMMER, 1966</i>	Quarter Begins	Monday, June 13
	Independence Day Holiday	Monday, July 4
	Quarter Ends	Saturday, August 27
	Commencement (Carbondale)	Saturday, August 27
	Commencement (Edwardsville)	Sunday, August 28
<i>FALL, 1966</i>	New Student Week	Sunday–Tuesday, September 18–20
	Quarter Begins	Wednesday, September 21
	Thanksgiving Vacation	Wednesday, 12 Noon–Monday, 8 A.M., November 23–28
	Quarter Ends	Saturday, December 17
<i>WINTER, 1967</i>	Quarter Begins	Monday, January 2
	Quarter Ends	Saturday, March 18
<i>SPRING, 1967</i>	Quarter Begins	Wednesday, March 22
	Memorial Day Holiday	Tuesday, May 30
	Quarter Ends	Wednesday, June 7
	Commencement (Carbondale)	Thursday, June 8
	Commencement (Edwardsville)	Friday, June 9

CLASSES BEGIN on the second day of the quarter, except that the evening classes (5:45 P.M. or later) on the Carbondale Campus begin on the first night of the quarter.



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GRADUATE INSTRUCTION at Southern Illinois University is the responsibility of the Graduate Faculty, which is selected from the faculties of the several instructional units at Carbondale and Edwardsville. Although the Graduate Faculty is not departmentalized, even those faculty members who participate in interdisciplinary programs are affiliated with specific disciplines as follows:

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 William Wagman, Ph.D. (Columbia)
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 William E. O'Brien, M.S. in P.Ed.
 (Indiana)
 William H. Ridinger, Ed.D. (New York
 University)
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 Guy A. Renzaglia, Ph.D. (Minnesota)
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 R. Jean Fligor, Ph.D. (Michigan State)
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 Daryle E. Keefer, Ph.D. (Northwestern
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 Clarence D. Samford, Ph.D. (New York)
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 (Northwestern)
 Mary M. Brady, Ed.D. (New York)
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 Douglas M. More, Ph.D. (Chicago)
 Peter A. Munch, Ph.D. (Oslo)
 Louis Petroff, Ph.D. (Southern
 California)
 Richard W. Poston, B.A. (Montana)
 Wilson Record, Ph.D. (California)
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 (Pennsylvania)
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 George M. Stabler, Ph.D. (Michigan
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 Jack B. Thomas, Ph.D. (Indiana)
 William J. Tudor, Ph.D. (Iowa State)
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 Ann Lee Carey, M.S. (Southern Illinois)
 Clifton Cornwell, Jr., M.A. (Missouri)
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 Robert Hawkins, Ph.D. (Northwestern)
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Mordecai Corelik
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Harold E. Broadbooks, Ph.D. (Michigan)
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The Graduate School

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AS ONE OF the more rapidly growing universities of the United States, Southern Illinois University offers unusual opportunities for graduate study. The dynamic developments affect the graduate programs, many of which have characteristics of flexibility and experimentation less frequently found in mature universities. The University currently offers on its Carbondale Campus the master's degree in 49 fields of specialization, the specialist's certificate, or sixth year program, in education, and the Doctor of Philosophy degree in 18 fields. At its Edwardsville Campus the master's degree is offered at the present time in education, as is the specialist's certificate.

THE ROLE OF THE GRADUATE SCHOOL

No other educational agency has a greater responsibility than a graduate school. It is a repository of knowledge, a seeker after truth, a guardian of understanding, in a world too often alien to those roles. Its task is to liberate thought and its expression, to foster the means of scholarly investigation, to remain sharply critical of all who sink comfortably into a complacent *status quo*. Its students it inspires for study, its faculty for instruction, and both for critical inquiry. Among the public it promotes and defends the search after truth, and everywhere seeks to create a world in which thought and data may be freely interchanged.

The Graduate School of Southern Illinois University is cognizant of these ideals and objectives and seeks to achieve them through a carefully organized and strongly supported program of instruction and research. Through programs of assistance to candidates for advanced degrees; through its library, museum, and University Press; through its classrooms and laboratories; and through the achievements and high standards of its graduate faculty, it encourages the pursuit of excellence.

FELLOWSHIPS AND ASSISTANTSHIPS

Graduate fellowships are available in all areas of graduate study, upon application to the appropriate chairman, and are awarded by the Graduate School upon the basis of scholarship. Recipients are permitted to carry normal graduate schedules. The stipend for three quarters is normally \$1,620-\$1,890, plus remission of tuition but not other fees. Fellowships are ordinarily renewable for the summer quarter following the period of appointment. Students seeking the master's degree may hold

a fellowship for no more than four quarters; while doctoral students are limited to a total of eight. The fellowship holder has the obligation of carrying out an assignment, at the direction of his chairman, amounting to no more than ten hours per week. Applications should be made before February 1 preceding the academic year for which the fellowship is desired. Inquiries may be addressed to the dean of the Graduate School, or to the major department.

Graduate assistantships are available in a number of departments and research agencies. These positions pay a stipend which ranges from \$1,800 to \$3,600 for three quarters, with the exact amount depending upon the assignment and experience, plus remission of tuition but not other fees. Service of twenty hours per week, or a corresponding load in teaching or research, is required. Graduate assistants must carry no more than 12, and no less than 6, hours of graduate credit per quarter. Inquiries should be addressed to the appropriate chairman before February 1 preceding the academic year for which the assignment is sought.

A limited number of graduate assistantships are awarded to persons in student personnel work who are also resident fellows. Recipients are limited to 12 hours of credit per quarter. They receive room, board, remission of tuition but not other fees, and a stipend of approximately \$80 per month.

Research assistantships are available in a number of research agencies and projects. They ordinarily pay \$180-\$300 per month, with the exact amount determined by the assignment, plus remission of tuition but not other fees. Service equivalent to twenty hours per week is required. Inquiries should be addressed to the appropriate chairman or research director before February 1 preceding the academic year for which the assignment is sought.

HOUSING

Single graduate students will generally find it desirable to locate private housing facilities. The Housing Office maintains current information on rooms, apartments, houses for rent or sale, and trailer parks and can assist in locating accommodations. All arrangements for housing and all business transactions in the matter of housing are the sole responsibility of the student and the owner of the housing facility.

Current information concerning off-campus married housing facilities is available in the Housing Office. Experience has shown that satisfactory arrangements cannot be made by mail, a personal visit is usually required. Prices vary widely, ranging from \$20 per month for trailer spaces to \$100 or more per month for houses.

UNIVERSITY HOUSING

The University has no housing for students on the Edwardsville Campus. At Carbondale, University housing for married students includes 272 furnished one-bedroom, two-bedroom, and efficiency apartments and a

51-space trailer court. Because the demand for University housing for married students exceeds the supply, information should be requested from the Housing Office as early as possible.

ADMISSION TO THE GRADUATE SCHOOL

An applicant must meet the scholastic requirements of the University and be accepted by the Graduate School and as a major by one of its departments or divisions. The applicant's grade point average for previous college work will largely determine whether his admission to the Graduate School will be granted unconditionally or conditionally, or denied.

Application forms may be obtained from the Admissions Office. Students will not be informed of their admission status until after complete and official transcripts of all previous college work are on file in the Admissions Office, and the questions of admission to the Graduate School and acceptance for the major have been determined.

To permit sufficient time for these actions to be satisfactorily completed, there are deadlines for receipt of applications and official transcripts from each previous institution attended, as follows: the second Saturday in July for admission to the fall quarter, the last Saturday in October for the winter quarter; the last Saturday in January for the spring quarter; and the last Saturday in March for the summer quarter. Applications which are incomplete on the deadline date or are received later will be granted unclassified (non-degree) admission status for the quarter for which admission was originally sought. The application papers will continue to be processed for admission as a degree-seeking student but only for the quarter following the one originally applied for. If the student decides to enter as an unclassified student, this will in no way influence the decision relative to his acceptance as a degree candidate. Also, whether the work taken as an unclassified student will later count toward a degree will be subject to later decision by the Graduate School and the disciplines concerned.

A student who wishes to enter the Graduate School immediately after graduation may submit his application when he is within one quarter or semester of graduation. A transcript showing the work he has completed and the courses he is taking, together with a statement from his registrar that graduation will follow successful completion of those courses, is also necessary.

An undergraduate student who is within 16 quarter hours of meeting requirements for the bachelor's degree may take courses for graduate credit by applying for admission to the Graduate School and obtaining approval for the proposed major from the department concerned. Undergraduate students who take such courses for graduate credit must obtain the approval of the dean of the Graduate School at the time of registration.

A student who holds a bachelor's degree and who does not wish to become a candidate for a higher degree or for another bachelor's degree

but who wishes to take work in the University should apply for admission as an unclassified graduate student.

A student who is applying for a graduate assistantship or fellowship and who submits a transcript in support of that application must also submit an admission application and transcripts directly to the Admissions Office for admission processing.

ADMISSION TO GRADUATE STUDY AT THE LEVEL OF THE MASTER'S DEGREE

Admission to graduate study is a three-part process. The first step is submission of the required application and transcripts to the Admissions Office; the second is admission to the Graduate School; and the third is approval for the particular major indicated on the application.

In order to receive unconditional admission for study at the master's level, an applicant must hold a bachelor's degree and have a grade point average of 3.7 or higher, based upon a five point scale in which C equals 3.0. A student with an average of 3.4 through 3.69 may be granted conditional admission and will remain in conditional status until he earns 15 or more hours in graduate-level courses without obtaining more than one C grade and without obtaining any grade lower than C during the conditional period. No credit earned of C or lower while on conditional status will be applied on a master's program. Failure to meet these conditions will result in the student's being dropped from the degree program. He may then continue only as an unclassified student. An undergraduate average of less than 3.4 will permit admission only as an unclassified student during which time the student may attempt to qualify for conditional admission by earning 12 to 24 hours in 300- or 400-level courses with at least a 4.0 average. This work will presumably be taken in the area or areas in which the student desires to be admitted. However, none of this work will be applicable to the degree, and the student has no assurance that he will be accepted on a conditional status after having taken this course of action.

Graduates of institutions of limited accreditation who have a 3.4 average or higher may be granted conditional admission, depending upon the merits of the institution concerned.

ADMISSION TO ADVANCED GRADUATE STUDY

Admission to advanced graduate study is a three-part process. The first step is submission of the required application and transcripts to the Admissions Office; the second is admission to the Graduate School; and the third is approval for a particular major indicated on the application.

Admission to the Sixth-Year Specialist's Certificate program is based on an applicant's previous academic record, his educational experience, and his proposed goal. A master's degree from a recognized institution is regarded as the basic academic requirement for one wishing to pursue the sixth-year program.

Admission to the Graduate School on the doctoral level requires an accredited master's degree or its equivalent, an average in graduate

work of 4.25 or above on a 5-point grading scale, and acceptance for the major.

Through the Admissions Office, the dean of the Graduate School informs each student of any conditions which must be fulfilled before the major can be finally approved. Entrance examinations may be required in any case prior to action on the major proposed by the applicant.

ADMISSION OF FOREIGN STUDENTS

A foreign student is subject to all admission regulations and procedures described above.

Each foreign student must submit, in addition to the regular admission papers, a questionnaire for foreign students showing all previous schooling. The foreign student must also submit an official statement showing sufficient proficiency in English to do successful college work plus letters of recommendation from professors in the student's major field. These letters should specify the student's rank in a particular class or college. The Admissions Office will supply the student with the necessary forms and specific information. Such a student who has been notified that he is eligible for admission must show documentation as to his financial security as directed. The University does not assume responsibility for a student who arrives with inadequate resources.

ADVISEMENT

Each student admitted to the Graduate School is assigned one or more advisers representing his major and minor fields. The adviser assists the student in making out his program of studies, both quarter-by-quarter and long-range. He should arrange a conference with his adviser as early as possible so that his over-all program may be planned. Later conferences should be scheduled whenever they become necessary. As soon as the student gains approval for a thesis topic and thesis director, the latter is designated as chairman of the advisory committee. This committee advises him in the preparation of the thesis or dissertation, evaluates the work when completed, and supervises the final examination, written or oral, when one is required for his major.

The maximum burden of course work for graduate students during a quarter is 18 hours; 12 hours is considered to be a normal load. The maximum for graduate assistants, research assistants, and assistant instructors, who are employed half-time, is 12 hours; for persons who are otherwise employed full-time it is 8. Graduate fellows may in ordinary circumstances carry full loads. These maxima may be exceeded only with the written permission of the dean of the Graduate School.

A graduate student is expected to plan his work carefully; hence program changes after registration should seldom be necessary. Such changes must be approved by the student's chief adviser and the dean of the Graduate School. They may involve the payment of a program

change fee. Program change cards may be obtained from the Graduate Office.

The graduate student must assume responsibility for his progress by keeping an up-to-date record of the courses he has taken and by consulting periodically with his adviser. Responsibility for errors in program or in interpretation of regulations of the Graduate School and the University rests entirely upon the student. Advice is always available on request.

Since graduate work is carried on at both the Carbondale and Edwardsville campuses, it is the student's responsibility to see that his records in the Graduate Office, Registrar's Office, and with his major adviser are brought together on the campus where he wishes to graduate, well in advance of the time of graduation. Student records cannot be processed and the student approved for graduation unless these records are available on the campus where graduation is to occur at least six weeks in advance of the time of graduation.

GRADUATE ADVISERS

The first-named person is a Carbondale representative responsible for approving graduate plans of study. The second and third are graduate advisers at Alton and East St. Louis, respectively.

Accounting—Ralph D. Swick
 Agricultural Industries—Walter J. Wills
 Animal Industries—Alex Reed
 Anthropology—Philip J. C. Dark
 Art—Herbert L. Fink, John A. Richardson
 Biological Sciences—William C. Ashby,
 Ralph Axtell, Joseph S. Davis
 Botany—Robert H. Mohlenbrock
 Business—Henry J. Rehn, Walter L.
 Blackledge, John J. Glynn
 Chemistry—James W. Neckers, Marinus
 P. Bardolph, William J. Probst
 Community Development—Richard C.
 Franklin
 Design—Harold L. Cohen
 Early Childhood Education—
 Rebecca Baker
 Economics—Robert G. Layer
 Educational Administration and Super-
 vision—J. H. Hall, H. Bruce Brubaker,
 Harry H. Smith
 Elementary Education—Harold Lerch,
 David E. Bear, Robert H. Steinkellner
 English—Howard Webb, William
 Slattery, Stella Revard
 Foreign Languages—J. Cary Davis,
 Alfred G. Pellegrino
 Forestry—John Andresen
 Geography—Robert A. Harper, Melvin
 Kazeck
 Geology—Stanley E. Harris
 Government—Orville Alexander, (none),
 William Goodman

Guidance (Educational Psychology)—
 Thomas E. Jordan, Erwin Brinkmann,
 Raymond E. Troyer
 Health Education—Donald N. Boydston,
 Richard D. Spear
 Higher Education—George H. Hand
 History—George W. Adams, (none),
 Allan J. McCurry
 Home Economics—Eileen E. Quigley
 Industrial Education—Ralph O.
 Gallington
 Instructional Materials—Paul R. Wendt,
 Elmer H. Wagner
 Inter-American Studies—Albert W. Bork
 Journalism—Bryce W. Rucker
 Management—Henry J. Rehn
 Marketing—Paul M. Hoffman
 Mathematics—John M. H. Olmsted,
 Robert N. Pendergrass, Cellie C.
 Oursler
 Microbiology—Maurice Ogur
 Music—Robert E. Mueller, Lloyd G.
 Blakely
 Philosophy—Lewis E. Hahn
 Physical Education (Men)—Edward J.
 Shea, Walter C. Klein, Walter C. Klein
 Physical Education (Women)—Dorothy
 Davies
 Physical Sciences—(chairmen of the fac-
 ulties involved)
 Physics—Martin J. Arvin, Richard
 Boedeker, William Shaw
 Physiology—Harold M. Kaplan

Plant Industries—Alfred B. Caster
 Psychology—David Ehrenfreund
 Public Administration—Seymour Z.
 Mann, Edwardsville
 Radio-Television—(none), Harry M.
 Lyle, (none)
 Recreation and Outdoor Education—
 William H. Freeberg
 Rehabilitation Counseling—Guy A.
 Renzaglia
 Secondary Education—Clarence D.
 Samford, Myllan Smyers,
 Gordon C. Bliss
 Secretarial and Business Education—
 Harves C. Rahe, Mary M. Brady,

Keneth E. Martin
 Social Studies—William A. Pitkin
 Sociology—Charles R. Snyder, Robert B.
 Campbell
 Special Education—B. Elizabeth McKay,
 Orval C. Johnson, Mark Tucker
 Speech—Ralph A. Micken, Hollis L.
 White
 Speech Correction—Isaac P. Brackett,
 Hollis L. White
 Technology—Julian H. Lauchner
 Theater—Archibald McLeod, Andrew J.
 Kochman
 Transportation—Alexander R. MacMillan
 Zoology—William M. Lewis

BULLETINS

The *Southern Illinois University Bulletin* is published by the University in the issues listed on page ii.

TUITION AND FEES

The tuition and fees charged students are established by the Board of Trustees and are subject to change whenever conditions make changes necessary. At the present time, fees per quarter for graduate students are as follows:

Tuition	\$42.00*
University Center Fee	5.00
Student Activity Fee	10.50
Student Welfare and Recreational Facilities Building Fund Trust Fee	15.00
Total	<u>\$72.50</u>

Graduate students registered for 8 or fewer hours pay one-half tuition, full university center fee, and have an option on paying the student activity fee. The student activity fee includes the fees for limited hospitalization, entertainment, athletics, the student newspaper and yearbook, and such other privileges as may be provided.

Graduate assistants and fellows do not pay tuition and have an option on paying the student activity fee. They pay other fees.

In addition to the above fees, a student is subject to certain other charges under the conditions listed below:

1. A matriculation fee of \$5, which is assessed a graduate student the first time he registers if he is not a graduate of Southern Illinois University.

2. A late registration fee, which is \$2 for the first day and which increases \$1 each day to a maximum of \$5 when a student registers after the regular registration period has ended.

* Out-of-state students (non-Illinois residents) pay \$122 tuition rather than \$42.

3. A \$2 program-change charge whenever a student changes his program from the one for which he originally registered, unless the change is made for the convenience of the University.

4. A graduation fee of \$17; and, for doctoral candidates, a dissertation microfilming fee of \$25-\$35, depending upon the service selected.

5. Other charges which a student may incur are those for field trips, library fines, and excess breakage. Also a student taking a course involving use of materials, as distinct from equipment, will ordinarily pay for such materials.

GRADUATE DEGREES OFFERED

Graduate degrees are available in the following fields:

MASTER OF ARTS

Anthropology
Art
Botany
Chemistry
Economics
English
Foreign Languages
Geography
Government
History
Inter-American Studies
Journalism
Mathematics
Microbiology
Philosophy
Physical Sciences
Physics
Physiology
Psychology
Rehabilitation
Sociology
Speech
Speech Correction
Theater
Zoology

MASTER OF FINE ARTS

Art

MASTER OF MUSIC

Music

MASTER OF MUSIC EDUCATION

Music

MASTER OF SCIENCE

Agricultural Industries
Animal Industries

Biological Sciences
Botany
Business
Chemistry
Community Development
Design
Economics
English
Forestry
Geography
Geology
Home Economics
Industrial Education
Journalism
Mathematics
Microbiology
Physical Sciences
Physics
Physiology
Plant Industries
Psychology
Rehabilitation
Sociology
Speech
Speech Correction
Technology
Theater
Transportation
Zoology

MASTER OF SCIENCE IN EDUCATION

Art
Biological Sciences
Chemistry
Educational Administration and Supervision
Elementary Education
English
Foreign Languages
Geography
Guidance

Health Education
Higher Education
Home Economics
Industrial Education
Instructional Materials
Mathematics
Physical Education
Physical Sciences
Physiology
Recreation and Outdoor Education
Secondary Education
Secretarial and Business Education
Social Studies
Special Education
Speech
Speech Correction
Technology
Theater

DOCTOR OF PHILOSOPHY

Anthropology
Botany
Chemistry
Economics
Education
English
Geography
Government
Home Economics
Journalism
Microbiology
Philosophy
Physiology
Psychology
Sociology
Speech
Speech Correction
Zoology

MASTER'S DEGREES

GENERAL REQUIREMENTS

Forty-eight hours of acceptable graduate credit are required for the master's degree, except in fine arts, where 60 hours are necessary, and in psychology, rehabilitation counseling, and college student personnel work, where 72 hours are required. At least 24 hours must be earned in courses numbered 500 or above. No more than 16 hours earned for work done at another university or in extension, or both together, may be counted toward the degree. The student should not expect that work presented for transfer credit will automatically be accepted at face value. An evaluation is made in every case and may result in a reduction of the credit offered. Only in unusual circumstances will transfer credit be given for work bearing the grade of *C* or below. No credit toward the degree may be earned in correspondence; and only credit earned within a six-year period preceding the completion of requirements for the degree will be counted toward it.

Ordinarily a graduate student is expected to select both a major and a minor field, but he may be permitted by his advisory committee and the dean of the Graduate School to concentrate his efforts in one particular area of study. The graduate major, in most fields, consists of a minimum of 30 hours of credit in the area of special concentration; some fields, however, require as many as 40 hours for the major, in which case no minor is required. The graduate minor consists of a minimum of 15 hours. A student may have a double major recorded upon completing the necessary number (60 hours) of designated courses. Credit counted toward a master's degree at Southern or at another institution may not be used toward another master's degree at Southern.

Grades are recorded by the letters *A*, *B*, *C*, *D*, and *E*. An average of *B* (4.0) in all courses taken for graduate credit is a prerequisite of the master's degree. Credit for any course for which the grade given is below *C* will not be counted toward the degree. If a graduate student fails to complete a course by the end of the quarter, he may be given a grade of "deferred." Such a grade should be given for uncompleted work in progress, such as research or thesis work. A student who fails to complete a course, or all the requirements of a course, may be given a *W* grade, with an indication of the last week the student attended. A letter grade need not accompany the *W*, in the case of graduate students, regardless of the last week of attendance. A student wishing to remove a *W* should not register again for the course, but should complete work for the first registration.

Each candidate for the master's degree shall either write a thesis, which may be counted for not more than 9 nor less than 5 hours of credit, carry out a special project, or take specific courses on the graduate level, as may be recommended by his advisory committee and approved by the dean of the Graduate School. Ordinarily the thesis requirement will be applied, except in programs which have been spe-

cifically approved as non-thesis arrangements. Each student who does not write a thesis must submit to the Graduate School an approved copy of a research paper as evidence of his knowledge of formal research techniques. The subject of the thesis is to be reported to the Graduate School by the student and is to be approved by the chairman of the advisory committee and the dean of the Graduate School at least two quarters before the date of graduation. The completed thesis shall be submitted for evaluation to the members of the student's advisory committee at least four weeks before the expected date of graduation. Two copies of the approved thesis (the original and first carbon) 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.

Each candidate for a master's degree may be required to pass a comprehensive examination covering all his graduate work, including the thesis. This examination may be written or oral, or both, as determined by the student's advisory committee. If a written examination is required, at least half of it shall be of a subjective nature.

Each student seeking a master's degree, and having an undergraduate average below 3.7, must satisfy the graduate English requirement, either by passing the Graduate English Examination or by completing English 391 with a grade of *B* or better. The examination is offered by the Testing Service once each quarter. After a second failure in the examination, a period of six months must elapse before the student may again take it. After three failures, the student may not again attempt the examination, without special permission. After three failures, and passage of English 391 with a grade below *B*, the student will be placed on unclassified status, he may later become a regular student again, upon passage of 391 with a grade of *B* or better. The Graduate English requirement must be satisfied in the quarter preceding the quarter in which the student wishes to receive the master's degree.

Candidates are expected to meet requirements in force during the year of graduation, but due consideration will be given the fact that a student may have been admitted and may have planned his work when other requirements were current. Important changes in requirements are put into effect gradually. Any change in intention, no matter how minor, should be reported to the Graduate School, so that records may be accurately kept. It is especially important that the following data should be kept up to date on the student's record in the graduate office: the major and minor, the degree for which the student is a candidate or a potential candidate, the chairman of the advisory committee, and the thesis adviser.

The following deadlines are stated for the guidance of the candidate for the master's degree, who is advised to plan to finish each task well in advance and reminded that failure to meet an established deadline may result in postponement of graduation.

1. The graduate English test is to be taken by one with undergraduate average below 3.7 during the first quarter in which he is enrolled in a course given for residence credit.

2. Any foreign language requirement is to be met at least three months prior to graduation.

3. The thesis subject is to be approved by the chairman of the advisory committee at least twenty weeks before the date of graduation and is then to be reported by the student to the Graduate School.

4. The student is to supply a copy of his thesis to each member of his committee at least four weeks before graduation.

5. The completed thesis must be reviewed by the dean of the Graduate School at least two weeks prior to graduation. Since the dean may require certain changes, it should be presented for his inspection at least three weeks before graduation.

6. The preliminary checkup and application for graduation are to be made with the Graduate School and the Registrar's Office at least three weeks prior to the graduation date. Application forms, which may be secured from either of these offices, should be completed and returned to the Registrar's Office after payment of the graduation fee at the Bursar's Office.

MASTER OF ARTS AND MASTER OF SCIENCE DEGREES

A reading knowledge of a modern foreign language is required in all cases for the Master of Arts degree. The foreign language requirement is to be fulfilled at least three months prior to graduation. For the Master of Science degree, this requirement is adjusted to the field of study chosen.

The requirement that a thesis be submitted is administered for each individual student by his chief adviser and the dean of the Graduate School. In most cases the requirement is met by the presentation of a formal thesis, written in the conventional manner, rather than by the substitution of specific courses or special projects.

MASTER OF FINE ARTS DEGREE

Sixty hours of acceptable graduate credit are required for the Master of Fine Arts degree, of which a minimum of 24 hours must be on the 500 level. Further information may be obtained by writing the dean of the Graduate School.

MASTER OF MUSIC AND MASTER OF MUSIC EDUCATION DEGREES

Forty-eight hours of acceptable graduate credit are required for the Master of Music and Master of Music Education degrees, of which a minimum of twenty-four hours must be on the 500 level.

MASTER OF SCIENCE IN EDUCATION DEGREE

Forty-eight hours of credit are required for the Master of Science in Education degree. A candidate for the degree who is a prospective teacher in the public schools of Illinois must meet the minimum educational requirements for teaching in Illinois, as established by the State Teacher Certification Board. Any exception to this rule must be approved by the dean of the College of Education and the dean of the

Graduate School. The student should seek counsel regarding the completion of these requirements before his first enrollment for graduate work.

The thesis requirement will be administered for each individual student by the chairman of the major department, the student's chief adviser, and the dean of the Graduate School. For those in educational administration and elementary education, Educational Administration and Supervision 500 or a similar research course and Guidance 420 or 422 will be required in lieu of the thesis. There is no foreign language requirement for the Master of Science in Education degree.

SPECIALIST'S CERTIFICATE

The Specialist in Education Program is for qualified students with master's degrees or their equivalents who wish to pursue a planned Sixth-Year Program leading to specialization in an educational field. Certain Sixth-Year Programs developed and offered in professional education areas have been approved by the Graduate Council in line with the following minimum requirements.

Students seeking admission to the Specialist in Education Program will follow the same procedures that apply to admission to other graduate programs. Admission to the Specialist in Education Program requires a grade point average of 4.25 for graduate work, although the dean of the Graduate School may admit at his discretion persons having lower averages for graduate work. Departments or divisions may establish a higher scholarship requirement for admission and may use additional selective criteria which are appropriate to the specialization field. 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 the 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 or head of the respective department or division.

A minimum of 45 quarter hours of work beyond the master's degree or its equivalent is required. This work must be planned early by the student and his advisory committee, must clearly move the student toward the specialization he seeks, and must conform to a Specialist in Education Program approved by the Graduate Council. A minimum grade point average of 4.25 for all work in the Specialist in Education Program is required. A maximum of 12 quarter hours of credit may be taken at the 400 level. A combined maximum of 9 quarter hours of graduate credit earned in extension and in other graduate schools may be counted. All such work must be approved by the student's advisory committee and must carry a grade of *B* or better. No credit earned through correspondence or used in attaining another degree or certificate may be counted. Credit earned before September, 1966, while the student was on an unclassified status will not count in his program unless approved

by his advisory committee. After September, 1966, no credit earned while the student was on an unclassified status may be counted except with the recommendation of his advisory committee with reference to credit earned while the application for admission was being processed. All credit used must have been earned within seven years prior to the completion of the program.

Full-time, full-load residence of one quarter (or two summer sessions of at least eight weeks each) is required. Students who are employed full-time may not carry more than one course per quarter.

With the prior approval of the student's advisory committee, credit toward the Specialist in Education Program may be earned at both campuses of the University in programs approved on both campuses by the Graduate Council.

DOCTOR OF PHILOSOPHY DEGREE

The minimum requirement for the Doctor of Philosophy degree is 48 hours, or equivalent, beyond the master's degree or its equivalent, plus the dissertation. A total of 96 hours beyond the master's degree or its equivalent is required. All work at other institutions offered in partial fulfillment of requirements for the Ph.D. degree is submitted to the Graduate School for approval when the student seeks admission to candidacy. Any such transfer of credit will be subject to the following rules: (1) that it be made an integral part of the student's total plan; (2) that it be of excellent quality; (3) that it be earned within the preceding five years (credit earned more than five years prior to the request may be evaluated and rejected or accepted for partial value); (4) that in no case will the acceptance of transferred credit reduce the basic residence requirement or reduce such basic tools or requirements as the student's committee may prescribe. No more than 24 hours may be transferred toward the Ph.D. degree, beyond the master's degree or its equivalent, except in cases in which the student's advisory committee recommends that work be taken elsewhere.

An average of 4.25 ($A = 5$) is required, as a minimum, for the Ph.D. degree. No course in which the grade is below *C* counts toward the degree; however, the grade does count in the student's average. Each student admitted to advanced standing in the Graduate School is expected to maintain an average of at least 4.25. Those falling below this level will be subject to review, and may be placed upon unclassified status or dropped from the program.

Competence in two foreign languages, or one language and statistics, shall be required of each candidate for the Doctor of Philosophy degree. The advisory committee is to decide in each case which alternative is to be followed, and which language or languages will be acceptable. Proficiency examinations may be used to test these competencies. If courses are taken to satisfy this requirement, they shall not count toward the minimum credit requirement for the degree. Students whose native tongues are other than English may offer English as one language. A

student who does so may not then offer his native tongue as a second language, but he may offer another language, statistics, or any other approved research tool. This research-tools requirement must be satisfied before the student may be admitted to candidacy.

Examinations will regularly be given in French, German, Italian, Russian, and Spanish by members of the faculties in foreign languages. Examinations will be given in other languages by special arrangement, in cases in which the language is needed in dissertation work. These examinations are given once each quarter. Students may present two or more books or periodicals, totaling no less than 625 pages, suggested by their advisory committees and accepted by the faculties of foreign languages. The examiner will select passages from these books to be translated, with the aid of a dictionary, if necessary. In addition, a general passage must be translated. The required proficiency will approximate that of a student who has completed two years of college language with a *B* average.

Students taking the doctoral foreign language examination will be allowed two failures in a given language, then will be required to take the course 161 in the particular languages in question before being allowed to take the examination again. After a third failure in a given language, the student must successfully petition the dean of the Graduate School before taking the examination a fourth time.

Doctoral candidates may substitute competence in statistics for one foreign language, with the approval of the major department. This competence may be demonstrated by the acceptable completion of a sequence of graduate courses in statistics or by passing a proficiency examination equivalent to the final examination of the final course in a given sequence and administered by its instructor. Candidates who substitute competence in statistics for a foreign language may receive credit toward the doctorate for only those statistics courses taken beyond the basic one-year sequence in statistical inference, such as Mathematics 410–412 and 480–482, and Guidance 422b or Psychology 421, and Guidance 520a or 520b.

A program leading to the Doctor of Philosophy degree requires a minimum of three “years” in resident study at an accredited educational institution. Such years ordinarily are defined as follows:

First year—The time required to fulfill all requirements for the master’s degree or the equivalent.

Second year—The time required to advance from the completion of the first year’s work through the completion of the preliminary examination. This involves obtaining satisfactory grades in an acceptable program of at least 36 hours of work, or its equivalent, completing the research-tools requirement, and passing the preliminary examination.

Third year—The time spent between passing the preliminary examination and the completion of all requirements for the doctor’s degree, including the dissertation, and the final examination. The third “year” may not be shorter than six months.

In order to achieve the Doctor of Philosophy degree one must be

in full-time residence at graduate work at Southern Illinois University for a minimum of two academic years.

A student who spends the first two years in residence at Southern Illinois University may petition to spend the last year *in absentia*. A student who has completed the first year of graduate work elsewhere must be in residence during the two remaining years. In exceptional cases, a student with two years of graduate study elsewhere will be permitted to take the preliminary examination, provided he has fulfilled the research-tools requirement. If such a student passes the preliminary examination, he may complete the requirements for the Ph.D. degree by devoting the third year to research in residence.

Candidates may be given leaves of absence by the dean of the Graduate School (not to exceed one-fourth of the required residence) to make use of special facilities elsewhere.

A student may partially satisfy the residence requirement by attending summer quarters at Southern. Full-time attendance during three summer quarters is the equivalent of one academic year's residence. However, at some time during the second or third year of his doctoral program the student must be in full-time residence at the University through three successive quarters.

The term "residence" as used above means the physical presence of the candidate, from day to day, in the immediate area in which classes are offered, complete University library facilities are available, and academic supervision can be provided at any time at the discretion of the advisory committee. A student shall be considered in full-time residence only during those quarters in which he shall be registered for at least twelve hours of credit, or its equivalent in Dissertation 600. The rate of residence credit given to students carrying less than twelve hours per quarter shall be determined by the Graduate Council.

All work for the Doctor of Philosophy degree must be completed in not more than five calendar years from the close of the quarter in which the student is admitted to candidacy for the degree. If completion of requirements is delayed for reasons beyond the control of the student, he may request an extension of time by petitioning the dean and the Graduate Council, but he should do so only after consultation with his adviser. Under such circumstances, a student may be required to take another preliminary examination and be admitted to candidacy a second time.

A dissertation showing high attainment in independent, original scholarship or creative effort shall be submitted toward the requirements for the Doctor of Philosophy degree. It shall be supervised by a faculty member, who is approved by the dean of the Graduate School, and who thus becomes chairman of the candidate's advisory committee. The topic of the dissertation must be approved by the supervisor and by the dean of the Graduate School before the project is undertaken.

The student must register for the course Dissertation 600 for at least three normal full-time quarters or their equivalent. Students may register for Dissertation 600 on a full-time or fractional basis. In any

case the grade will be deferred until the dissertation is completed and approved.

The dissertation must be approved by the supervisor and at least one other qualified reader before being circulated among advisory committee members. It must be submitted to the committee, in complete and acceptable form, at least one month before the date of graduation.

All dissertations will be microfilmed according to a plan approved by the Graduate School. Three weeks before the date of graduation the candidate must have fulfilled the following requirements:

1. Submission to the Graduate School of two approved, typewritten copies of his dissertation (one the original copy) and a signed microfilm contract.

2. Submission to the Graduate School of an abstract of the dissertation of 600 words or less (or a description of the project, if it is a creative work).

3. Payment of \$25 to cover cost of publication of abstract and micro-filming of the dissertation. If copyright is desired, an additional fee will be required.

SUMMARY OF REQUIREMENTS

1. Forty-eight hours of credit beyond the master's degree, or its equivalent, and the dissertation are required. The total requirement is 96 hours beyond the master's degree or its equivalent.

2. The dissertation shall represent at least three quarters of full-time work and at least 36 hours of credit.

3. Credit up to 24 hours beyond the master's degree may be transferred. Upon the express recommendation of the advisory committee that work be taken elsewhere, more transfer credit may be approved.

4. An average of 4.25 in graduate work is required for admission to a doctoral program and for final qualification for the degree. No credit with a grade below C shall count toward the degree; however, the grade shall count in the student's average.

5. Language proficiencies must be demonstrated by examinations given by the Department of Foreign Languages; proficiency in statistics may be shown by examination or by successful completion of one of three course sequences: Guidance 422b (or Psychology 421), 520-8; Mathematics 410, 411, 412; or 480, 481, 482. Upon petition other research tools may be approved in place of a foreign language or statistics.

6. Two academic years, or the equivalent, of full-time graduate work in residence are a minimum requirement. Each student must spend at least three successive full-time quarters in residence.

7. The degree may not be conferred less than six months, nor more than five years, after admission to candidacy. Admission to candidacy follows successful completion of at least 36 hours of course work, the research-tools requirement, and the preliminary examination.

8. Each student must submit with the approved dissertation a signed microfilm contract and evidence of payment to the University of the microfilm fee.

RESEARCH

Research is an integral part of higher education and is essential to effective teaching at the university level, as well as of value in its own right. Southern Illinois University encourages its faculty members to undertake research and assumes the responsibility of promoting a research program. The dean of the Graduate School is the agent of the University in the stimulation and co-ordination of research.

In keeping with this policy, the University aids individuals and groups interested in research by granting reductions in teaching or administrative loads to compensate for time spent in research and by grants of funds for travel, equipment, supplies, student help, and research assistants. Grants-in-aid for individual research projects are available to faculty members through the special research projects program administered by the Office of Research and Projects, which functions as a part of the Graduate School. The Office of Research and Projects also supervises co-operative research programs and assists applicants in the preparation and submission of research proposals that involve outside support, especially from such sources as government, foundations, or business and industry.

Instructional Units 2

GRADUATE MAJORS on the Carbondale Campus are usually offered on a departmental basis, although a few interdepartmental majors are available. On the Edwardsville Campus the graduate programs are supervised by the various academic divisions.

EDWARDSVILLE

The Master of Science in Education degree, with an academic concentration in elementary education, guidance, administration and supervision, special education, and some areas of secondary education, may be completed on the Edwardsville Campus. Graduate courses are available in most business, fine arts, and liberal arts fields as well as in education.

The Master of Science in Education degree involves 16 hours in basic education courses, 16 hours in an area of concentration, and 16 hours of electives. Each student seeking the master's degree must work out an approved program with the appropriate adviser in education. There are advisers in some of the non-education fields at Alton and East St. Louis who can advise students in their particular subject fields.

Graduate courses taken on one campus of Southern Illinois University may be used for degree-earning purposes at the other campus, but the courses must be ones which the major adviser has approved for the student's program of study. One working for a graduate degree other than the M.S. in Ed. degree or the M.A. degree in English must enroll at Carbondale and have a major adviser there, but he may take part of his work toward a graduate degree or toward a Specialist's Certificate at Alton or East St. Louis, provided that the particular courses needed are available at the latter places and that they have been authorized for his program by his adviser. Students who major in non-educational fields at present must expect to take a substantial part of their graduate work at Carbondale. Their graduate records are kept at Carbondale, and the thesis work and oral examinations are cared for at that campus.

One who wishes to work toward the M.A. degree in English should see the graduate adviser in English, at Alton or East St. Louis.

MASTER OF SCIENCE IN EDUCATION DEGREE

1. General Requirements: The Edwardsville Campus offers the Master of Science in Education degree. A graduate student may obtain the degree by earning a minimum of 48 hours in approved graduate courses

with at least 24 in 500-level courses. Only grades C or higher may be credited toward the master's degree, but a 4.0 (B) minimum average is required for graduation. Each student should write a satisfactory research paper, demonstrate adequate proficiency in the use of English, and pass a comprehensive final examination.

2. *Fields of Specialization*: Designed primarily as a graduate in-service education program, opportunity is provided for specialization in school administration, guidance, or a teaching field. A student with the help of a graduate adviser can plan a tailor-made program which will meet his needs and correlate well with his undergraduate studies. In general, a student will earn 16 hours from a common core of foundation courses in education, 16 hours from the specialized fields of school administration, elementary education, guidance, secondary education, or special education, and 16 hours of electives from professional education or cognate areas. The specialization in secondary education consists of courses in a teaching field and may be supplemented by electives from cognate areas.

3. *Student Option*: All students who have earned graduate credit in an approved master's degree program at the Alton and East St. Louis centers prior to the effective date of the program described above shall be permitted to graduate under the Graduate School rules effective at the time of admission, or shall be permitted to apply their graduate credit toward the Master of Science in Education degree at the Edwardsville Campus.

4. *Certification Prerequisite*: Each student who expects to work in the elementary or secondary schools must meet the requirements for a teacher's certificate appropriate for his area as a prerequisite for completing a master's degree program. Other students who may desire to concentrate in guidance, for future work in business personnel offices or for pastoral counseling, shall meet the appropriate prerequisites for each of these areas. The student's adviser shall determine what prerequisites must be met.

COMMON CORE OF FOUNDATION COURSES

Each student shall take one course from each of groups one and two of the foundation courses listed below and also shall take one course from each of two other groups of foundation courses. When a student has taken any of the listed foundation courses during his undergraduate study or in prior graduate study that will be out-dated for application on a master's degree program, he may substitute for each such course some other graduate course in education that his adviser will approve for use as a part of his hours of foundation work.

1. *Measurement and Statistics*: Guidance 420, Statistics; 422, Educational Measurements I; 426, Individual Inventory; 520, Advanced Educational Statistics; or 522, Educational Measurements II.

2. *Research*: Educational Administration and Supervision 500, Research Methods (required of all).

3. *Curriculum*: Educational Administration and Supervision 460,

The Curriculum; Elementary Education 561, The Elementary School Curriculum; Secondary Education 550, The Core Curriculum; 562, Workshop in High School Curriculum; or Guidance 542, Basic Principles of Guidance.

4. *Developmental Psychology and Learning*: Guidance 511, Educational Implications of Learning Theories; 515, Psychological Aspects of Education; 525, School Behavior Problems and Their Prevention; 562a, Child Development in Education; 562b, Adolescent Development in Education; Special Education 414, The Exceptional Child; or Psychology 407, Theories of Learning.

5. *Social Foundations*: Educational Administration and Supervision 411, Seminar in Instruction; 431, History of Education in the United States; or 554, Contrasting Philosophies of Education; 502, Seminar in Comparative Education.

The student will work out his specialization with a graduate adviser.

CARBONDALE

AGRICULTURAL INDUSTRIES

A Master of Science degree may be earned with a major in agricultural industries. Within the major field two specializations are offered; one is agricultural economics, and the other is agricultural services.

The agricultural economics specialization requires a minimum of 24 hours in courses in agricultural economics and the School of Business. A thesis is required. Graduates from this program are sought by industry and government. Many receive offers of financial assistance for continued work toward the doctoral in agricultural economics. In this program the student may take work in farm credit, farm policy, farm management, and agricultural marketing and prices.

The agricultural services specialization requires a minimum of 24 hours in agriculture. The remaining work may be in any field in the University. A thesis is not required, but an approved research paper must be submitted. This program is designed primarily to meet the needs of individuals wishing to strengthen their training and provide the basis for performing their work more efficiently. The participants include farm advisers, vocational agriculture teachers, soil conservation personnel, and industrial specialists in agriculturally related businesses.

In both master's specializations the individual's course program is designed to fit his particular goals and objectives.

Students interested in agricultural economics on the doctoral level should consult with the Department of Economics in the School of Business concerning approval to major in economics with a specialization in agricultural economics.

For further information concerning the program and availability of assistantships, write to the Chairman, Department of Agricultural Industries.

ANIMAL INDUSTRIES

The Department of Animal Industries offers major work for the Master of Science degree. A minimum of 24 hours in animal industries courses, including a thesis, is required. Programs may be designed to meet the desires of candidates with emphasis upon animal nutrition, breeding, physiology or production of beef, dairy, poultry, sheep, or swine. The fields of major emphasis may include courses in other related departments such as chemistry, microbiology, physiology, and zoology. Graduates from this program wishing to work for a Doctor of Philosophy degree have many opportunities for financial assistance at other institutions.

Students majoring in another department may choose a minor in animal industries.

For information concerning a specific program and assistantships available, write to the Chairman, Department of Animal Industries.

ANTHROPOLOGY

Graduate work is available in anthropology leading to the Master of Arts and the Doctor of Philosophy degrees.

Acceptance for graduate study in anthropology is at the discretion of the Department of Anthropology. When submitting the application for admission, the student must arrange to have sent three letters of recommendation addressed to the chairman of the department, together with a set of transcripts, graduate and undergraduate. The Graduate Record Examination must be taken by all students, who have not done so previously, at the first opportunity after their entry into the department.

No specific program of previous work is required, and applicants with academic degrees in fields other than anthropology are accepted. The Department of Anthropology does not require that every student take a master's degree on his way to the doctorate. Whether he does or not is a matter for decision by the student and the department. The University requires a minimum of 48 hours plus the thesis for the master's degree and a minimum of 96 hours plus the dissertation for the doctorate. These hour-requirements should be regarded as minimal. In the Department of Anthropology, the program of study for each student will be worked out by the student and his adviser, and decisions as to curriculum, research, and examinations will be made on an individual basis. A student's overall progress in his studies is reviewed at the end of each year, or as may be necessary, in order to see that the requirements of the department are being met and that the student's best interests are being served.

For students coming into the department with bachelor's degrees in anthropology, a minor of at least 16 hours is required in another, pertinent field, such as sociology, psychology, geology. This requirement must be fulfilled before a student presents himself for Part II of the General Examination. The student may expect to be examined on his minor field during that examination. For students coming into anthro-

pology with degrees in other disciplines, no minor is required; all study will be concentrated in anthropology, though inter-disciplinary study may be recommended.

The Department of Anthropology normally expects that each student, before he submits his doctoral dissertation, shall have undertaken field work applicable to some anthropological problem approved by the department. It is not necessary that the dissertation be based on this field work, although this is the usual practice.

For both higher degrees, a student must pass both parts of the departmental general examination. Candidates for the master's degree must also pass one language examination and present a thesis. Candidates for the Ph.D. degree must also pass two language examinations, the Special Examination, and present a dissertation.

The language examinations are given by the Department of Foreign Languages, from which current rules of operation should be obtained. They are written and last two hours. The use of a dictionary is permitted. The examinations are in two parts, one covering technical anthropological works and the other non-technical materials. The languages accepted are at the discretion of the Department of Anthropology; those usually recommended are French, German, Russian, and Spanish. A doctoral candidate whose native language is other than English may, in some cases, be permitted to offer English for one language but must pass the Graduate English Examination.

Part I of the general examination consists of the written final examinations for courses 501, 503, 505, 507, 509. A student must pass all of these examinations, whether he attends these courses or not, in order to complete Part I. On completion of Part I, the student may proceed to Part II, which is a three-hour oral examination, provided he has completed requirements for a minor, if pertinent, and one of the foreign language requirements.

After successful completion of the general examination, a student proceeding to present himself as a candidate for the Ph.D. degree will consult with the department in order to select a special field of study in preparation for the special examination. It is expected that the student will spend not less than a year between the successful completion of the general examination before presenting himself for the special examination. A special field of study consists, usually, of two topics with reference to a particular geographical area. The student may not present himself for the special examination until he has completed the second of the foreign language requirements. Upon completion of the special examination, the student becomes a recognized candidate for the degree.

ART

Graduate programs in art lead to the Master of Fine Arts, Master of Arts, and Master of Science in Education degrees. The candidate is expected to select an area of specialization (studio, art history, or art education) around which his program will be planned in consultation with the major professor in that area.

Each program on the master's level requires the successful completion of a thesis and oral examination before the candidate can be certified for graduation. In addition, the M.F.A. degree candidate must present a graduate exhibit of his creative work before the date of graduation, and the M.A. degree candidate must demonstrate a reading knowledge of French or German.

Those seeking the M.S. in Ed. degree are required to complete 16 hours of work advised by the College of Education.

No general statement can be made concerning undergraduate requirements in art for admission to candidacy for one of the graduate degrees. A strong undergraduate major in art is desirable. The student who lacks such preparation may, on the recommendation of his major professor, be required to complete undergraduate deficiencies. In such cases, quality of work rather than appraisal of credit provides the basis for judgment.

The University asserts the right to select an example of the work of each candidate for the master's degree in art. Such works become a part of the permanent collection of student works from which exhibitions may be prepared.

Throughout the year, a program of exhibitions is presented in the Allyn Gallery. Exhibitions are chosen with the intention of providing students and interested public with a continuous experience of viewing and judging significant and representative works of art of contemporary or historical character.

ASIAN STUDIES

Courses available in the field of Asian studies are listed by department and include the following: Agricultural Industries 417, Anthropology 483, 585, Art 571, 572, Economics 461, Geography 401, 522, Government 457, 458-12, 480, 521, 595, History 449, 455, 510, 590, Philosophy 490. Theses and dissertations on Asian topics may be written by students in any of several majors.

Interested graduate students may consult with members of the Committee on Asian Studies in regard to their programs or research. Further information may be obtained by writing to the Committee on Asian Studies or to its members: Floyd F. Cunningham, professor of geography; William H. Harris, professor of philosophy (chairman of the committee, 1964-66); Hellmut A. Hartwig, professor of foreign languages; H. B. Jacobini, professor of government; Joel Maring, instructor in anthropology; Ping-chia Kuo, professor of history; Robert Jacobs, professor of education and co-ordinator of international programs; and Donald A. Wells, associate professor of economics.

A graduate minor is offered in Asian studies, and students who are interested should consult with the chairman of the committee.

BIOLOGICAL SCIENCES

The program for the Master of Science in Education degree in biological sciences in secondary education is jointly administered by the De-

partment of Secondary Education and by the four life science departments (Botany, Microbiology, Physiology, and Zoology). Dr. Clarence D. Samford, of the Department of Secondary Education, is responsible for determining the education courses and for approving and administering the program. Dr. William C. Ashby of the Department of Botany is the delegated adviser in biological sciences. Admission to the program requires undergraduate preparation equivalent to 24 hours in each of two life science departments, and secondary education requirements, including student teaching. Deficiencies in preparation may be made up after conditional admission to the program.

A minimum of 48 hours of approved graduate credit is required for the degree. The normal distribution is 16 hours in education and 32 hours in biological sciences. Students must elect either a two-department or a three-department option for their graduate courses in life science to give adequate breadth in biology. Including the undergraduate preparation, the total work in biological sciences must include a minimum of 4 hours in one department, 15 hours in a second, and 24 hours in each of the other two. The individual program to be followed will depend on the student's needs, interests, and objectives.

BOTANY

Graduate work may be taken in the Department of Botany as a major or minor leading to the Master of Arts, Master of Science, and Doctor of Philosophy degrees and as a part of the program in biological sciences leading to the Master of Science or the Master of Science in Education degree.

Applicants for the advanced degrees must be approved by the department. Queries concerning graduate work in botany should be made to Dr. William D. Gray, graduate adviser in botany. To be eligible for graduate work in botany, the student must have an equivalent to an undergraduate minor in botany. Certain deficiencies may be made up concurrently with graduate work.

In accordance with the general requirements of the Graduate School, a candidate for the Master of Arts or Master of Science degree must complete a thesis.

The Ph.D. degree requires, in addition, a reading knowledge of two foreign languages or one foreign language and statistics, if recommended by the candidate's committee.

BUSINESS

The Departments of Accounting, Management, and Marketing combine in offering a major in business on the graduate level leading to the Master of Science degree. Within the limits of courses offered, the individual candidate may concentrate his work in any of these three areas. All candidates will be expected to offer a substantial amount of work in economics.

Students entering the business program with a liberal arts, engineering, or other non-business background will normally be required

(additionally) to complete certain undergraduate courses in preparation for advanced work in the graduate courses. If no previous work has been taken in business, completion of the work for the Master of Science degree will normally require two years of study. Applicants for admission must complete the Graduate Record Examination.

Courses in these areas may also be taken as a minor by graduate students majoring in other departments of the University.

CHEMISTRY

Graduate courses in chemistry may lead to the Doctor of Philosophy degree or may comprise a major or minor toward the Master of Arts, Master of Science, or Master of Science in Education degree. Interested students should contact the department chairman for further details.

MASTER OF ARTS AND MASTER OF SCIENCE DEGREES

In addition to the general requirements of the Graduate School, minimum requirements for the Master of Arts (or Master of Science) degree in chemistry are as follows:

1. (a) Earned credit, either as an undergraduate or graduate student, in Chemistry 446, 461-12, 490, 575; (b) Earned credit, or proficiency shown in a diagnostic examination, in Chemistry 411, 433, 444;
2. (a) A three-course subject-matter sequence in chemistry at the 500 level; (b) One additional chemistry course at the 500 level in each of two areas other than 2(a); (Chemistry 451-7 may be substituted for *one* of these courses.)
3. A minimum of 5 hours in research and thesis (Chemistry 597);
4. A final oral examination;
5. A reading knowledge of German (or one year of undergraduate credit); and
6. Attendance at seminar (Chemistry 575 or 595).

If an outside minor is chosen, 30 hours of chemistry must be earned.

MASTER OF SCIENCE IN EDUCATION DEGREE

In addition to the general requirements of the Graduate School, minimum requirements for the Master of Science in Education degree with a major in chemistry are as follows:

1. (a) Earned credit, either as an undergraduate or graduate student, in Chemistry 460 or 461-12, 490, 575; (b) Earned credit, or proficiency shown in a diagnostic examination, in Chemistry 411, 433, 444;
2. (a) A two-course, subject-matter sequence in chemistry at the 500 level; (b) One additional 500-level subject-matter course in chemistry; (Chemistry 451-7 may be substituted.)
3. A minimum of 30 hours in chemistry and 15 hours of graduate credit in education, including at least 3 hours for a scholarly report on some phase of chemistry or chemistry education;
4. A final oral examination;

5. A reading knowledge of German, Russian, or French (or one year of undergraduate credit); and
6. Attendance at seminar (Chemistry 575 or 595).

This degree is considered terminal for graduate study in chemistry.

DOCTOR OF PHILOSOPHY DEGREE

1. The courses required shall include those specified for the M.A. degree or their equivalent.
2. In the minor field a minimum of 9 hours at the 500 level is required. In the case of a minor taken outside of the department the requirements are determined by that department.
3. The hours in the major are determined by the staff in the field of chemistry involved with the approval of the advisory committee. Individual variations are expected, but 20-30 hours, exclusive of research, would be a typical program.
4. The minimum in Doctoral Research and Dissertation (Chemistry 598 and 600) is 48 hours.
5. Qualifying examinations must be passed in four of the five fields of chemistry including analytical, biological, inorganic, organic, and physical. These should be taken prior to the completion of 36 hours of course work. One entering with a master's degree should pass these examinations prior to the completion of 15 additional hours.
6. Prior to taking the preliminary examination, language examinations must be passed in two of the following languages: French, German, Russian. It is preferable that one of the languages be German.
7. A written preliminary examination must be passed in the major and minor fields prior to the completion of 96 hours beyond the bachelor's degree. Following this, an oral preliminary examination must be passed.
8. The student is admitted to candidacy for the Ph.D. degree after passing the preliminary examinations and satisfactorily completing 96 hours beyond the bachelor's degree.
9. An oral final examination is given to all candidates after completion of the research and dissertation.
10. All other requirements specified in the bulletin of the Graduate School must be met. These include requirements of residence, grade point average, and thesis procedures.

RESEARCH INTERESTS IN THE DEPARTMENT OF CHEMISTRY

Analytical Chemistry. Instrumental and classical analytical methods; inorganic and organic polarography; reaction mechanisms; millicoulometry; chromatography detectors; microanalysis.

Biochemistry. Structural analysis of polysaccharides; reaction mechanisms of carbohydrates; plant diseases.

Inorganic Chemistry. Preparation, stability, and reaction mechanisms of complexes; Lewis acid-base interactions in nonaqueous solvents.

Organic Chemistry. Organic reaction mechanisms and redox reactions; syntheses as applied to steroids; organic azides and small-ring heterocycles; cyclic ketones and hydrazides; folic acid analogues.

Physical Chemistry. *Ab initio* and semi-empirical quantum chemistry; adsorption, wetting, and kinetics in surface chemistry; electrochemistry; electrodeposition from thiocyanate-cyanide solutions.

COMMUNITY DEVELOPMENT

This curriculum is interdisciplinary. A candidate for the Master of Science degree in community development will take a portion of his work in related academic fields. Depending on his professional plans, it will be possible for him to minor in a field such as agriculture, anthropology, economics, education, geography, government, history, psychology, sociology. Undergraduate work in more than one of these fields is a desirable background for graduate study in community development. Students with inadequate backgrounds may be required to take certain courses to strengthen their preparation.

The period of study and training is planned to encompass one and one-half years. Included must be a minimum of 48 hours of graduate credit, plus a one-year internship in a local community-development program in southern Illinois. Only a limited number of interns can be enrolled in any one year.

The requirements for the Master of Science degree in community development include the following:

1. Twenty-eight to 32 hours in courses specifically designed or approved by the Community Development Institute, to include a thesis or research paper.
2. Sixteen to 20 hours of work in one or more allied fields, such as anthropology, education, psychology, sociology.
3. One year of part-time noncredit graduate internship. (This may be reduced or waived for exceptional students with one or more years of acceptable professional experience in community development work.)
4. Fulfillment of the requirements of the Graduate School.

DESIGN

The Department of Design attempts a generalized rather than a specialized design education. Through his undergraduate years the student is led to treat of man and his environment transactions in terms of whole systems rather than of isolated aspects or component parts. Emphasis is placed on the overall solutions to human problems which may be encompassed through design procedures.

The graduate program of the department continues this broad integrative approach but assumes that, at this level, the student should concentrate his studies in a more closely defined area within which he should work in depth.

It is recognized, however, within the present massive accelerations in the design possibilities of man's control over his environment, that the format of such graduate study should offer the utmost flexibility and capacity for change. The entire graduate program should be viewed as experimental in nature and one whose content and approach will be adjusted according to experience and field developments.

A two-year program of graduate study, leading to the Master of Science degree in design, is offered in the areas listed below. The program requires at least 34 hours of graduate study in the Department of Design; at least 18 hours of study outside the department, selected with the adviser; and 9 thesis hours. Specialized areas are (1) design in education, (2) communications in design, (3) industrial design, (4) environmental planning, and (5) generalized design science, directly oriented toward the design philosophy of R. Buckminster Fuller.

Within the structure of this program, graduates will work in an operational research and workteam organization rather than a formal classroom situation. There will also be the opportunity to participate in seminars and lectures given by distinguished visiting professors to the department and of conducting research under their guidance.

ECONOMICS

Graduate courses in economics may be taken as a major or minor leading to the Master of Arts, Master of Science, and Doctor of Philosophy degrees.

A student may complete requirements for the master's degree through the successful completion of: (a) 48 hours of graduate work, including the master's thesis; or (b) 96 hours of graduate work and successful completion of the preliminary doctoral examination. Each master's degree candidate is required to complete at least 33 hours in economics, including certain required courses.

Graduate students with no undergraduate deficiencies, with no language handicaps, and with no outside demands upon their time may find it possible (by taking the heavy graduate load of 16 hours each quarter) to complete the master's degree in three quarters (roughly nine months). *Most* students who have none of these deficiencies or demands upon their time take three quarters and a summer to complete their master's program. Students with undergraduate deficiencies (determined by the chairman of the Department of Economics), with language difficulties (especially foreign students), or outside demands upon their time should expect to take longer. Such students should plan to be in residence longer than the usual three or four quarters.

The Graduate Record Examination is required of all applicants for admission.

If a student wishes to combine his study of economics with the fields represented in the College of Liberal Arts and Sciences, he should apply for a Master of Arts degree. If he wishes to combine his study of economics with fields represented in the School of Business, the School of Agriculture, or similar schools, he should apply for a Master of Science degree.

A student may complete the requirements for the Doctor of Philosophy degree by taking these steps: (a) completing 48 hours of course work beyond the master's degree, or its equivalent; (b) passing a preliminary examination, usually given upon substantial completion of course work other than thesis; (c) passing the research-tools requirement; (d)

writing a satisfactory doctoral dissertation; and (e) passing the final examination.

The Ph.D. degree candidate may substitute an approved series of mathematics courses or an approved series of statistics courses for one of the two required foreign languages. A final proficiency examination must be successfully passed if the mathematics or statistics sequence is selected.

The preliminary examination will encompass: (a) certain "core" areas of economics; (b) the basic field of economic theory and its history; and (c) four additional "specialized fields" to be chosen from a list currently including international economics, labor, public finance, comparative systems, political economy, quantitative economics, money and banking, economic history and economic growth, and agricultural economics.

After a student has been granted admission to the Graduate School, he should contact the chairman of the Department of Economics. The chairman will refer him to the departmental supervisor of graduate students, who will act as his adviser (or temporarily delegate the task) until the student has chosen his thesis or dissertation topic and a member of the department has consented to direct the project. The thesis or dissertation director will then become the student's adviser and will function together with an advisory committee.

Information on graduate and research assistantships may be obtained from the chairman of the Department of Economics. More detailed descriptions of the M.A., M.S., and Ph.D. degree programs are also obtainable from the chairman.

EDUCATION

One may pursue a program of study leading to the Ph.D. degree in education through any one of three functional areas: curriculum and instruction; educational psychology; educational administration and social and philosophical foundations. Within the functional areas specific emphases are available depending upon the student's interests. For example, in educational psychology he may choose an emphasis in human learning, learning resources, measurement, or special education. In all programs, students must satisfy the general requirements of the Graduate School in addition to the special requirements for a Ph.D. degree in education.

APPLICATION

An applicant must submit, to the co-ordinator of the functional area in which he wishes to do his work, his scores from the Graduate Record Examination and the Miller Analogies test, and other pertinent data. Following review by that area's screening committee, the co-ordinator will inform him of the committee's decision.

ADVISEMENT

For each student, the co-ordinator of his functional area appoints an advisory committee consisting of a sponsor, who is in the student's functional area and who is authorized to direct doctoral dissertations, and two

other members, at least one of whom must be from outside the student's functional area. His tentative program, planned to include all of his graduate study, should be approved at a meeting of the student with his committee. One copy of the approved program is filed in the office of the executive officer for advanced graduate study in education. Appropriate program changes approved by the committee must be recorded on the student's record sheet in the executive office.

PROGRAM REQUIREMENTS

Each student must, during his first year beyond the master's degree or its equivalent, successfully complete one seminar in psychological foundations of education and one seminar in social and philosophical foundations of education. In certain functional areas specific courses may be required as part of a core program. Emphases within the functional area will be provided by specific courses and other experiences agreed upon by the student and his advisory committee.

PRELIMINARY EXAMINATIONS

When a student has passed the research-tools requirement and completed at least 36 hours beyond the master's degree or its equivalent, he may apply to the executive committee for advanced graduate study in education for permission to take the preliminary examination. The preliminary examination, which is written, will assess competencies in the general areas of psychological foundations, social and philosophical foundations, and research methodologies, and materials from the student's functional area. Preliminary examinations are conducted each year on the third Friday and Saturday in November, the first Friday and Saturday in March, and the third Friday and Saturday in July. Four four-hour examinations will be given each student. All must be successfully passed within three successive test periods. Three failures on any one of the examinations shall be cause for elimination of the student from the program.

DISSERTATION

The dissertation committee consists of the sponsor and at least three others appointed by the dean of the Graduate School on the recommendation of the area's co-ordinator through the executive officer. At least one member of the committee must be from a functional area other than that of the student and at least one must be from a related area other than professional education.

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

ADMINISTRATION AND SUPERVISION

Graduate programs in this department lead to the Master of Science in Education degree and the Sixth-Year Specialist's Certificate. The internship in educational administration is offered. Concentrations in support of the Ph.D. degree in education are offered.

At the master's level, concentrations are offered in educational administration and in instructional supervision. Graduate courses taken in the department must follow the pattern of prerequisites for admission to courses.

Admission to master's degree work in the department must be approved by the department's admissions committee. The department's admissions requirements are available upon request to the chairman. Degree candidates' programs of courses must be approved by the appropriate adviser in the department. Transfer from unclassified status to the department will conform to Graduate School and department requirements for such transfer.

The specialist's program requires 45 hours of graduate study beyond the master's degree. The program includes a practicum, a field study, a minimum requirement in foundations, and a concentration upon an area of specialization. The department's admission requirements and program specifications are available upon request to the chairman. The areas of specialization, the practicum, and the field study are individually planned in terms of the candidate's professional goals. Programs are designed in harmony with standards of accreditation in professional education.

The internship is offered in support of graduate degree programs. Internship requirements and program specifications are available upon request to the chairman.

The department provides advanced courses and doctoral committee members for students pursuing the Ph.D. degree in education. Admission requirements and program specifications are available upon request.

EDUCATIONAL ADMINISTRATION

The program for the M.S. in Ed. degree, includes the following sequence of courses: Guidance 422b, Educational Administration and Supervision 500, 460, 424, and 535 or Elementary Education 557 or Secondary Education 564, and Educational Administration and Supervision 456. Eight hours of additional required courses may be elected from 420, 533, and 534. A comprehensive oral examination is required.

The Graduate School stresses the advantage of an academic field minor for the educational administration student. The department recommends an academic field minor for all candidates whose undergraduate degrees lack concentration in academic major and minor fields in the junior and senior levels of undergraduate courses. Students with strong undergraduate academic majors and minors will be encouraged to pursue a foundations minor. Students with strong academic and foundations backgrounds may be encouraged to pursue a minor in guidance. Since the master's degree requires 24 hours of credit at the 500 level, students should exercise caution in electing 400-level courses.

The required courses are listed above in the sequence which must be followed by majors. Exceptions must be approved by the chairman. Any unclassified student who hopes to be admitted to this department should request advisement from the department's adviser before enrolling in his first course as an unclassified graduate student.

INSTRUCTIONAL SUPERVISION

The program for the M.S. in Ed. degree includes the following sequence of courses: Guidance 422b, Educational Administration and Supervision 500, 460, Elementary Education 561, or Secondary Education 550, Educational Administration and Supervision 424, 456, 556, and 575b. A comprehensive oral examination is required. The regulations for the minor in instructional supervision parallel the regulations for the minor in educational administration.

THE SIXTH-YEAR SPECIALIST'S CERTIFICATE

Admission standards for the Sixth-Year Specialist's Certificate program parallel the admission requirements for the Ph.D. degree program, except that students admitted on a provisional basis must have the consent of the dean of the Graduate School. All candidates must have the master's degree or its equivalent. Prerequisites to this program include the required courses for the Master of Science in Education degree in educational administration which were omitted in the student's master's degree curriculum.

At least 16 hours in graduate courses will be taken in foundation fields of educational administration, at least 16 in the area of administrative specialization, at least 8 either in an internship or a practicum, and 5 in the field study.

The Sixth-Year Specialist's Certificate program will be designed by the candidate and his adviser subject to the approval of the advisory committee of the department. Specific courses and the sequence in which they are to be taken must be approved by the advisory committee.

The department requires a comprehensive written examination as the final step toward the sixth-year program.

ELEMENTARY EDUCATION

Graduate programs in the Department of Elementary Education lead to the Master of Science in Education degree, and the specialist's certificate, and contribute to the Ph.D. degree program in education.

The graduate majors in elementary education and in early childhood education for the Master of Science in Education degree consists of a total of 48 hours. Programs have been developed for prospective elementary principals and elementary supervisors. Programs have also been developed for teachers who wish to specialize somewhat in one of the following areas: language arts, reading, social studies, elementary mathematics, elementary science.

Each of the above programs includes certain required courses, guided electives, and related courses in liberal arts. All programs must be planned with and approved by the graduate advisers in elementary education or in early childhood education. Specific course requirements for a given program may be obtained upon request from the Department of Elementary Education.

Students in early-childhood education who have not had psychology

or Guidance 412, Sociology 427, Health Education 312, or the equivalent of one of these, are required to take four hours in psychology or guidance. Educational Administration and Supervision 554 or 555 or the equivalent is required.

RULES RELATING TO THE MASTER'S DEGREE

1. In lieu of a thesis, all students are required to take Guidance 422 or its equivalent and Educational Administration and Supervision 500.
2. A total of from eight to twelve hours should be selected from departments outside of the College of Education.
3. At least twenty-four hours must be on the 500 level.
4. Those who have undergraduate degrees in other fields, regardless of teaching experience, are required to complete, without graduate credit, at least four hours of elementary methods (314 or equivalent) and eight hours of elementary student teaching. The teaching must be done in residence at a university or college approved by the American Association of Colleges of Teacher Education.
5. Any student taking graduate courses without first being approved by his adviser risks having work not accepted for the degree.

The specialist's certificate follows a sixth-year program requiring 45 quarter hours of work. The program is individually planned to meet the student's professional objectives. Part of the program includes a project which shows the ability to conduct individual investigation.

The Doctor of Philosophy degree in education with a major in curriculum and instruction with emphasis in elementary education requires 96 hours beyond the master's degree. The applicant is approved only after passing the qualifying examination of the College of Education. The tools of research required by the department include one foreign language and statistics. Required also are completion of the preliminary examinations of the College of Education and the dissertation. The program is individually planned to meet the professional needs of the student. Opportunities are available for a strong subject matter minor if one is interested, for instance in a special subject matter field in the elementary school. Write to the chairman of the Department of Elementary Education for detailed requirements.

ENGLISH

Graduate courses in English may be taken for a major or minor in the Master of Arts program, for a major in the Master of Arts in English as a Foreign Language program, for the subject-matter major in the Master of Science in Education program, and for the Doctor of Philosophy degree. Inquiries about admission to graduate study in English should be sent to the Director of Graduate Studies in English, Department of English, Southern Illinois University, Carbondale, Illinois 62903.

For the M.A. degree in English, the student must satisfy the following requirements:

1. Complete at least 48 hours of satisfactory graduate work.

2. Take English 500 in the first term it is available to him.
3. Fulfill the linguistics requirement by taking English 400, 403, or 501.
4. Submit to the Director a clean copy of that research paper which best represents his abilities and accomplishments.
5. Pass the Master's Comprehensive Examination on the major texts of English and American literature.

For the M.A. degree in English as a foreign language, the student must satisfy the following requirements:

1. Take 28 hours of linguistics: English 400, 405a, 405b, 504, 505; Anthropology 401, 413.
2. Take 20 additional hours including English 488, 569; Guidance 422.
3. Pass a written comprehensive examination.
4. Submit to the chairman of the EFL program a paper which may take the form of instructional materials for teaching English as a foreign language.

For the Ph.D. degree in English, the student must satisfy the following requirements:

1. Complete at least 48 hours of satisfactory course work beyond the master's degree, or its equivalent.
2. Present evidence of competence in two foreign languages, normally French and German.
3. Pass preliminary examinations in English and American literature.
4. Submit a satisfactory dissertation.
5. Pass the final oral examination.

FOREIGN LANGUAGES

For the Master of Arts and Master of Science in Education degrees, majors and minors are offered in French, German, and Spanish. A minor may be taken in Russian.

Students who wish eventually to qualify for graduate work leading to the Doctor of Philosophy degree are required to write a master's thesis. Those who substitute courses (6 hours) for the master's thesis (on the recommendation of the graduate committee of the department subject to the approval of the dean of the Graduate School) must take a written (in addition to an oral) examination in the literature of their speciality. For all candidates for the Master of Arts degree, part of the oral examination will be conducted in the language of their speciality.

For the Master of Science in Education degree, Romance Philology 410 is required for students in French or Spanish. For the Master of Arts degree, Romance Philology 410 and either French or Spanish 515 are required. All romance philology courses may be counted toward either French or Spanish specializations.

Normally the bachelor's degree and a minimum of 27 hours in courses on the junior-senior level, or the equivalent, constitute the prerequisite for registration in graduate courses. However, students who do not meet this requirement may register for specific graduate courses

with the consent of the instructor and the authorization of either the chairman of the department or the chairman of the graduate committee of the department.

FORESTRY

The Department of Forestry offers major work for the Master of Science degree. Some work in other departments is recommended, the amount varying with the individual student's objectives.

In forestry research or teaching, graduate work is essential. It also leads to a higher grade classification than that of the bachelor's graduate on entrance into federal employment.

Forestry courses are available to students in the general conservation field.

GEOGRAPHY

The Department of Geography offers programs leading to the Master of Arts, Master of Science, Master of Science in Education, and Doctor of Philosophy degrees.

Although the relatively large staff allows a wide range of graduate courses, overlapping and interrelated interests of staff members enable particularly strong programs at both the master's and Ph.D. levels in several fields. Most important of these programs at present are in urban geography, industrial and transport geography; planning; cultural geography; climatology; the geography of land and water resources; and the geography of Anglo-America.

Students planning to minor in geography should consult with the department chairman to block out an acceptable program.

MASTER'S DEGREES

An entering graduate student need not have an undergraduate major in geography, but he should have had at least one course in each of its major aspects: physical, economic, cultural, and regional. Each entering graduate student is required to take an entrance examination, covering these divisions of geography, which is regarded as a diagnostic test expected to provide a measure of the student's background and to point up strengths and weaknesses that will be considered in planning his graduate program. Students with deficiencies will be asked to make them up by taking undergraduate courses or special readings courses.

A thesis is required of all master's degree candidates who major in geography.

For either the Master of Arts or Master of Science in Education degree, a student must give evidence of a reading competence in one modern foreign language, preferably French, German, or Russian. This can be accomplished either by successful completion of a year of college-level language courses or by passing a reading examination. For the Master of Science degree, evidence of competence in quantitative techniques is required instead of the language.

Course work centers around a basic core of courses dealing with geographic literature and thought, and the essential techniques used by geographers—field methods, library and writing techniques, and cartographic and quantitative representation. This core, including 410, 500, 501, and 515, totals 15 hours. The remainder of the graduate student's program is tailored to his interests within the resources of the department and other co-operating departments.

Candidates for the Master of Arts or Master of Science degree may or may not present a minor. Candidates for the Master of Science in Education degree must work out a program acceptable to the College of Education. For any graduate degree, students without a minor may receive credit toward their degrees in geography for courses in other departments approved by their advisers.

Within the regular geography program, students interested in planning are able to take advantage of a specialty in planning, developed in co-operation with the departments of government, economics, sociology, and the Community Development Institute. Such students may take courses related to planning in co-operating departments and in special inter-departmental arrangements. Furthermore, an internship plan allows these students to spend a summer as employees of local governmental planning agencies.

The normal load is 12 hours per quarter. Although the 48 hours required for graduation can be accomplished in four quarters, the department suggests that students think of six quarters as the time normally required to complete the master's degree. This longer time allows the student to complete a richer program and to spend adequate time in writing the thesis.

Before formally beginning thesis work and not sooner than two quarters after entering the master's program, the student must take a comprehensive examination covering the general field of geography. Upon successful completion of this examination he may begin his thesis.

An oral defense of the thesis is the final requirement.

DOCTOR OF PHILOSOPHY DEGREE

In addition to the Ph.D. degree requirements of the Graduate School, the department expects a would-be doctoral student to have a master's degree or its equivalent and to be able to demonstrate competence in the field of geography. Incoming students take a diagnostic examination covering the following subjects: (1) basic geographic techniques, (2) physical geography with emphasis on landforms and climatology, (3) two of the following specialties within economic geography: agricultural geography, industrial geography, urban geography, and trade and transportation, and (4) two of the following phases of cultural geography: population geography, political geography, and historical geography. Deficiencies indicated by the examination are to be remedied as prescribed by the staff. A program of study will be worked out between the individual student and his adviser with the approval of the staff. This program will be reviewed each quarter.

Students should understand that completion of the minimum of 48 hours does not necessarily suffice for the completion of course work requirements. The true measure is professional competence.

After the student has completed all or nearly all of his formal course requirements he will be assigned an individual research problem devised by the staff. The student will be expected to do the research and prepare a professional report on the problem within a two-week period without staff guidance or assistance. Upon review of the report by the staff the student will undergo an oral examination by the staff on his field problem, report, and fields of specialization.

Upon successful completion of the field problem and examination and all other prerequisites, the student is admitted to formal candidacy for the doctorate. A dissertation topic and prospectus are then submitted, and, upon approval of the topic by the staff, a thesis advisory committee is selected.

A completed dissertation is approved by the thesis advisory committee and an examining committee appointed by the dean of the Graduate School. The student will make an oral defense of his thesis before the examining committee.

GEOLOGY

The Department of Geology offers programs leading to the Master of Arts and Master of Science degrees. Appropriate programs are given for a minor related to anthropology, geography, zoology, and soils. Preparation for teaching earth science at the high school level is undertaken in co-operation with the College of Education and other science departments.

The department co-operates with an All-University program to prepare students for work in the areas of conservation, recreation and outdoor education, and natural science; a major or minor in geology directed toward this end may be obtained.

The aim of the master's program is to give the student competence in the basic fields of geology stressing field mapping, petrology, paleontology, stratigraphy, geomorphology, and mineral deposits, including petroleum. Specialization is encouraged only after this proficiency is attained.

The master's candidate must give evidence of competence in the basic sciences through formal courses or proficiency examinations. Reading knowledge of a foreign language is required at least to the equivalent of one year of college-level study.

Before undertaking the thesis a general examination, written or oral, is given; the master's oral examination is then concerned primarily with defense of the thesis.

Southern Illinois and adjacent areas offer a wide range of geological conditions ideal for class and individual study and research. Staff members are engaged in continuing study of the region and encourage participation by qualified students. The Illinois Geological Survey actively supports the work in Illinois.

GOVERNMENT

Graduate courses in government may be taken as a major or minor leading to the Master of Arts degree, as a part of the social studies major toward the Master of Science in Education degree, and as a major leading to the Doctor of Philosophy degree. Graduate students are required to take 499.

A minor is available on the doctoral level in all areas where a major is available on the master's level. A student is to select his minor only with the approval of his doctoral advisory committee.

GUIDANCE

Majors in the areas of guidance and counseling for elementary and secondary school lead to the M.S. in Ed. degree or to the Specialist's Certificate. The master's degree program requires 60 hours. The master's degree in educational psychology is also available.

GUIDANCE AND COUNSELING FOR SECONDARY SCHOOLS, *M.S. in Ed.*

The secondary guidance program is a series of courses intended to convey the complexity of adolescent behavior, and to prepare guidance workers to assist adolescents with personal, academic, and vocational problems. Prerequisites are Guidance 305-4 and 422a-4. The first course should be 442-4, which may be taken concurrently with 422b-4 and 562a-4. Guidance 562b-4 and Psychology 440-4 should follow 562a; 422c-4 or Psychology 421-4 should follow 422b and should be followed by Psychology 547-2 and Guidance 537-4 (which should not precede but may be concurrent with Psychology 547). Guidance 575c-4 must follow 537-4 and must be taken for 2 hours in each of two separate quarters.

Guidance 541-4 and 543-4 need only to follow 442-4. 545j-4 should be the last course or in the last quarter of courses taken for the degree.

Psychology 440-4, 465-4, and Sociology 426-4 are defined as a behavioral science option. If these courses cannot be taken, due to scheduling problems, a suitable course substitute in the same area will be approved.

GUIDANCE AND COUNSELING FOR ELEMENTARY SCHOOLS, *M.S. in Ed.*

This program is intended to train workers to assist parents and teachers with problems their children present.

Prerequisites are Guidance 305-4 and 422a-4. The first course should be 422a-4, which may be taken concurrently with 422b-4 and 562a-4. Psychology 440-4 and Special Education 412-4 should follow 562a; 422c or Psychology 421-4 should follow 422b and should be followed by 537-4 and 525-4 (which should not precede but may be concurrent with 537). Guidance 575b-4 must follow 537 and must be taken for 2 hours in each of two separate quarters. 536a-4 should follow 422c-4 or Psychology 421-4. 526-4 must follow 525-4. 541-4 and 543-4 need only to follow 442. 545j-4 should be the last course or in the last quarter of courses taken for the degree.

EDUCATIONAL PSYCHOLOGY, *M.S. in Ed.*

The objectives of this research-oriented program are to produce school research workers and to prepare people for subsequent work leading to the Ph.D. degree.

Prerequisites are the following courses, or their equivalents: Psychology 201, 211 or 420, 301 or 212 or 303, 432 or Guidance 412, Guidance 305 & 422-8.

A typical program might include the following courses in the order listed: Psychology 401, Guidance 422c, 511, Psychology 402, Guidance 520a, Educational Administration and Supervision 554, 4 hours for a thesis, Psychology 403, Guidance 515, plus three courses selected from Psychology 404, 406, 408, 420, 440, 451, Guidance 442, 520b, 535, 536, 537, 562-4, 4 to 8 hours of thesis, Educational Administration and Supervision 460 or Elementary Education 461 or Secondary Education 550, Educational Administration and Supervision 456.

CERTIFICATE OF SPECIALIST

The objective of this individually advised program is to extend competencies gained at the master's degree level. Normally 48 hours of coursework beyond the M.S. in Ed. degree in guidance shall be outlined for each student at the beginning of his program. As many as 9 hours may be earned in a field study if this is deemed advisable.

Recommended courses are Guidance 538, 539, 525, 526, 520-8, 596, 536-8, a practicum, and 16 hours of electives outside of guidance.

HEALTH EDUCATION

Master of Science in Education degree programs are offered in health education. The candidate may select from three areas of concentration: school health education, community health education, and safety education. In school health and safety education, two programs may be followed: (1) a minimum of 24 hours in health education, a minimum of 16 hours in a minor field, and 8 hours, with departmental approval, from other graduate courses in the University, (2) a maximum of 40 hours in health education and 8 hours from offerings in the field of education having departmental approval.

The program in community health education extends over four quarters of study with 60 quarter hours required for the degree. Required courses for the degree in community health are 488, 489, 500, 511, 533-12, 590, Food and Nutrition 404, Radio-Television 367, and Journalism 393.

Qualified candidates wishing to pursue a program leading to the Ph.D. degree in education with some work in health education will receive individual guidance from the department.

HIGHER EDUCATION

The Department of Higher Education offers programs leading to the Master of Science in Education degree and courses contributing to the Ph.D. degree in education.

The general goal of the department is a program: (1) to interest and instruct college graduates in the college teaching profession and its problems, (2) to interest and instruct college graduates in the field of college administration, (3) to interest and instruct college graduates in the field of college student personnel work, (4) to analyze and call attention to historical and current problems, issues, and opportunities in higher education.

The program in college student personnel work is a two-year course of study with a balance of theory and practice. Graduates receive a Master of Science in Education degree (72 quarter hours) plus a full academic year of experience in student personnel work with both women and men. The student plans his experience, in co-operation with his adviser, within the following framework: (1) courses in the major field including theory and supervised experiences, (2) courses in the foundation fields of higher education including theory, philosophy, problems, curriculum, finance, and administration and of human behavior including personality theory, psychopathology, learning theory, group dynamics, counseling theory, and psychological measurement, and (3) courses in elective areas of professional education or the traditional academic disciplines to strengthen the student's college teaching or other professional needs.

Admission to the program is by Selection Committee. Qualifications for admission include a bachelor's degree, a *B* average or better in undergraduate study, and personal qualities to live with students as an adviser and counselor.

Room, board, and tuition are offered for service as a residence hall fellow. Fellowship funds of \$80 per month are available for students accepted with a *B* average or above. Especially for married students, a limited number of graduate assistantships at \$180 per month and tuition are available through the Student Affairs Office.

For further information on the program in college student personnel, address inquiries to Co-ordinator, College Student Personnel Graduate Studies Program, Department of Higher Education.

Work contributing to the Ph.D. degree program in education is offered by the Department of Higher Education in the following specialized areas: general administration, business affairs administration, and student personnel administration.

HISTORY

History may be chosen as a major for the Master of Arts degree and as part of a social studies major for the Master of Science in Education degree. In either case a minimum of 32 quarter hours (of the 48 hours required for the degree) of appropriate history credit is required. At least 16 of the required 32 hours must be taken in courses on the 500 level, the remainder on the 400 level. Candidates for the Master of Arts degree are required to present a thesis (5 to 9 quarter hours) and must pass a reading examination given by the Department of Foreign Languages in a modern foreign language. They must also pass an oral ex-

amination in history after the thesis has been accepted. The thesis is optional for Master of Science in Education degree candidates, and there is no language requirement for that degree. All candidates for either degree should consult the department chairman or his representative before enrolling for courses. When a student has been assigned to a department member to write his thesis, that person becomes his adviser. The department believes that programs should be planned in the light of the student's previous studies, and it discourages undue specialization.

HOME ECONOMICS

The Master of Science and Master of Science in Education degrees with a major in home economics are available with specialization in clothing and textiles (including interior design), food and nutrition, family economics, home management and equipment, family relations, child development, and home economics education. Work toward the Ph.D. degree is available in home economics. The Letitia Walsh award-loan of \$5,000 is available for Ph.D. candidates in home economics.

Prerequisites for Admission to Advanced Graduate Study

1. Admission to the Graduate School. (Refer to Chapter 1.)
2. Completion of a curriculum in home economics or in a related field such as biological, physical, and social sciences, art, business, and/or communications. When necessary, deficiencies may be made up concurrently.
3. Satisfactory scores on the Graduate Record Examination are required.
4. Unconditional admission is granted to students whose undergraduate averages are equivalent to 3.5 and above and whose scholastic record in the chosen field of concentration indicates ability to pursue advanced study. Conditional admission may be granted where the average is above 3.2, but below 3.5.
5. Demonstrated ability to write effectively as indicated by scores in English composition or by written composition under the supervision of a departmental representative. In the case of foreign students an official statement showing sufficient proficiency in English is required.
6. The student attains full graduate standing in home economics when he has met the above requirements and has made satisfactory scores on the Ohio State Psychological Examination.

Prerequisites for Admission to Advanced Graduate Study

1. Prerequisites 1, 2, and 5 as listed above.
2. Recommendations from three or four former teachers or supervisors whose names the student has submitted.
3. Satisfactory scores on the Graduate Record Examination must accompany the application for admission.
4. Unconditional admission is granted to a student whose undergraduate average is 4.50 or above and whose scholastic record in the chosen field of concentration indicates ability to pursue advanced study. Con-

ditional admission may be granted where the average is not below 4.25.

INDUSTRIAL EDUCATION

Graduate students may elect industrial education as a major or minor for the Master of Science or Master of Science in Education degree. Advanced study beyond the master's degree is also provided in connection with the minor of a Ph.D. degree, the major of which is in another field.

INSTRUCTIONAL MATERIALS

Graduate courses in instructional materials may be taken for a major toward the Master of Science in Education degree. They may be taken also as a minor in library service or as a minor in audio-visual education toward the Master of Science in Education degree.

The graduate major in instructional materials, toward a Master of Science in Education degree, involves professional training in both audio-visual education and school library service. It meets the state and national certification standards for full-time school librarians and the standards recommended by the Department of Audio-Visual Instruction of the National Education Association. In Illinois, every school librarian is also required to have a teaching certificate.

Fifty-two hours are required for the major. No minor is required. At least 26 hours must be in courses numbered 500 or above. The following courses are required: 403, 405, 406, 417, 420, 445, 510, 514, 546, 554, 599, and 12 hours from 440, 450, 457, 458, 470, 530, 547, 548, 549, 560, and 576.

A minor in instructional materials toward the Ph.D. degree can be obtained through a proper choice of electives.

The minor in school library service is offered for students taking a major in another area. This minor, consisting of a minimum of 15 hours, is intended primarily for teachers who wish to obtain an appreciation of literature for children and adolescents. It is not intended for the preparation of professional school librarians. The following courses are required: 405, 406, 514, and at least 3 hours from 420, 510, 530, and 576.

The minor in audio-visual education is also offered for students taking a major in another area. This minor is intended primarily to prepare audio-visual directors and co-ordinators. It meets the certification recommendations of the state and national audio-visual organizations. The following courses are required: 417, 546, 548, and at least 3 hours from 440, 445, 457, 458, 547, 549, 560, and 576.

For further information on planning major and minor programs, work experiences, job opportunities, or other related matters, consult the Chairman, Department of Instructional Materials.

INTER-AMERICAN STUDIES

Course work in the inter-American studies program is offered by the departments of Anthropology, Economics, Foreign Languages, Geography, Government, and History.

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 director of the Latin American Institute and the supervisory 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 an area of concentration of at least thirty hours of courses acceptable for graduate credit, in one of the above listed departments.
2. The completion of a minimum of eighteen hours of related studies approved by the student's supervisory committee which will meet the requirement for a minor in the Latin American Institute. A maximum of three areas is permitted in the minor field of concentration.
3. The completion of a satisfactory thesis on a Latin American topic in the area of concentration for which five to nine hours of credit are given.

A minor in inter-American studies for those students with a major in a department outside of the institute will consist of a minimum of eighteen hours to be taken in two of the participating departments. Specific course programs will be worked out by the director of the institute, in consultation with the chairmen of the departments involved.

In every case the student's final program must be approved by the graduate supervisory committee, acting under policies established by the Latin American Institute and the Graduate School.

JOURNALISM

Courses in journalism leading to the Master of Arts, Master of Science, and Doctor of Philosophy degrees are offered by the Department of Journalism. Candidates for a master's degree must complete 48 hours of graduate work (half in professional journalism courses, the remainder in courses in the liberal arts) including a thesis demonstrating a capacity for investigation and independent thought.

Each doctoral program is designed to fit the needs of the individual while satisfying requirements of the Department of Journalism and the Graduate School. Among minimum requirements are 96 hours of graduate-level courses beyond the bachelor's degree, to include a minimum of 36 hours of advanced journalism courses and 24 hours each in two other approved related fields. Doctoral students will be examined over their three academic areas of concentration, write a dissertation, and meet all requirements of the Graduate School.

MATHEMATICS

Graduate work in mathematics may be taken as a major or minor leading to the Master of Arts, Master of Science, or Master of Science in Education degree. For a major, the Master of Arts degree requires a thesis, and the Master of Science degree requires a special research paper. For both of these degrees there must be a *B* average in the major courses as well as a *B* average in all graduate work, and the candidate must demonstrate a reading knowledge of French, German, or Russian by passing a special examination given by the Department of Foreign Languages. Both written and oral comprehensive examinations are required. The following course requirements for the M.A. or M.S. degree must be satisfied: 501-6, 520-8, 556-6, 433, and 530 or 501c.

Current and prospective high school teachers may become candidates for the Master of Science in Education degree. A special paper in mathematics, together with certain specifications in both education and mathematics courses, is required, but there is no foreign language requirement. For further information, consult the Department of Mathematics.

MICROBIOLOGY

Graduate courses in microbiology may be taken as a major or minor leading to the Master of Arts and Master of Science degrees, or as a part of a biological sciences program leading to the Master of Arts, Master of Science, and Master of Science in Education degrees.

The Doctor of Philosophy degree in microbiology will be awarded to a candidate in recognition of achievement in independent research and in advanced studies. His original contribution to knowledge, evidenced in the dissertation, together with a superior comprehensive scholarship record and satisfactory completion of prescribed examinations are the criteria for the degree. Emphasis will be placed on his critical evaluation of, and familiarity, with the existent developments in microbiology and related areas of study.

The Department of Microbiology and the Biological Research Laboratory offer facilities for research in microbial genetics, cytology, radiation biology, physiology, and biochemistry of microorganisms, medical microbiology, immunology, and virology. In addition to the library facilities, reprint collections covering many topics in microbiology are available for student use.

To be eligible for the Ph.D. degree, the student must satisfy the following requirements. (1) He must complete at least 144 hours of graduate work and research. Credit for research may not exceed 60 out of the 144 hours. (2) He must demonstrate his proficiency in statistics and his ability to read, with reasonable facility, scientific literature in two modern languages. (3) He must pass the qualifying examination and a final oral examination. (4) He must submit an approved dissertation based on his research.

A minor may be elected as part of a doctoral program in microbiology, subject to approval of the department, from courses in any program which constitute a major for the master's degree. A minor in microbiology for the doctorate in another biological science consists of general microbiology and 20 hours selected from courses offered and approved by the department.

MUSIC

Candidates for the M.M. or M.M.E. degree or the Ph.D. degree in education who wish to choose applied music courses as electives will take the 400-series course in their major instrument or voice for 2 hours per quarter. Applied music majors in the M.M. curriculum will take the 500-series course in their major instrument or voice for 4 hours per quarter. These are artist-level courses, and admission to them and to the degree program must be obtained from the chairman of the department after passing a jury placement examination.

MASTER OF MUSIC DEGREE

Requirements include 18 hours in a major area (history-literature, theory-composition, or applied music), Music 501-3, 502-9, 599-3 to 9 (thesis), and electives in music to make a total of 48 hours.

In addition, each applied music candidate must present a recital without additional credit and prepare a paper related to the literature performed on the recital. Maximum credit allowed the applied music candidate for the thesis is 3 hours.

MASTER OF MUSIC EDUCATION DEGREE

A minimum of 12 hours must be in music education courses; a maximum of 8 hours may be elected in professional education courses in consultation with the adviser. Other requirements include 18 hours in a major area, Music 501-3, 502-9, 503-3 (by advisement), 599-9 (thesis, or 8 hours of course work as approved by the student's advisory committee), and electives in music to make a total of 48 hours. At least two quarters of ensemble experience are required.

DOCTOR OF PHILOSOPHY DEGREE

This doctoral program, in education, consists basically of 96 hours, including 30 in general education (curriculum and instruction), 30 in music education and/or general music courses, and 36 in dissertation. Specific courses depend upon individual needs and will be determined through consultations with the student's program committee. The dissertation may be in the field of music education but should demonstrate general educational research techniques. To be admitted to this program, a candidate must have earned a 4.5 grade at the master's level in music (5.0 corresponds to a grade of A) and must score 50% or above in the Miller Analogy test. Application for admittance to this program may be made through either the College of Education or the Department of Music.

In both the 400 and the 500 series of courses the emphasis is placed upon the literature of the instrument or voice with the assumption that the learning of techniques will have largely been mastered at the undergraduate level.

For specific repertoire requirements in each course see the Applied Music Appendix of the Department of Music.

PHILOSOPHY

The Department of Philosophy offers graduate work leading to the Master of Arts and Doctor of Philosophy degrees. Graduate courses in philosophy may be used also as a minor in programs leading to the Master of Arts or Master of Science in Education degree. 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 60-hour double major.

The department expects an applicant for admission to its graduate program to have had at least 24 hours' work in philosophy or closely related theoretical subjects, including at least one quarter 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 Department of Philosophy requires the candidate for a master's degree to present a thesis, for which 9 hours of credit are allowed. He must pass two examinations: a written examination covering the nature and proffered solutions of 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 (indicated by successful completion of a year's work in the language in college or by special examination) is required of each candidate. The student who expects later to enroll in the Doctor of Philosophy degree program in philosophy is urged to take the language examination required in that program.

Applicants for the Doctor of Philosophy degree in philosophy should submit with their application forms scores for the Graduate Record Examination. The department may, where other evidence of competence seems so to warrant, accept a candidate upon the condition that he later submit acceptable scores.

At the time of his acceptance in the 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 36 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 demonstrated reading proficiency in two foreign languages.

After he has passed his language examinations and the preliminary examination and has completed 48 hours of work beyond the master's degree, the student is admitted to 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 15 of the scholastic year preceding that for which the application is made. An effort is made to give every candidate for the doctor's degree supervised experience in teaching elementary work in the field of philosophy.

PHYSICAL EDUCATION

Graduate courses in physical education may be taken as a major or minor toward the Master of Science in Education degree or the Doctor of Philosophy degree.

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 an undergraduate minor (preferably a major) in physical education;
3. Presentation of an overall undergraduate average of 3.5 or better;
4. Presentation of at least one undergraduate course in anatomy, physiology, or kinesiology and at least one in educational psychology or psychology of the particular field of the student's specialty, (such as adolescent psychology); and
5. Possession of the ability to teach and demonstrate an acceptable variety of physical education activity skills and techniques.

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

Physical education courses required of all majors and minors are 500, 501, 502, 503, and 504. Certain other courses may be required to remedy weakness in a student's background preparation.

Requests for transfer of credit from other institutions will be considered only before admittance into this program.

This program is made up of 20–32 hours of required courses in physical education, 0–12 hours of elective courses in physical education, and 16 hours either in a minor area or in several fields, with no attempt being made to achieve a minor in any one field.

Minor

Students majoring in a related area may minor in physical education. The minor consists of 16 hours, including 501, 502, and 503. For students who have not had adequate courses in tests and measurements and in principles of physical education, 400 and 406 are also required.

DOCTOR OF PHILOSOPHY DEGREE

One may pursue a program of study leading to a Ph.D. degree in education through any one of three functional areas: curriculum and instruction, educational psychology, or administration and social foundations. Within the functional areas specific emphases are available in physical education.

The departmental qualifications for admission to advanced graduate study are:

1. Fulfillment of the requirements of the Graduate School and the College of Education;
2. Presentation of professional course work equivalent to Southern Illinois University's undergraduate and master's programs in physical education; and
3. Achievement of a satisfactory score on the Graduate Record Examination advanced test in physical education.

A student may be permitted to start advanced graduate work while making up deficiencies.

Three years of full-time graduate study after obtaining a bachelor's degree or two years of full-time graduate study after a master's degree (or its equivalent) constitute the minimum requirement for the doctorate. The student and his adviser will determine a pattern of course work to equip the student in physical education and its allied fields, foundations of education, cultural courses outside the area of education, and for independent research.

The program of studies beyond the master's degree must include a minimum of 96 hours of approved graduate courses of which 60 hours must be in courses on the 500 level or above. Of these, 36 must be in Dissertation 600. Any dissertation credit beyond 36 hours may not be included as part of the 96-hour requirement. Additional work beyond the 96 hours may be required to insure professional competence and broad cultural knowledge.

Competence in two foreign languages, the selection of which shall be approved by his adviser, or in one foreign language and statistics, similarly approved, is required.

The procedure for beginning a program of study leading to a Ph.D. degree is as follows:

1. Submit an application for admission, with transcript or transcripts, to the Graduate School.
2. Submit transcripts to the Department of Physical Education.
3. Present acceptable professional recommendations to the Departments of Physical Education. If the transcripts and recommendations are acceptable, the departments will appoint an adviser for the student.
4. Initiate a meeting with the appointed adviser to work out a program of study.

PHYSICS

Graduate work in physics may be taken as a major or minor leading to the Master of Arts or Master of Science degree, or as part of a physical sciences program toward the Master of Science degree. Research is in progress in solid-state physics, in cosmic rays, in theoretical physics, and in nuclear spectroscopy. Research equipment now available includes two multichannel analyzers, various sodium iodide crystals (including one 8 inches in diameter), a Beckman DK-2A spectrophotometer, several furnaces, and accessory electrical equipment for work in solid-state physics. An electron microscope and several IBM computers are available on the campus.

Each candidate for a master's degree in physics must take 501-15 and write a thesis in one of the fields of research mentioned above. The remaining 24 hours of required graduate credit will be obtained by completing certain of the following electives, at least 6 hours of which must be in physics: 404, 405, 413, 414, 450, 511, 531; Mathematics 452, 480, 501, and 555.

Required courses for the physical sciences program are 405, 413, and 420 which have as prerequisites 301 and 305.

PHYSIOLOGY

Graduate courses in physiology may be taken as a major toward the Master of Arts, Master of Science, Master of Science in Education, and Doctor of Philosophy degrees, and as a minor toward the Master of Arts and Master of Science degrees. Graduate courses in physiology also may contribute to a major in biological sciences toward the M.S. degree, and to one in biological sciences in education toward the M.S. in Ed. degree.

The graduate prerequisites at the master's level include the equivalent of an undergraduate major in biological sciences plus inorganic, analytic, and organic chemistry and a minimum of one full year each of physics and mathematics.

For a master's degree in physiology, a student must ordinarily work two years and present an acceptable thesis based upon original investigation. Equivalent work completed elsewhere can be accepted in part.

Courses should be elected from other departments such that a major of about 32 hours and a minor of about 16 hours are attained. Because of the importance of biochemical and biophysical knowledge to physi-

ology, students are urged to select their minors in those areas. Other biological sciences are also acceptable, after consultation with the chairman of the department.

Training is provided in cellular, comparative, and mammalian physiology. Because of this trichotomy, entering students are urged first to obtain a basic knowledge of the whole field and then to specialize in one of the three areas after being advised by their major professor in conjunction with the chairman of the department.

Students entering the doctoral program should ordinarily have at least the same prerequisites as those entering a master's program, except that courses in calculus and physical chemistry are highly recommended. Students with prior majors in chemistry or physics, but little training in biological sciences, are equally eligible for admission to the program.

Three years of full-time graduate study after obtaining the bachelor's degree, or two years after the master's degree (or its equivalent) constitute the minimum requirements for the doctorate.

A competence in one foreign language which has been selected by the student and his adviser plus Mathematics 410-12 (statistical analysis) are necessary for admission to doctoral candidacy. In addition, if they or their equivalents have not been previously taken, Chemistry 451-11 (biochemistry), and 460 (theoretical chemistry) or else 461-12 (physical chemistry) are also necessary before admission to candidacy.

The total program should be formulated upon entrance in consultation with the adviser.

PLANT INDUSTRIES

The Master of Science degree can be earned in the Department of Plant Industries in the general fields of soils, field crops, and horticulture. Graduate courses in plant industries may also be taken for a M.S. degree minor.

It is customary to require supporting courses in botany, microbiology, chemistry, statistics, and other areas deemed essential for an intelligent approach to a problem in the student's chosen field. 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 olericulture or pomology; in soils the problem may relate to fertility, soil physics, soil microbiology, or soil and water conservation; in field crops the problem may be directed toward crop production and management, weeds and pest control, and other supplementary areas. Often a problem can combine study in two of these more restricted divisions.

Important research facilities are available in the department through three co-operative experimental farms. The Illinois Horticulture Experiment Station and the Agronomy Research Center are operated co-operatively with the University of Illinois; the Small Fruits Research Station is operated co-operatively with the United States Department of Agriculture, Agriculture Research, Crops Research Division.

The purpose of the Horticulture Experiment Station is to provide facilities for research and demonstration with fruit, vegetable, and ornamental crops. The station's land area includes a twenty-eight-acre south unit, a fifty-five-acre west unit, and approximately twenty-five acres for vegetable research. The station headquarters, located on the west unit, includes a combination research-laboratory storage building, a machinery shed, a sash-type greenhouse, a plastic greenhouse, and a propagation cellar. A pond of one and one-half acres provides water for spraying and irrigating. Specific projects undertaken include the testing, breeding, and developing of fruit, vegetable, and ornamental varieties adapted to southern Illinois; studying fundamental problems related to cultural methods and to rootstock-variety combinations; and providing demonstration areas for students and growers.

The purpose of the Agronomy Research Center is to provide facilities for soils and crops research and demonstrations. The station includes approximately one hundred acres of land at two locations. Projects are conducted on a co-operative basis by personnel of the University of Illinois and Southern Illinois University, or independently by personnel of either institution. Studies are conducted to develop acceptable varieties of field and forage crops, emphasizing their adaptability to southern Illinois; and to seek answers to fundamental problems in the management of soils and the culture of crops. Demonstrations are developed for observation by students and other interested persons.

The purpose of the Small Fruits Research Station is to provide facilities for research investigations on breeding, production, and disease control of strawberries, blueberries, brambles, and other small fruits. The station includes fifty acres of suitable land supplemented by an irrigation pond and a station service center with a shop, machine storage, and field laboratory located on immediately adjacent acreage. The pond has a capacity of approximately fifteen million gallons. The Federal Government is presently constructing several greenhouses with headhouses in connection with this station.

The purpose of the Southwestern Farms Experiment Station is similar to that of the Agronomy Research Center with respect to soils and demonstration but includes forestry, research and demonstration as well. There are approximately 183 acres in this farm, located south of Scott Air Base near Belleville, and the land is approximately evenly divided between soils and crops, research and demonstration in plant industries and similar use in forestry.

Because of the diversity of areas of interest in the Department of Plant Industries, no general curriculum is applicable for all graduate students. Each graduate student's background is studied carefully by a committee, chosen for his specific area of interest, and his approval for admission to study in the department is made upon the condition that weaknesses in his background be satisfied. When the student is on campus he is invited to attend the committee's discussion so that he understands fully why every requirement is made.

The Department of Plant Industries requires for approval to do graduate work that a student have not less than a 3.5 average in the last 50% of his work, which must include 20 hours in his major undergraduate field. The undergraduate major may be in any area, but the undergraduate area has much to do with the preparatory courses required by his advisory committee.

An oral examination over all graduate work and the submission of a thesis are required.

For additional information concerning programs and assistantships write to the Chairman, Department of Plant Industries, Carbondale.

PSYCHOLOGY

The Department of Psychology offers graduate work leading to the Master of Arts, Master of Science, and Doctor of Philosophy degrees. The primary emphasis is on doctoral training, for which the master's degree is a prerequisite.

Separate application forms for both the Department of Psychology and the Admission Office must be filled out. Both forms may be obtained from the department.

Doctoral programs are offered in general experimental psychology and in the professional areas of clinical, counseling, and industrial psychology. The general experimental program embraces the research areas of learning, motivation, sensation, perception, psychophysics, social, child, and personality.

In addition to approved programs of study, doctoral students in the clinical, counseling, and industrial areas must complete the equivalent of a full-time academic year of internship in an agency approved by the department. Doctoral students in general psychology have an equivalent period of experience in teaching or research.

Minor programs may be worked out in all areas in which specialization is offered, provided that the candidate presents suitable preparation for the level of work to be undertaken.

No student will be accepted for graduate work in the department without prior application to, and approval by, the departmental admissions committee as well as the University's Admissions Office. Departmental application forms and information concerning fellowships and assistantships may be obtained from the Chairman, Department of Psychology.

It is apparent that psychologists are faced with demands to deal with an ever-increasing range of problems, basic as well as applied. As a consequence, the goal of graduate study at Southern Illinois University 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. To accomplish this aim, a program composed of four integral parts has been developed: the core curriculum, specialization, research and practicum opportunities, and training assignments.

CORE CURRICULUM

The core curriculum is designed to give systematic work in both the theoretical and substantive material of general psychology (501-12 Pro-seminar in General Psychology), in quantitative methods (Mathematics 410-8 Statistical Analysis), and in research design (522 Research Design and Inference, 523 Research Seminar). This curriculum is considered basic to all areas of specialization and is required of all students in their first year of graduate training.

AREAS OF SPECIALIZATION

1. General Experimental Psychology

The general experimental program is planned for the student who wishes to have a broad academic course of advanced study in psychology. It is primarily intended for students working towards careers in teaching and research. While considerable flexibility is permitted so that the student may select courses from several areas, he is expected to concentrate in at least one area, e.g., learning, sensory processes, social, child, etc. Required courses: 409 History and Systems, 509 Instrumentation, and 524 Advanced Research Methods. In addition, the student is required to take research credit (591) during all but the first quarter of residence.

2. Clinical Psychology

The clinical program, approved by the Education and Training Board of the American Psychological Association, provides training such that the student may prepare for a career not only in clinical services, but also in research or teaching. While the student is expected to become competent in clinical skills, he is also encouraged to be able to evaluate critically the techniques which are currently available. To aid in this process and to foster a research orientation generally, each clinical major is required to take 595-1 Research Seminar during all but the first quarter of residence. Additional requirements are as follows: 530 Personality Theory and Dynamics, 593 Practicum in Clinical Psychology, 538 Group Therapy or 556 Clinical Treatment of the Child, 541-6 Psychodiagnostics I, 543-6, Psychodiagnostics II, 537 Counseling and Psychotherapy, and 598 Ethical and Professional Problems. In order to complete his major, the student is to elect four additional clinical courses congruent with his interests.

3. Counseling Psychology

The counseling program, approved by the Education and Training Board of the American Psychological Association, is designed to prepare the student for a variety of careers in counseling. There is some overlap with the clinical program, the extent being dependent, in part, on the particular interests of the student. Required courses: 530 Personality Theory and Dynamics, 421 Psychological Tests and Measurements, 536 Fundamentals of Counseling, 547 Assessment Procedures in Counseling, 593 Counseling Practicum, and 598 Ethical and Professional Problems. In

addition, the following electives are strongly recommended: part or all of the diagnostic sequence (541-6, 543-6), 538 Group Therapy, 431 Psychopathology, additional measurement courses, and work from other disciplines.

4. Industrial Psychology

The industrial program is designed to prepare students for a wide range of research activities in the industrial area. It includes 593 Industrial Practicum and other courses selected in conference with the adviser.

RESEARCH AND PRACTICUM

Because of our commitment to the importance of broadening the scientific base of psychology and to the development of skills in the application or teaching of psychological principles, a variety of research and practicum experience is considered an integral part of the student's training. Therefore, with the exception of the first quarter, the student is expected to participate in research or practicum each quarter of residence.

Research may be of the student's own design or may be in conjunction with various studies being conducted by staff members. Research competence in original individual research is required of all students.

TRAINING ASSIGNMENTS

As a vital part of our graduate training program, each student must be engaged in a training assignment each term. These assignments vary according to the needs and professional aspirations of the student. They are designed to supplement the formal course work by a variety of pre-professional activities such as assisting in research, teaching, etc., under staff supervision. The training assignment increases in responsibility as the student progresses. The amount of time required of the student varies from ten to twenty hours a week, depending upon his level of 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 degree.

RECREATION AND OUTDOOR EDUCATION

The M.S. in Ed. degree program in recreation and outdoor education is designed to meet the needs of (1) administrators and supervisors who wish to extend their professional competencies, (2) leaders and group workers already employed, especially those who seek to qualify for advancement, and (3) graduate students with undergraduate preparation in recreation or closely related fields who wish to prepare themselves for higher roles in recreation.

The program consists of a core curriculum of 20 hours selected from 450, 480, 510, 520, 530, 540. Educational Administration and Supervision 500 or an equivalent research course in an area of specialization, such as Sociology 587, is required.

A thesis is optional but is encouraged.

The program is divided into four areas of specialization, and there are 32 hours of required courses.

1. School Recreation and Outdoor Education. Required courses: 450, 480, 510, 520, 530, 540, 550, 560, Educational Administration and Supervision 539. It is recommended that a minor be selected from one of the following fields: educational administration, guidance, health education, physical education, psychology, sociology, or a related field.

2. Community Recreation. Required courses: 450, 480, 520, 530, 540, 550, 560, Geography 470, and Sociology 486. It is recommended that a minor be selected from one of the following fields: sociology, government, conservation, forestry, education, or community development.

3. Agency, Church, and Youth Organization Work. Required courses: 450, 520, 530, 540, 550, 560, Sociology 481, 489, 511. It is recommended that a minor be selected from one of the following fields: sociology, guidance, physical education, educational administration, or a related field.

4. Recreation for the Ill and Handicapped (Hospital and Institution). Required courses: 450, 480, 520, 530, 540, 550, 560, Special Education 413, 417, 574. It is recommended that a minor be selected from one of the following fields: special education, rehabilitation, sociology, guidance, health education, psychology, or instructional materials.

Practicum and Fieldwork

A unique feature of this program is the fact that each student is engaged in some form of actual experience at all times while he is in training.

During the first year, students are assigned to a different agency each quarter for pre-counseling experience. The purpose of this practicum is to acquaint the student with the organization and population in various rehabilitation agencies. Among the agencies used for this experience are a state mental hospital, an office of the Illinois Division of Vocational Rehabilitation, and a community mental hygiene clinic.

In the second year, the student engages in counseling practicum. This experience permits him to utilize his academic training, experience, and personal characteristics in direct work with clients.

At some time during his training, the student is required to spend one quarter in a full-time fieldwork experience in a rehabilitation agency. Currently this requirement may be fulfilled by training in a variety of agencies, including mental hospitals, state rehabilitation agencies, private rehabilitation centers, and camps for handicapped children and adults.

To supplement the recreation leadership curriculum, selected courses from related fields are recommended: Educational Administration and Supervision 500, 539, Government 467, Guidance 420, Sociology 407, 481, 486, 511, 587, Special Education 413, 417, 574.

The graduate minor in recreation consists of a minimum of sixteen hours from the recreation curriculum including 450 and 520.

A special course of study is designed for teachers and school administrators and church leaders who are primarily interested in the outdoor education program.

REHABILITATION

REHABILITATION COUNSELING

Two years of graduate work lead to either the Master of Arts or the Master of Science degree in rehabilitation counseling. A minimum of 72 hours is required for either degree.

Emphasis is given to practicum and field work experiences, and trainees receive various concurrent assignments in rehabilitation settings throughout their two-year program. In addition, each trainee will receive at least a three-month training assignment in the field.

The curriculum may be modified to fit the previous training, experience, and future occupational interests of the trainee. Early in the training program, a student is expected to plan with his adviser a meaningful pattern of electives to broaden his total education.

The following plan of study will serve as a guide for trainees in rehabilitation counseling. It can be modified for those interested in working with mentally retarded or for those who choose to serve as counselors in employment services, youth centers, and other settings.

First Year

Fall Quarter: Guidance 422b, Psychology 420, 440, 593m or Guidance 575d, Sociology 480

Winter Quarter: Guidance 537a or Psychology 536, Psychology 421, 593m or Guidance 575d, Sociology 481

Spring Quarter: Psychology 431, 547, 593n or Guidance 575a, Physiology 455, Special Education 573

Second Year

Fall Quarter: Psychology 593n or Guidance 575a, Special Education 571

Winter Quarter: Psychology 593n or Guidance 575a, Special Education 572

Spring Quarter: Guidance 481, 573, Psychology 593n or Guidance 575a, (optional)

Each candidate for the master's degree must conduct research culminating in a thesis. A final oral examination concludes his program.

Recommended Electives: learning, criminology, group dynamics, group psychotherapy, educational psychology, semantics, sensory processes, advanced social work, problems of the mentally retarded, sociology of aging, adolescent development, selection and placement, occupational information, economics of welfare, personality dynamics, general anthropology, speech correction, audiology, logic of the social sciences, social psychology, industrial relations, proseminar in psychology, community development, advanced statistics, industrial psychology, industrial sociology, government and labor, occupational analysis.

REHABILITATION ADMINISTRATION

The graduate program in rehabilitation administration is a 48-hour pro-

gram leading to the Master of Science degree. In general, the curriculum is a modification of the rehabilitation counseling program with less emphasis on counseling and testing. Departments offering courses which are utilized include guidance, physiology, psychology, sociology, and special education. Since the program is directed toward persons who have had considerable experience in the field, those courses listed in the rehabilitation counseling program will serve as a guide in preparing a final selection of courses for each student. In addition to the suggested core courses, students may be encouraged to take work in journalism, secretarial and business education, or speech. In every case, the following requirements apply:

1. The completion of 48 graduate hours. Academic work shall lead toward a general knowledge of medical and paramedical terminology and practice, fundamentals in counseling, community resources and organization, allied professions, occupational information, methodology, administration and supervision, and current concepts relating to rehabilitation theory and practice.
2. A thesis based upon research conducted by the student.
3. Three to six months of satisfactory, supervised experience in an approved rehabilitation setting may be required after the major portion of the course work has been completed. Satisfactory, supervised experience is defined as employment in a rehabilitation setting under the direction of a person of competent and certified experience.

In every case, the student's program will be based on previous experience and occupational goals. Programs will be approved by a graduate supervisory committee, acting under policies established by the Rehabilitation Institute and the Graduate School.

SECONDARY EDUCATION

One may work in this department toward the Master of Science in Education degree and toward the Specialist's Certificate. In addition, the department offers courses that are applicable to most of the functional areas of the Ph.D. degree program in education.

A program consisting of 48 hours of work for the master's degree will be arranged jointly by the Department of Secondary Education and the subject matter area department in which the student plans to teach. A student's undergraduate record, experience, and future plans will be taken into account in determining the number of courses in secondary education and subject matter to be taken. The same procedure will be followed for those who plan to pursue administrative or supervisory duties in the secondary school. Appropriate elective courses will be found for those individuals who plan to work in junior colleges or other post-high-school situations.

The work leading to the Specialist's Certificate is arranged in terms of the needs and future plans of the student. Many of the same procedures used in selecting courses at the master's degree level are also applied in this program.

It is assumed that the future plans of candidates seeking the Doctor of Philosophy degree and taking courses in the Department of Secondary Education will involve one or more of the following areas: administration of a secondary school, supervision of selected area(s) in a secondary school, or the teaching of courses in education in a teacher-education institution, directing the student teaching program and/or student teachers in a secondary education laboratory school.

SECRETARIAL AND BUSINESS EDUCATION

Graduate courses in business teacher education may be taken as a major or minor in the Department of Secretarial and Business Education leading to the Master of Science in Education degree. The program in business teacher education consists of a minimum of 48 hours of course work distributed as follows:

1. 18–24 hours in business teacher education courses;
2. 12–18 hours in other School of Business courses;
3. 12–18 hours in College of Education courses; and
4. 0–12 hours of approved electives.

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

The graduate 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 schools of Illinois. The dual purpose of the program is to provide advanced professional education in business teaching fields and to develop competence in utilizing research findings in the field. In keeping with the general requirements of the Graduate School, each student is required to write a research paper. 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.

SOCIOLOGY

Graduate courses in business teacher education also may be taken as a part of a graduate program in the Department of Secondary Education leading to the Master of Science in Education degree.

The Department of Sociology offers major and minor programs for the Master of Arts, Master of Science, and Doctor of Philosophy degrees. Admission to a program of study in sociology is granted by the dean of the Graduate School upon recommendation by the chairman of the department. Applicants for the Ph.D. degree should apply in writing to the chairman of the department, outlining their interests, objectives, and previous preparation. The applicant should also arrange with at least three persons (preferably former teachers) who are familiar with his qualifications to submit confidential letters of recommendation.

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1. The completion of 48 graduate hours. Academic work shall lead toward a general knowledge of medical and paramedical terminology and practice, fundamentals in counseling, community resources and organization, allied professions, occupational information, methodology, administration and supervision, and current concepts relating to rehabilitation theory and practice.
2. A thesis based upon research conducted by the student.
3. Three to six months of satisfactory, supervised experience in an approved rehabilitation setting may be required after the major portion of the course work has been completed. Satisfactory, supervised experience is defined as employment in a rehabilitation setting under the direction of a person of competent and certified experience.

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4. 0–12 hours of approved electives.

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

The graduate 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 schools of Illinois. The dual purpose of the program is to provide advanced professional education in business teaching fields and to develop competence in utilizing research findings in the field. In keeping with the general requirements of the Graduate School, each student is required to write a research paper. 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.

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Graduate courses in business teacher education also may be taken as a part of a graduate program in the Department of Secondary Education leading to the Master of Science in Education degree.

The Department of Sociology offers major and minor programs for the Master of Arts, Master of Science, and Doctor of Philosophy degrees. Admission to a program of study in sociology is granted by the dean of the Graduate School upon recommendation by the chairman of the department. Applicants for the Ph.D. degree should apply in writing to the chairman of the department, outlining their interests, objectives, and previous preparation. The applicant should also arrange with at least three persons (preferably former teachers) who are familiar with his qualifications to submit confidential letters of recommendation.

The Doctor of Philosophy degree with concentrations in rhetoric and public address, general speech, and theater is offered by the department. Emphasis at the doctoral level is on competency in the area of specialization and in research. The research program is designed to provide the student with a knowledge of the processes and techniques involved in advancing basic understandings in the various areas of speech: experimental, descriptive, historical, and critical.

The concentration in rhetoric and public address is designed to acquaint the student with the materials and methods in areas of history and criticism of speech. Specialized courses involve studies in British and American public address; classical, medieval, renaissance, and modern rhetorical theory; seminars in discussion, persuasion, and rhetoric and public address. The program of each student is designed to meet particular needs in terms of the background of previous work.

The concentration in problems in oral communication (general speech) involves a more general program. The student takes a minimum of 15 hours including a seminar from each of three of four areas: general speech and speech education, oral interpretation, rhetoric and public address, and theater. This program is designed to meet the needs of students interested in the various areas of the field of speech.

The concentration in theater is based upon specialized work in theory of drama and the theater, theater history, and dramatic production in which a minimum of 24 hours must be taken, and in more general courses from rhetoric and public address, interpretation, general speech, and speech education from which a minimum of 24 hours must be included.

In all Ph.D. degree programs enrollment in a minimum of 36 hours of research for the dissertation is required. The dissertation is an important part of the program and the ability to do distinguished research is an essential characteristic sought in the candidate.

SPEECH CORRECTION

The Department of Speech Correction has as its objective the training of qualified personnel to work with people impaired in either speech or hearing. Course work leads to certification as a speech therapist in public schools and rehabilitation centers by meeting certification requirements of the American Speech and Hearing Association.

Professional experiences for graduate students are provided in the following settings: the University's Co-operative Clinical Services Center; a summer residential camping program for organic speech problems, in co-operation with the University of Illinois Division of Services for Crippled Children; the V.A. Hospital in Marion; and the Anna State Hospital. Co-operative programing is maintained with other public and private agencies such as the Division of Vocational Rehabilitation, the Easter Seal Society, and the American Hearing Society. 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 area. Emphasis is on the interdisciplinary relationships with other professions throughout the training process.

The department maintains active research facilities which provide laboratories and specialized equipment to study muscle action in speech functions by electromyography, experimental audiology, palmar sweating as a physiological index of anxiety, and pathoanatomy and pathophysiology of cleft lip and cleft palate through roentgenocephalometrics and cinefluoroscopy.

Graduate courses in the Department of Speech Correction may be taken as a major leading to the Master of Arts, Master of Science in Education, Master of Science, and Doctor of Philosophy degrees. Requirements for the various degrees are determined through advisement commensurate with professional growth of the student.

TECHNOLOGY

Graduate programs leading to either a Master of Science or a Master of Science in Education degree are available to graduate students majoring in one of the areas of technology. There are opportunities for advanced study in technology with areas of concentration in appropriate fields such as applied science, engineering, engineering technology, industrial education, and industrial technology.

For additional information, consult the School of Technology.

THEATER

The Department of Theater offers courses leading to the Master of Arts, Master of Science, and Master of Science in Education degrees and contributing to the Doctor of Philosophy degree in speech with a theater specialization. Each candidate for the master's degree will do a thesis or its equivalent (creative work in play direction, costume or scene design, playwriting, etc.). The chairman appoints a director for each candidate's program. The Ph.D. program in speech with a concentration in theater is open to students holding a master's degree. Ph.D. candidates are required (1) to complete a minimum of 48 hours in theater and speech and (2) to complete a theater dissertation (although properly qualified candidates may offer a creative equivalent) under the supervision of a theater-speech advisory committee. Graduate courses in theater may also be taken as a minor leading to the Ph.D. degree in speech.

Candidates for the Ph.D. degree who have a special interest in dramatic literature may earn the degree by working in English and theater rather than in speech and theater.

An undergraduate major in theater is not essential for admission to candidacy for a graduate degree. A student with an undergraduate major in speech or English, for instance, may audit undergraduate courses in theater to make up any deficiencies.

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 course credit as members of the Southern Touring Company and the Summer Stock Company.

ZOOLOGY

Graduate work in zoology may be taken as a major or a minor toward the Master of Arts, Master of Science, and Doctor of Philosophy degrees and as part of a program in biological sciences toward the Master of Science and Master of Science in Education degrees.

Candidates for the Master of Science and Master of Arts degrees must have the consent of the department and at least 35 hours of undergraduate credit in zoology equivalent to 102, 103, 202, 300, 310, and 401. Further required undergraduate work includes one year of chemistry, one year of botany, two quarters of physics, and one year of, or demonstrated proficiency in, a foreign language. Deficiencies in undergraduate preparation may be removed concurrently with graduate work.

Completion of work for the Master of Science or Master of Arts degree requires, in addition to the general requirements of the Graduate School, an approved thesis, Zoology 581, and continuous registration in 582. A minor outside the department is recommended.

In addition to the above requirements for the master's degree, the Doctor of Philosophy degree requires organic chemistry, animal physiology, experience in marine ecology, and demonstrated proficiency in statistics and two foreign languages.

Course Descriptions

3

Here are described all of the courses offered by the University for graduate credit. Courses are listed numerically within each subject-matter area. Areas are listed below in the order of their appearance on the following pages.

Accounting	German	Mathematics
Agricultural Industries	Russian	Microbiology
Animal Industries	Spanish	Music
Anthropology	Romance Philology	Philosophy
Applied Science	Forestry	Physical Education
Art	Geography	Physics
Botany	Geology	Physiology
Chemistry	Government	Plant Industries
Clothing and Textiles	Guidance	Psychology
Design	Health Education	Recreation and Outdoor
Economics	Higher Education	Education
Educational	History	Secondary Education
Administration	Home and Family	Secretarial and Business
Elementary Education	Home Economics	Education
Engineering	Education	Sociology
Engineering Technology	Industrial Education	Special Education
English	Industrial Technology	Speech
Food and Nutrition	Instructional Materials	Speech Correction
Foreign Languages	Journalism	Technology
French	Management	Theater
	Marketing	Zoology

The first entry for each course is a three-digit numeral which, together with the subject area, serves to identify the course. Courses numbered 400-499 are open to both seniors and graduate students. A senior who wishes to receive graduate credit for a 400-level course during his last quarter of undergraduate study must apply for admission to the Graduate School and must obtain, at the time of registration, the approval of the instructor and the dean of the Graduate School; and the instructor must indicate on the class card which is submitted to the Registrar at the end of the quarter that the student has earned graduate credit in the course. Courses numbered above 499 are for graduate students only. A senior within 16 hours of graduation may take 500-level courses for graduate credit during his final quarter of undergraduate study if he has applied to the Graduate School.

Following the identification number are a dash and another number, which indicates the maximum credit allowed for the course. The maximum may be variable, such as *Art 405-2 to 12*. Some courses do not terminate at the end of one quarter, as evidenced by two or more numerals in parentheses indicating the credit allowed for each quarter of participation in the course.

Next is the title, followed by a description of the course. If certain requirements must be satisfied before enrollment in a course, they are listed as prerequisites.

The final entry for each course is a letter or two letters. The letter *C* means that the course is available only on the Carbondale Campus. Similarly, the letter *E* means Edwardsville Campus only. Both letters together mean that the course is offered at both campuses. However, not all of the courses described here are offered every quarter or even every year. To find out when and where a course is to be offered, consult the Schedule of Classes, which may be obtained from Central Publications, Southern Illinois University, Carbondale, Illinois 62903. When requesting a schedule, please specify *campus* (Carbondale or Edwardsville) and *quarter* (fall, winter, spring, or summer).

For example, *Applied Science 415-9 (3,3,3)* is offered at Carbondale only, for a total of 9 hours of credit. The course runs for three quarters at 3 hours per quarter. First one takes *415a-3*, then he takes *415b-3*, and finally he completes the course by taking *415c-3*.

ACCOUNTING

410-4 Survey of Accounting. Purpose is to permit non-accounting majors and teachers to study advanced accounting from the standpoint of its usefulness in controlling and administering an enterprise. Critical analysis of reports, statements, and other accounting data but with little attention given to accounting techniques used in collecting and reporting such information. Prerequisite: 250 or 251-12 or equivalent. Not open to accounting majors. C

415-4 Electronic Data Processing in Business. A study of the uses of electronic computers in business data processing. Includes an introduction to linear programming as it assists management in decision making. The student will prepare some programs in compiler language. There will be a limited amount of instruction in the operation of computer equipment. Prerequisite: 251-12 and consent of instructor. C

432-4 Problems in Federal Taxation. Study of income tax problems which arise from partnership, corporation, estate, and trust types of organization. Brief study of social security, federal estate, and gift taxes. Student does research in source materials in arriving at solutions of complicated tax problems. Prerequisite: 331. CE

442-4 Advanced Cost Accounting. Cost accounting for complex process production flows, joint products and by-products, spoilage, defective units and scrap. Managerial control and profit planning through capital budgeting, inventory planning, subjective probabilities, statistical methods, and operations research. Non-manufacturing costs, differential and comparative cost analysis. CE

458-4 Accounting Systems. Problems in accounting systems design and installation. Examination of existing systems and practice in system design and reports. Prerequisites: 341, 351-8. CE

459-4 Internship in Accounting. Supervised work experience in professional accounting. Prerequisite: outstanding record in accounting and recommendation of the committee on internship. C

461-4 C.P.A. and Advanced Accounting Problems. A problems course, using problems from the examination sponsored by the American Institute of Certified Public Accountants and given in the last few years. Some problems also drawn from other sources. Prerequisites: 341, 351-8. CE

500-1 to 5 Readings in Accounting. Directed readings on selected topics. C

501-1 to 5 Individual Research in Accounting. Directed research in selected areas. C

550-4 Accounting Theory. Contemporary advanced accounting theory, including controversial issues with emphasis on net income determinations and asset valuation. Particular attention given to current publications of the profession and governmental agencies. Prerequisite: 351-8 or 410 or equivalent. C

557-4 Advanced Auditing. A study of the development of auditing theory and its implications for auditing practice. Specific discussions of auditing standards and concepts are emphasized, including pronouncements and bulletins of the American Institute of Certified Public Accountants and current literature. Prerequisite: 356 or consent of instructor. C

562-4 C.P.A. and Advanced Accounting Problems. A problems course including some highly technical C.P.A. examination problems not covered in undergraduate courses. Prerequisite: 461 or consent of instructor. C

565-4 Controllership. A study of the function of controllership in a business organization. Includes an analysis of the duties and responsibilities of a controller, in his capacity as the chief accounting executive of a firm. Attention is given to the contribution of a controller to effective planning, co-ordination, and control through accounting. Case studies. Prerequisites: 341 and 351-8 or consent of instructor. C

599-1 to 9 Thesis. Minimum of 5 hours to be counted toward a master's degree. C

AGRICULTURAL INDUSTRIES

410-2 to 4 Problems in Agricultural Services. Discussion, assignments, and special workshops on problems related to in-service training programs in the agriculturally related fields. Development of more effective programs in working with farm people. Prerequisite: graduate student in agricultural services or consent of instructor. C

411-3 Agricultural Extension. A study of the history, organization, objectives, programs, and methods of agricultural extension work. Prerequisite: Journalism 393 and a course in psychology or sociology or consent of instructor. C

413-3 Agricultural Education Practices. C

417-4 Agricultural Development. Principles and practices in improving agriculture in areas with limited capital and low levels of technology. Special emphasis on developments in Asia, Africa, and South America. Prerequisite: GSB 211-9 and consent of chairman. C

450-4 Advanced Farm Management. Methods of analyzing farm enterprises, comparing farm enterprises, comparing farm businesses, allocating farm resources, combinations of enterprises, and production factors. Prerequisite: 350. Field trips cost about \$5. C

456-11 (3,2,2,2,2) Agricultural Marketing Problems and Practices. (a) Cooperatives. Development of the agricultural cooperative movement, agricultural cooperative organization, legal requirements, principles and practices of agricultural cooperative associations. (b) Livestock. Problems and their solutions in marketing livestock. (c) Field Crops. Problems and their solutions in marketing field crops. (d) Dairy and Poultry. Problems and their solutions in marketing dairy and poultry products. (e) Horticultural Crops. Problems and their solutions in marketing horticultural crops. Field trip cost \$5. Prerequisites: 354, GSB 211a, or consent of instructor. C

471-4 Land Resource Economics. (Same as Forestry 471 and Economics 471.) The use of land as an economic variable in production of goods and services; land markets; group versus individual conflicts; elementary land resources planning techniques. Field trips cost about \$5. Prerequisite: GSB 211, Econ. 215, or Forestry 215, or Forestry 470. C

478-4 Advanced Farm Machinery. Materials on construction; basic mechanics involved in tillage machinery; rotary powered transmission; product cleaning, drying, and sorting; costs of operation; materials handling. Prerequisites: 350, 373, 374, or consent of instructor. C

505-3 Agricultural Economics Research Methods. Agricultural economics research methods with particular reference to types of research problems encountered, sources of data, problems in developing new data and methods of analysis. Prerequisite: consent of chairman. C

- 520-1 to 6 Readings.** Contemporary books and periodicals on selected areas of the field. C
- 520b-1 to 6. Readings in Resource Economics.** (Same as Forestry 520b and Economics 502.) Directed reading in the field of natural resource economics. C
- 550-4 Production Management.** A study of the principles of production economics upon which problems in agricultural production and resource use can be analyzed. Emphasis on principles applicable to the farm business and to farm policy, including concepts relating to the decision-making process and farm planning under perfect and imperfect knowledge and with limited resources. Prerequisite: 12 hours equivalent in economics and agricultural economics and consent of instructor. C
- 552-2 Advanced Agricultural Prices.** Continuation of analysis of factors affecting agricultural prices; the application of these factors in price prediction. Prerequisite: 352. C
- 554-4 Advanced Agricultural Marketing.** Current complex problems in agricultural marketing and methods of developing solutions; co-operative activities. Prerequisite: 12 hours or equivalent in economics and agricultural economics. C
- 575-1 to 6 Research.** Directed research in selected areas of agricultural industries. C
- 581-1 to 6 Seminar.** Problems relating to various phases of the field of agricultural industries, such as farm management, marketing, prices, farm policy, land economics. C
- 582-1 to 3 Seminar on Foreign Agricultural Problems.** C
- 599-1 to 9 Thesis.** Minimum of 5 hours to be counted toward a master's degree. C

ANIMAL INDUSTRIES

- 415-8 (4,4) Animal Nutrition.** (a) Physical and chemical properties of nutrients and their uses and principles involved in determination of nutrient requirements. (b) An integration of the basic facts concerning the nature of nutrients and their metabolism. Must be taken in a,b sequence. Prerequisites: 315 and GSA 101 or equivalent. C
- 420-4 Commercial Poultry Production.** Broilers, layers, and turkeys as adapted to poultry specialty farms. Field trips. Prerequisite: 125. C
- 430-4 Dairy Production.** Milk production; feeding, breeding, calf raising; records, buildings, and equipment; sanitation; and disease. Field trip costs about \$5. Prerequisites: 231, 315. C
- 431-4 Reproduction and Artificial Insemination of Farm Animals.** The anatomy and physiology of reproduction and the principles of artificial insemination in farm animals. Prerequisites: 105 or 231, GSA 201c. C
- 432-3 Quantitative Inheritance of Farm Animals.** A review of the principles underlying the influence of mutation, selection, migration, and random drift in animal breeding population; estimation and interpretations of heritabilities and genetic correlations; effects of variances of quantitative traits of farm animals. Prerequisite: 332. C
- 433-3 Dairy Cattle Feeding.** Nutrient requirements of dairy cattle. Feeding calves and heifers for economical growth and cows for economical milk production. Pasture, hay, and silage utilization in milk production. Prerequisites: 231, 315. C
- 456b-2, 456d-2 Agricultural Marketing Problems and Practices.** (See Agricultural Industries 456.) C
- 465-4 to 5 Swine Production.** Breed selection, breeding, feeding, management, and marketing of swine. Field trip costs about \$3. Prerequisites: 105, 315. C
- 480-4 Sheep Production.** Breeding, feeding, and management of sheep. Field trip costs about \$3. Prerequisites: 105, 315. C
- 485-4 Beef Production.** Breeding, feeding, and management of beef and dual-purpose cattle. Field trip costs about \$3. Prerequisites: 105, 315. C
- 486-4 The Range Livestock Industry.** Designed to acquaint advanced animal industries students with range livestock operation; consists of full-time classroom review of beef cattle and sheep production followed by a two- to three-week field trip through the range area. Prerequisites: 480, 485. Summer only. C
- 487-3 Commercial Livestock Feeding.** Principles and problems in fattening beef

- cattle and sheep for market. Prerequisites: Animal Industries 105 and 315. C
- 505a-5 Research Methods in Agricultural Science.** Training and experience in designing experiments and use of various techniques in agricultural research. Prerequisite: consent of instructor. C
- 520-1 to 6 Readings in Animal Industries.** Readings in specialized fields under direction of approved graduate specialists. C
- 525-4 Advanced Poultry Production.** Study and interpretation of the objectives, design, and results of research in poultry feeding, breeding, and management. Prerequisite: consent of instructor. C
- 530-4 Advanced Dairy Production.** Study and interpretation of research in dairy farming, including buildings, herd management, quality milk production, and dairy marketing problems. Prerequisite: 430. C
- 565-4 Advanced Swine Production.** Study and interpretation of research in swine feeding, breeding, housing, management and marketing problems. Prerequisite: 465. C
- 575-1 to 6 Individual Research.** Investigation of a problem in animal science under the supervision of an approved graduate specialist in that field. C
- 581-1 to 6 Seminar.** Problems relating to various phases of animal industries. C
- 585-4 Advanced Beef Production.** Principles and practices in beef cattle production in the light of research findings. Prerequisite: 485. C
- 599-1 to 9 Thesis.** Minimum of 5 hours to be counted toward a master's degree. C

ANTHROPOLOGY

- 400-4 Man and Culture.** The nature of culture and cultural process. Relationships of culture and man as an individual and as a group. Emphasis on "the anthropological point of view." C
- 401-4 Language in Culture.** Language as a part of culture. Linguistics and the study of culture. C
- 404-4 Primitive Art and Technology.** The development of man as a tool-using and art-loving being. Artistic and technological traditions of non-Western peoples, past and present. C
- 405-4 Social Anthropology.** A comparative approach to the organizational features of human groups. Functional aspects and distributions of kinship, political, religious, and economic systems. C
- 408-4 History of Anthropological Thought.** The growth of anthropology to about 1860, followed by a more intensive survey of the concepts and ideas of anthropology during the past hundred years. C
- 409-4 Anthropology and Modern Life.** The applications of anthropological principles to the solution of problems of the modern world. Contributions of anthropology to the work of the educator, social worker, administrator, business man, government official, and other specialists dealing with man in Western and non-Western cultures. CE
- 430-4 Archaeology of North America.** An introduction to the methods of archaeology and a survey of prehistoric Indian cultures north of Mexico, with particular emphasis upon the cultures of the Mississippi Valley. E
- 470-4 Social Anthropology.** Theory and method in community study; functional analysis, cultural themes and values in both primitive and modern cultures. E
- 483-3 to 18 Individual Study in Anthropology.** Guided research upon anthropological problems. Students should consult the chairman before enrolling. C
- 501-9 (3,3,3) Pro-seminar in Physical Anthropology.** C
- 503-9 (3,3,3) Pro-seminar in Archaeology.** C
- 505-9 (3,3,3) Pro-seminar in Linguistics.** C
- 507-9 (3,3,3) Pro-seminar in Social Anthropology.** C
- 509-9 (3,3,3) Pro-seminar in Ethnology.** C

The 500-level courses listed above start in the fall and continue through the spring quarter. At the end of each course, a six-hour writ-

ten examination is given. The five six-hour written examinations of these courses constitute, together, Part I of the General Examination. Usually, though not necessarily, a student takes three of the pro-seminars his first year on campus, and the remaining two during his second.

A candidate for the General Examination must pass all five of the aforementioned examinations, whether he attends the courses or not, before he can proceed to Part II of the General Examination, which is a three-hour oral examination.

The following seminars are offered irregularly at the Carbondale campus and deal with areal and topical problems relevant to the title listed; they will vary in subject matter from year to year.

- 510-3 to 27 Seminar in New World Archaeology.
- 511-3 to 27 Seminar in Mesoamerican Archaeology.
- 512-3 to 27 Seminar in Old World Archaeology.
- 520-3 to 27 Seminar in the Ethnology of the New World.
- 521-3 to 27 Seminar in the Ethnology of Mesoamerica.
- 522-3 to 27 Seminar in the Anthropology of Oceania.
- 523-3 to 27 Seminar in the Anthropology of Africa.
- 524-3 to 27 Seminar in the Anthropology of Europe.
- 535-3 to 27 Seminar in Physical Anthropology.
- 545-3 to 27 Seminar in Linguistics.
- 550-3 to 27 Seminar in the Cultures of Latin America. Topics such as the impact of European conquest and dominance upon the native peoples and cultures in Latin America, pre- and post-conquest manuscripts, assimilation of non-indigenous peoples with the native cultures.
- 560-3 to 27 Seminar in Comparative Social Organization. Topics such as religion, political organization, social structure, economics, kinship.
- 562-3 to 27 Seminar in the Anthropology of Contemporary Peoples. Topics such as applied anthropology, peasant cultures, American culture and values.
- 565-3 to 27 Seminar in Cultural Change and Development. Topics such as the building of cultures, acculturation, the rise of civilization.
- 567-3 to 27 Seminar in Anthropological Theory and Method. The theory and method of archaeology, or ethnology or physical anthropology.
- 570-3 to 27 Seminar in Art and Technology. Topics such as the art of the early civilizations, the cultural background of art and technology, experimental problems of art and technology.
- 575-3 to 27 Seminar in the Individual and Culture. Topics such as themes and values, culture personality, enculturation, education.
- 581-3 to 27 Seminar in Anthropology.
- 582-3 to 27 Problems in Archaeology. Guided research upon archaeological problems.
- 584-3 to 27 Problems in Cultural Anthropology. Guided research upon problems of ethnology, social anthropology, and linguistics.
- 585-3 to 27 Readings in Anthropology. Guided readings designed to cover special topics and to fill gaps in the student's specialized anthropological background.
- 597-3 to 27 Fieldwork in Anthropology.
- 599-1 to 9 Thesis.
- 600-1 to 48 Dissertation.

APPLIED SCIENCE

415-9 (3,3,3) Water Supply and Waste Water Disposal. (a) A study of the principles involved in the collection, storage, treatment, and distribution of water for municipal, industrial, and irrigation use. (b) The removal of storm waters, municipal sewage, and excess irrigation waters; water rights and stream administration; water

quality criteria; the economic aspects of projects. (c) Theory of unit operations as applied to the treatment of water and waste water; and the design of works for the collection, treatment, and disposal of water and liquid wastes. Laboratory. Must be taken in a,b,c sequence. Prerequisite: consent of instructor. C

420-3 Digital Computers in Research. Basic foundations used in operations research. An intensive study in the use of digital computers as related to topics such as probability and statistics, matrices, game theory, Monte Carlo techniques, distribution and scheduling problems, and simulation. Prerequisite: 222. C

421-3 Programming Languages. A study of development and the use of automatic programming languages for stored program electronic computers. Included are symbolic languages, interpretive systems, algebraic-oriented and business-oriented data processing languages, macro assemblers, and list processors. (ALGOL, FORTRAN, COBOL, COMIT, IPL, etc.) A comparison of the languages will be made, and each student will prepare programs using the languages studied. Prerequisite: 222. C

422-3 Programming Systems. The use and methods of electronic data processing systems. Topics are searching, ordering, codifying, information retrieval, process control, executive routines, and heuristic programming. The student will apply system techniques for solution of problems using the computer equipment of Data Processing and Computing Center. Prerequisite: 222. C

431-9 (3,3,3) Nuclear Science. An introductory course to provide a background for further work in Nuclear Science. Lectures and problems in materials, heat transfer, and fluid flow. Emphasis is given to basic ideas and the mathematical similarity of the problems in heat transfer, fluid flow, and neutron diffusion. An introduction to reactor analysis. Use of an analog computer in solving problems of neutron transport and reactor kinetics. Prerequisite: differential equations (Mathematics 305a) and Physics 211c. C

450-4 Elementary Statistical Mechanics. Elementary statistical mechanics, with applications to simple physical and chemical systems. C

470-5 Introduction to Quantum Theory. Study of the experimental foundations of quantum mechanics and the quantum theoretical interpretation of atomic phenomena. C

501-9 (3,3,3) Materials Science. (a) The crystal structure of materials. (b) Crystal-line materials preparation. (c) Perfection of crystalline materials.

502-6 (3,3) Materials Structure Analysis. (a) X-ray diffraction techniques. (b) Crystal structure analysis. C

503-6 (3,3) Physical Properties of Crystalline Materials. (a) Equilibrium properties. Paramagnetic and diamagnetic susceptibilities. Electric polarization. Ferroelectricity, Ferro and Ferrimagnetism. Thermal expansion, Piezoelectricity. (b) Elasticity. Thermodynamics of equilibrium properties. Transport properties: thermal and electrical conductivity. Thermoelectricity. Crystal optics: optical activity. Non-continuous properties: cleavage. Plasticity. C

516-4 Water Resources Development. Seminar on engineering problems and economic factors relating to multiple-purpose water resources development. Planning of design features of components for system performance. The integrated use of water from all sources: ground and surface water, waste water, and saline water. Modern trends of large-scale land reclamation, hydropower, tidal power, and pump-storage schemes. Prerequisite: 415 C

521-6 (3,3) Design of Automatic Programming Language Processors. Analysis of design and construction of automatic programming language processors. An investigation of the structure of scientific and business oriented compilers, list processors, and information processing languages. The student will be expected to review recent papers on these topics, to prepare an aspect on theory, prepare flow charts and program segments of the processors for the language studied. Prerequisite: 421. C

522-6 (3,3) Programming Systems Design. Design of monitor systems, executive routines, simulators and other systems. An analysis of problems encountered in designing a programming system. The student will be expected to review recent papers on these topics, prepare flow charts, to complete an aspect of the theory, and to write programs for segments of the systems studied. Prerequisite: 422. C

ART

- Art Education: 408, 460, 466, 560, 566, 599.
- Art History: 445, 449, 471, 473, 475, 482, 483, 571, 573, 599.
- Studio Courses: 400, 401, 404, 405, 406, 410, 416, 420, 426, 430, 436, 440, 441, 446, 493, 501, 502, 504, 506, 511, 516, 520, 526, 530, 536, 540, 546, 599.
- 400-S (4,4) Research in Art. Projects undertaken combine academic research of a historical nature with technical experimentation on the part of the artist. The project, which may be in painting, prints, pottery, weaving, metalsmithing, or sculpture, is stated in writing and submitted for approval and evaluation to a committee constituted of two art instructors and a third faculty member. May be taken in a,b or b,a sequence. Prerequisites: consent of art faculty. E
- 401-2 to 12 Research in Painting. C
- 404-S (4,4) Studio in Art. Advanced independent study to be carried out under the committee established for 400. May be taken in a,b or b,a sequence: Prerequisite: 400-S. E
- 405-2 to 12 Studio in Sculpture. C
- 406-2 to 12 Studio in Painting. C
- 408-4 Art Education for Elementary Teachers II. C
- 410-2 to 12 Research in Prints. C
- 416-2 to 12 Studio in Prints. C
- 420-2 to 12 Research in Pottery. C
- 426-2 to 12 Studio in Pottery. C
- 430-2 to 12 Research in Metal Construction. C
- 436-2 to 12 Studio in Metal Construction. C
- 440-2 to 12 Research in Weaving. C
- 441-2 to 6 Studio in Drawing. C
- 445-9 (3,3,3) Modern Art. (a) 19th Century, (b) Early 20th Century, (c) Mid 20th Century. C
- 446-2 to 12 Studio in Weaving. C
- 449-3 Renaissance Art. 15th and 16th century European art with consideration of the significance of Renaissance art to the growth of Humanism. C
- 450-1 The Visual Arts in Higher Education. C
- 460-2 to 12 Research in Art Education. CE
- 466-2 to 12 Studio in Art Education. C
- 471-3 Baroque Painting in Italy. Major developments in style and expression in Italian painting from the late Mannerist period until the early 18th century. C
- 473-3 Romantic Art of the 19th Century. A study of the sources and characteristics of Romantic art, approached through the works of such masters as Gros, Delacroix, Blake, Friedrich, Goya, and certain Americans. C
- 475-3 Impressionist and Post-Impressionist Painting. The late 19th century in France: Impressionism, Neo-Impressionism, Pointillism, and early Expressionism. The styles of Manet, Monet, Degas, Renior, Seurat, Van Gogh, and Cezanne receive emphasis. C
- 482-3 Art History Seminar. Lectures, readings, and reports on artists, styles, subjects of special interest which will be announced periodically. C
- 483-3 to 12 Research in Art History. Individual research in the painting, sculpture, architecture, and related arts of the various periods. C
- 493-2 to 12 Advanced Sculpture. C
- 501-2 to 12 Seminar in Painting. C
- 502-2 to 12 Seminar in Sculpture. C
- 504-2 to 12 Research in Sculpture. C
- 506-2 to 12 Research in Painting. C
- 511-2 to 12 Seminar in Prints. C
- 516-2 to 12 Research in Prints. C
- 520-2 to 12 Seminar in Pottery. C
- 526-2 to 12 Research in Pottery. C

530-2 to 12 Seminar in Metal Construction.	C
536-2 to 12 Research in Metal Construction.	C
540-2 to 12 Seminar in Weaving.	C
546-2 to 12 Research in Weaving.	C
560-2 to 12 Seminar in Art Education.	C
566-2 to 12 Research in Art Education.	C
571-2 to 5 Readings in Art History.	C
573-3 to 12 Problems of Art History. A detailed study of single works of stylistic problems in selected areas of world art.	C
599-5 to 9 Thesis.	C

BOTANY

400-5 Plant Anatomy. An introduction to cell division, development, and maturation of the structures of the vascular plants. Laboratory. Prerequisites: 300, 301.	C
403-3 History and Principles of Plant Taxonomy. Important concepts in plant classification through the ages, and study of the International Code of Botanical Nomenclature. Consideration of the functions of genetics, evolution, morphogenesis, and ecology in taxonomy. Prerequisite: 203 or consent of instructor. May be repeated.	E
404-4 The Algae (C); 404-5 The Algae (E). Structure, development, and relationships of the algae. Laboratory and some field work. Prerequisite: 300.	CE
405-5 Mycology (C); 405-5 The Fungi (E). Structure, development, and relationships of the fungi. Problems of economic and scientific interest stressed. Laboratory. Prerequisite: 300.	CE
411-4 The Bryophytes and Pteridophytes. Structure, development, and relationships of the liverworts and mosses, and the ferns and fern allies. Laboratory, Prerequisite: 301.	C
412-4 The Spermatophytes. Structure, development, and relationships of the gymnosperms and angiosperms. Laboratory. Prerequisites: 301, 313.	C
413-5 Comparative Morphology of Vascular Plants. Comparative studies of representative groups of vascular plants, including origin, structure, developmental tendencies, embryology, and fossil evidence. Three lecture and four laboratory hours per week. Prerequisites: 101, 202.	E
414-5 Paleobotany. (Same as Geology 414). An introduction to the study of fossil plants emphasizing the major features of plant evolution and the applications of paleobotany to problems in the botanical and geological sciences. Lecture, laboratory, and field trips. Student cost about \$5. Prerequisite: 310 or 400 or consent of instructor.	C
420-4 Physiology of Fungi.	C
425-15 (5,5,5) Advanced Plant Physiology. (a) Physics of the plant, water relations, membrane phenomena, photobiology. (b) Covers the absorption, translocation, function and interaction of inorganic nutrient elements in green plants with application to forest, agronomic, and horticultural species. (c) Chemistry of the plant; anabolic and catabolic processes, photosynthesis, respiration, chemosynthesis. Prerequisites: 320, Chemistry 350, or a chemistry minor.	C
428-3 Plant Nutrition. The physiological importance of carbon-, nitrogen-, and phosphorus-containing compounds is stressed. Prerequisites: organic chemistry, minor in botany or agriculture.	C
440-4 Ecology of Grasses and Grasslands. Structure, analysis, and dynamics of grassland communities; structure and growth of individual species. Field and laboratory work costs about \$5. Prerequisite: GSA 340 or consent of instructor.	C
445-5 Ecology of Forests and Arable Lands. Forest areas in North America. Developmental and structural analysis of forest types. Autecology of important species. Field trips, approximate cost \$10. Prerequisite: GSA 340.	C
449-3 Elements of Taxonomy. Principles of taxonomy including historical sketch, phyletic concepts, biosystematics, classical and experimental methods. Lecture. Laboratory. Prerequisite: GSA 203.	C

450-3 Plant Geography. World distribution of plants related to environmental, floristic, and historical factors. Prerequisites: 3 courses in botany or geography or consent of instructor. C

451-4 Introduction to Floristics. Principles involved and methods used in the analysis of the flora of an area. Laboratory and field work. Student cost about \$5. Prerequisite: Botany 313; GSA 340. C

455-4 Medical Mycology. Fungi which are responsible for infection of man and animals. Problems of classification, identification, isolation, and activity of these fungi. Prerequisites: 405, Microbiology 100 or consent of instructor. C

456-5 Plant Pathology. (Same as Plant Industries 355.) 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. C

457-4 Forest Pathology. Nature and control of forest and shade tree diseases. A study of tree diseases in forests, parks, streets, and nurseries. Fungi important in decay and stain of timber and its products are included. Prerequisite: consent of instructor or 456. C

470-4 Methods of Teaching High School Biology. Methods, objectives, types of courses taught in secondary school biology. Laboratory and field trips. Prerequisite: major in botany or zoology. C

480-4 Classic Principles of Botany. Theories, principles, and developments in the various divisions of the plant sciences. Prerequisites: GSA 203, or consent of instructor. C

501-4 Plant Biology for High School Teachers. The principles of plant biology are illustrated. Emphasis is placed on the relation of the plant to the environment. Two lectures and two laboratories per week. Open only to graduate students in the National Science Foundation Program. Prerequisite: one year of biological science. C

502-2 Recent Developments in Biological Sciences. (Same as Zoology 502.) A series of lectures based upon recent research, designed to acquaint the teacher with advances and changes in concepts. Prerequisite: one year of biological science. C

503-15 (5,5,5) Angiosperm Taxonomy. (a) Systematic treatment of all families of the monocotyledoneae. (b, c) Systematic treatment of all families of dicotyledoneae. C

507-8 BSCS—High School Biology. C

522-5 Advanced Microtechnique. Preparation and presentation of research materials. Laboratory work only. Prerequisite: consent of department. Credit on work completed. C

525-5 Cytology. (Same as Zoology 525). Physiochemical, chemical, and morphological organization of the cell. Ultrastructure of the cellular organelles. Cytochemical and submicroscopical organization of the hereditary material. Morphology and function of the spindle of the nucleus and chromosomes during the mitotic cycle. Synthesis and replication of nucleic acids. RNA and protein synthesis. The genetic code. Enzymes and cell metabolism. Prerequisite: Botany 315 or Zoology 401. C

526-5 Cytogenetics. Correlation of cytology with genetics. Cell mechanics and nuclear division. Mitosis, meiosis, crossing over and mapping of chromosomes. Mutation, mitotic agents, effect of irradiation, polyploidy, structural aberrations, polytene chromosomes. Synthesis of new species, comparative karyomorphology. Evolution and cytogenetics. Prerequisite: 525 or consent of instructor (Carbondale); Botany 315 or Zoology 401 (Edwardsville). CE

533-3 to 4 Growth and Development in Plants. External and internal factors as they affect development and growth of plants, photoperiodism, and the role of growth-promoting substances. 1 hour to be arranged. Prerequisite: 320. C

542-3 Genecology and Community Concepts. Implications of findings on the nature of plant adaptation to environment. Genecology and physiological ecology viewpoints, considered at the species and community levels. Prerequisites: 340, or consent of instructor. C

543-5 Experimental Ecology. Experiments on plant response to environmental factors. Design of experiments, statistical methods, presentation of individual research findings. Laboratory. Prerequisites: 320, GSA 340, or consent of instructor. C

- 551-4 The Natural Vegetation of the Mississippi Basin, Upland.** Floristic studies of the upland vegetation which occurs in the central basin of the Mississippi River. Prerequisite: 313 or consent of instructor. C
- 552-4 Mississippi Flora, Aquatic.** An analysis of the aquatic vegetation of the Central Mississippi basin, discussing importance to wildlife. Prerequisite: 313 or consent of instructor. C
- 555-4 Advanced Plant Pathology I.** Diseases of field crops, horticultural crops, and trees incited by Phycomycetes and Fungi Imperfecti. Individual problems assigned. Prerequisite: 456 or consent of instructor. C
- 556-4 Advanced Plant Pathology II.** Diseases of field crops, horticultural crops, and trees incited by bacteria and viruses. Individual problems assigned. Prerequisite: 456 or consent of instructor. C
- 557-4 Advanced Plant Pathology III.** C
- 570-2 to 5 Readings.** C
- 580-1 to 4 Seminar.** To be taken by all graduate students majoring in botany. C
- 590-2 to 4 Introduction to Research.** Methods of presentation of research materials, including written reports, graphs, photographs, bibliographies. Taxonomy students learn to write keys and descriptions; Botanical Latin; nomenclature. C
- 591-3 to 9 Research.** Assignments involving research and individual problems. Prerequisite: consent of department. C
- 599-3 to 9 Thesis.** Work in the research for and presentation of a thesis. Not more than 9 hours nor fewer than 5 hours will be allowed on thesis work. Total hours in 591 and 599 cannot exceed 15 hours to be applied to the master's degree. C
- 600-1 to 48 Dissertation.** Minimum of 36 hours to be earned for the Ph.D. degree. C

CHEMISTRY

- 411-4 Intermediate Inorganic Chemistry.** Modern inorganic chemistry involving atomic structure, chemical bonds, complexes, and chelate structures; chemistry of familiar and less familiar elements. 3 lecture hours per week. Prerequisites: 460 or 461b. CE
- 412-3 Inorganic Preparations.** A study of several important inorganic syntheses. 1 lecture and 6 laboratory hours per week. Prerequisites: 235, 305b or 341c. CE
- 432-8 (4,4) Instrumental Analytical Measurements.** Theory and practice of instrumental analytical measurements, including spectrophotometric, electro-analytical, and chromatographic methods. 2 lecture and 6 laboratory hours per week. Prerequisite: 461b (May be taken concurrently). May be taken in either sequence. CE
- 433-3 Intermediate Quantitative Analysis.** A study of the analysis of complex materials, with emphasis on separations, functional group analysis, and instrumental applications. 2 lecture and 3 laboratory hours per week. Prerequisites: 432a and 461c. CE
- 444-3 Organic Reactions.** An intermediate course with emphasis on monofunctional compounds. Additional topics, not included in elementary courses, will be considered. 3 lecture hours per week. Prerequisite: 341c. C
- 446-4 Qualitative Organic Analysis.** A systematic study of the separation and identification of organic compounds by a procedure based on solubility and classification reagents. 2 lecture and 6 laboratory hours per week. Prerequisite: 305b or 341c. CE
- 447-3 Quantitative Organic Chemistry.** The determination of functional groups and elements commonly found in organic compounds by selected methods of analysis; illustration of general method of procedure in the field of quantitative organic chemistry. 1 lecture and 6 laboratory hours per week. Prerequisite: 305b or 341c. C
- 451-11 (3,3 or 4,3 or 4) Biochemistry (C); 451-8 (4,4) Biochemistry (E).** (a) Chemistry, function, and metabolism of carbohydrates; energy metabolism, vitamins. (b) Enzymes, lipids, amino acids, proteins. Modern laboratory methods. (c) Enzyme kinetics, nucleic acids, comparative biochemistry. Prerequisite: 235, 305b or 341c. Must be taken in a,b,c sequence. CE
- 460-5 Theoretical Chemistry.** Traditional aspects of physical chemistry without the

requirement of calculus. Lecture and laboratory. Prerequisites: 235, 305b or 341c, and one year of physics or consent of instructor. CE

461-12 (4,4,4) Physical Chemistry. (a) Gases, liquids, solids, solutions, and homogeneous and heterogeneous equilibria. 3 lecture and 3 laboratory hours per week. (b) Chemical kinetics, electrical conductance, electromotive force, and electrolytic equilibrium. 3 lecture and 3 laboratory hours per week. (c) Chemical thermodynamics, the quantum theory, nuclear structure, photochemistry, atomic and molecular structure. 3 lecture and 3 laboratory hours per week. Prerequisites: 235 (concurrent), 341c, 12 hours of physics, and one year of calculus. Must be taken in a,b,c sequence. CE

464-3 Intermediate Physical Chemistry. Intermediate between the first year of undergraduate physical chemistry and advanced physical chemistry. Gives a broad foundation in physical chemistry. 3 lecture hours per week. Prerequisite: 461c. CE

471-3 Industrial Chemistry. A survey course on modern industrial chemistry and an introduction to chemical research processes. 3 lecture hours per week. Prerequisite: 305b or 341c. C

490-2 Chemical Literature. A description of the various sources of chemical information and the techniques for carrying out literature searches. 2 lecture hours per week. Prerequisites: 235, 305b or 341c, reading knowledge of German or consent of instructor. CE

496-2 to 6 Chemical Problems. Investigation of relatively simple problems under the direction of a staff member. Prerequisites: senior standing, major in chemistry with 4.0 average, and consent of chairman. CE

511-9 (3,3,3) Advanced Inorganic Chemistry. Lecture. (a) A theoretical and empirical treatment of chemical bonding and molecular structure. (b,c) A systematic consideration of the chemistry of the elements, including special topics such as non-aqueous solvent systems, and inorganic stereochemistry. Must be taken in a,b,c sequence. Prerequisite: 461c. C

517-3 Laboratory Techniques in Inorganic Chemistry. Techniques for the inorganic research chemist. Includes advanced synthetic problems using glove box for dry and inert atmosphere and high vacuum apparatus. Prerequisites: 412, 511c. C

519-2 to 30 (2 to 6 per quarter) Advanced Topics in Inorganic Chemistry. Selected topics such as coordination compounds, less familiar elements, nonaqueous solvent systems, and others. Prerequisites: 511c and consent of instructor. C

531-3 Theory of Quantitative Analysis. The phenomena utilized in analytical chemistry, with emphasis on separation, organic reagents, and complex methods. Lecture. Prerequisite: 433 or equivalent. C

532-3 Instrumental Methods of Analysis. Theory and practice of instrumental measurements in analysis with emphasis on commercial samples and applications to research. Lecture and laboratory. Prerequisites: 432, 460 or 461b (concurrent). C

533-3 Industrial Analytical Methods. Theory of analytical procedures and techniques, current industrial applications. Lecture. Prerequisite: 532. C

539-2 to 30 (2 to 6 per quarter) Advanced Topics in Analytical Chemistry. Selected topics such as microanalytical chemistry, absorption spectroscopy, and electroanalytical chemistry; not more than 6 hours per quarter. Prerequisites: 432, 531. C

541-3 Advanced Organic Chemistry. Theoretical organic chemistry with emphasis on electronic theory and reaction mechanisms. Lecture. Prerequisite: 444 or satisfactory diagnostic test. C

542-3 Advanced Organic Chemistry. Application of modern theory to synthesis and reactions of organic compounds, with emphasis on polyfunctional compounds. Lecture. Prerequisite: 541. C

543-3 Advanced Organic Chemistry. The application of physical methods to organic chemistry; stereochemistry. Prerequisite: 542. C

547-3 to 6 Advanced Laboratory Preparations in Organic Chemistry. Prerequisite: 446 and consent of instructor. C

549-2 to 30 (2 to 6 per quarter) Advanced Topics in Organic Chemistry. Such topics

- as heterocycles, natural products, and quantitative organic theory. Prerequisite: 543. C
- 551-3 Advanced Biochemistry.** Proteins and nucleic acids. Three lecture hours per week. Prerequisite: 451c. C
- 552-3 Advanced Biochemistry.** Chemistry of simple sugars, oligosaccharides, and polysaccharides. Three lecture hours per week. Prerequisite: 451c. C
- 553-3 Advanced Biochemistry.** Plant biochemistry. Three lecture hours per week. Prerequisite: 451c. C
- 554-3 Biochemical Mechanisms.** Molecular transformations in biochemistry in terms of general mechanistic principles in chemistry. 3 lecture hours per week. Prerequisite: 451c. C
- 555-3 Enzymes.** Advanced enzyme chemistry. 3 lecture hours per week. Prerequisite: 451c. C
- 559-2 to 30 (2 to 6 per quarter) Advanced Topics in Biochemistry.** Selected topics such as enzymology and physical biochemistry. Prerequisite: 451c. C
- 561-3 Chemical Thermodynamics.** Basic methods and theories as applied to chemical problems. Lecture. Prerequisites: 461c and satisfactory diagnostic test. C
- 562-3 Atomic and Molecular Structure.** A survey of basic principles in atomic spectroscopy, quantum chemistry, and statistical thermodynamics. Lecture. Prerequisite: 561. C
- 563-3 Chemical Kinetics.** Factors determining the rates of chemical reactions. Lecture. Prerequisite: 562. C
- 569-2 to 30 (2 to 6 per quarter) Advanced Topics in Physical Chemistry.** Colloids and macromolecules, quantum chemistry of atoms, diatomic molecules or polyatomic molecules, statistical mechanics and others. Prerequisite: 561. C
- 575-1 to 3 Graduate Seminar.** Advanced level talks presented and discussed by graduate students. Required for all graduate students. C
- 594-2 to 15 (2 to 6 per quarter) 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, (c) organic, (e) physical. Prerequisite: 24 hours of 500-level chemistry and consent of chairman. C
- 595-0 to 9 Advanced Seminar in Chemistry.** A seminar for each field of chemistry. Prerequisite: consent of chairman. C
- 596-3 to 9 Advanced Chemical Problems.** Individual study and investigation in preparation for research. Prerequisite: 12 hours of graduate credit. C
- 597-3 to 15 Research and Thesis.** Prerequisite: consent of chairman. C
- 598-3 to 48 Research—Doctoral.** Prerequisite: consent of chairman. C
- 600-3 to 48 Dissertation—Doctoral.** Prerequisite: 598. C

CLOTHING AND TEXTILES

- 423-4 Advanced Family Housing.** (See Home and Family 423.) C
- 431-4 Advanced Applied Design.** Research problems in experimentation with materials in textile design, linoleum block printing, stencilling, contemporary embroidery, silk-screen printing, etc. Prerequisite: 131 or consent of instructor. C
- 432-2 to 8 Workshop.** Designed to aid leaders in the field with current problems. Discussion, reports, lectures, and other methods of analyzing and working on solutions to problems. Prerequisite: consent of chairman. C
- 433-4 Advanced Pattern Designing.** Experimentation in the application of flat pattern design principles to the making of patterns for garments of various designs. Emphasis upon suitability of patterns for specific fabrics. Construction of garment as final step in experimentation. Prerequisite: 233 or consent of instructor. C
- 434-4 History of Costume.** The history of costume from prehistoric times to the present. Social, economic, and aesthetic developments that influenced its design. C
- 461-4 Problems in Fitting and Pattern Alterations.** Principles of fitting and pattern alterations as related to various figure types and special figure problems. Application made by fitting and constructing a garment. Prerequisites: 127, 233, or equivalent. C
- 473-4 Advanced Tailoring.** The student will tailor one garment for herself. Time-

saving methods, high-quality construction details, and professional finishes stressed. Prerequisite: 360 or equivalent. Offered on demand. C

474-4 Advanced Textiles. The physical and chemical analysis of textiles. Problems dealing with standards, labeling, and legislation. Current literature of developments with the field. Prerequisites: 322, GSA 101c or consent of instructor. C

481-2 to 6 Readings. Supervised readings for qualified students. Prerequisite: consent of instructor and chairman. C

528-4 Recent Developments in Clothing and Textiles. Emphasis on the physical properties of the currently marketed fibers and fabrications. Interpretation of these to design and clothing construction. Prerequisites: 127, 135, or consent of instructor. C

570-4 Clothing and Textiles Seminar. Selected problems within the field of clothing and textiles. Offered on demand. C

571-4 Recent Research. Review of selected research in various phases of home economics in related fields. Sources of research include colleges, universities, and governmental and industrial agencies. C

572-2 to 8 Special Problems. For students recommended by their chairman and approved by the chairman of Clothing and Textiles and the instructor in charge for independent work or directed study. C

582-4 Foundations of Fashion. Anthropological approaches to fashion and socio-economic and psychological forces as determinants of fashion in modern times. Prerequisites: 329, 339, or consent of instructor. C

599-5 to 9 Thesis. Minimum of 5 hours to be counted toward a master's degree. C

600-1 to 48 Dissertation. Minimum of 36 hours for the Ph.D. degree. C

DESIGN

400-0 to 2 Materials and Basic Techniques. Same as 200 and 300. C

465F-5 to 15 Research in Product-Shelter Design. Problems dealing with large groups. All problems carried from conception to actual full-scale construction. Development of prototype for mass-production techniques. Small research projects will be developed under grants given to the department. Prerequisite: 12 hours of 366 or its equivalent. C

465G-5 to 15 Research in Visual Design. Problems dealing with room-to-eye scale and larger, i.e., posters, car cards, strip film, film, exhibitions, etc. Advanced graphic and photographic technology. Development of prototypes for mass-production techniques. Small research projects will be developed under grants given to the department. Prerequisite: 12 hours of 375 or its equivalent. C

490F-2 to 12 Studio in Product-Shelter Design. Special projects, developed with adjunct and visiting professors. C

490G-2 to 12 Studio in Visual Design. Special projects developed with adjunct and visiting professors. C

520-4 to 10 Educational Tool Systems. Designs of specialized instructional tools, including design of learning environments and ancillary support systems for programmed learning. C

530-4 to 12 Studies in the Industrial Process. Design of products and product systems utilizing contemporary technology for solutions to significant human needs. C

535-4 to 12 Research in Product Design. Studies of specialized needs or problem areas (i.e., equipment for the handicapped, needs of underdeveloped areas, etc.). C

540-4 to 12 Studies in Communications Design. Concerned broadly with the over-all systems of human communications, including visual and graphic media. C

545-4 to 12 Research in Communications Design. Specialized areas of visual and graphic communication extended through various technical systems. Development of related systems involving whole range of communications. C

550-2 to 16 Field Study in Design. Design activity (local, national, or international) carried out with a designated faculty member as liaison. Written report assigned and final report required. All projects must first have written approval by the chairman and the liaison faculty member. C

560-4 to 12 Environmental Control. Selected studies in environ control systems, with particular reference to latest technical advances (i.e., closed ecology and autonomous systems developments) and to contributions in the study of human environment control by other disciplines. C

570-4 to 12 Design Science Exploration. Procedural methodology and systems approach to comprehensive anticipatory design science. C

575-4 World Ecological Studies. Review and analysis of man's present socio-economic situation in terms of scientific and technological trending-material and energy resources, human ecology networks. C

576-4 to 8 Structural Evolution. Structural morphology and relational hierarchies in science and technology. Differentiation and evolution of industrial tool complex: analysis of world service industry networks.

599-2 to 9 Thesis. Minimum of 5 hours to be counted toward a master's degree. C

ECONOMICS

408-4 Economic and Business Statistics II. Techniques for making decisions when the economic conditions are not known with certainty. 3 hours lecture; 2 hours laboratory. Prerequisite: 307 or GSD 110, or GSD 108c, or GSD 114c, or consent of instructor (C); 307 or GSD 114d (E). CE

411-4 Collective Bargaining and Dispute Settlement. Nature, issues, procedures, economic effects. Analysis of actual collective bargaining situations. Prerequisite: 310 or consent of instructor. CE

416-4 Money and Banking II. Emphasis upon the Federal Reserve System and other banking systems. Prerequisite: 315 or consent of instructor. CE

418-4 Economic History of Europe. A survey of the economic growth of Europe with emphasis upon the development of European agriculture, industry, finance, and international trade since 1750. Prerequisites: 205 or GSB 211a, or consent of instructor (C); 210 (E). CE

419-4 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. Prerequisites: 205 or GSB 211a. C

429-4 International Economics. Intensive treatment of the principles of international economics with special emphasis on the classical and modern theories of international trade. Income effects. Balance of payments adjustments. Prerequisites: 205 and 206, or 214 and 215, or consent of instructor. C

430-4 Regional Economy. Natural economic regions, governmental action (as in the T.V.A.), local applications. Prerequisites: (205 and 206) or (214 and 215). C

431-3 Public Finance II. State and local. Prerequisite: 330 or consent of the instructor. CE

432-3 to 4 Fiscal Policy of the United States. Countercyclical, secular, and emergency use of government expenditures, debt, and taxes. Prerequisites: 205 and 206, or 214 and 215, or consent of instructor (C); 210 (E). CE

436-3 Government and Labor. (Same as Government 436.) A study of labor relations and legislation considering both constitutional and economic aspects. Prerequisite: 205 or 215 or GSB 211c or consent of instructor. CE

440-4 Intermediate Micro Theory. A more intensive treatment of price and income theory. Prerequisites: 205 and 206, or 215, or consent of instructor (C); 210 (E). CE

441-4 Intermediate Macro Theory. Basic analytical concepts of the modern theory of aggregative income determination. Prerequisites: 205 or 214 or consent of instructor (C); 210 (E). CE

450-6 (3,3) History of Economic Thought. The development of economic thought; (a) ancients to 1850; (b) 1850 to present. Must be taken in a,b sequence. Prerequisites: 205 and 206, or 214 and 215, or consent of instructor. CE

460-4 Russian Economy. Development of Russian trade, agriculture, industry, gov-

ernment, finance, and standards of living in successive periods in relation to the historical, geographic, economic, and ideological background. Prerequisite: 205, or GSB 211a, or consent of instructor. C

461-4 Comparative Economic Development in Asia. A comparison of the economies of Japan, India, and China within the framework of emerging economic theory of developing economies. Prerequisite: 205, or GSB 211a, or consent of instructor. C

465-4 Mathematical Economics I. A systematic survey of mathematical economic theory. Conditions of static equilibrium (including stability conditions), dynamic models using difference equations, and linear production models of input-output analysis and activity analysis (linear programming). Prerequisite: 440 and consent of instructor C

467-4 Econometrics I. Introduction to resource allocation under uncertainty. Probabilistic economic models, theory of games and economic choices, and stochastic economic processes. Prerequisite: consent of instructor. C

470-3 Business Cycles. Major business fluctuations in the United States. Prices, employment, production, credit, inflation and deflation, and government action during the cycles. Prerequisite: 315, or 441, or consent of instructor (C); 315 (E). CE

471-4 Land Resource Economics. (Same as Forestry 471 and Agricultural Industries 471.) The use of land as an economic variable in production of goods and services; land market; group versus individual conflicts; elementary land resources planning techniques. Prerequisite: 440, or 441, or Agricultural Industries 350, or Forestry 470. C

481-4 (C); 481-3 Comparative Economic Systems (E). Capitalism, socialism, fascism, and other forms of the economy. Prerequisite: 205, or 214 and 215, or consent of instructor (C); 210 (E). CE

490-4 Workshop in Economic Education. (Same as 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. CE

500-4 to 8 Economics Seminar. A study of a common, general topic in the field of economics, with individual reports on special topics. Prerequisite: 206 or 214 and 215, or consent of instructor. C

501-1 to 5 Economics Readings. Contemporary books and periodicals in economics. Prerequisite: consent of chairman. C

502-1 to 6 Readings in Resource Economics. (Same as Forestry 520B and Agricultural Industries 520B.) Directed readings in the field of resource economics. Prerequisite: consent of instructor. C

512-4 Labor Economics. Economic principles involved in the employment relationship. Such topics as wage theory, the labor market, employment and unemployment, and the economic effect of collective bargaining are covered. Prerequisite: 310, or 411, or consent of instructor. C

517-4 Monetary Theory and Policy. Current monetary theory and policy emphasized. Federal Reserve policy is analyzed. Necessity for coordination of monetary policy with fiscal policy and debt management operations is discussed. Prerequisites: 315 and 441 or consent of instructor. C

519-4 Economic Growth. Intensive examination of the problems (past and present) of economic development faced by nations everywhere. Attention to the alternative solutions which have been, or are being, attempted. Prerequisite: 317 or 418 or consent of instructor. C

530-4 Foreign Trade and Finance. Emphasis on the advanced theory of international trade and finance. Survey of significant literature in international theory. Study of more advanced tools of analysis. Prerequisite: 429 or consent of instructor. C

531-4 Seminar in International Economics. Application of theory to current international economic developments. Empirical studies. Foreign economic policy. Prerequisite: 530 or consent of instructor. C

533-4 Public Finance Theory and Practice. Historical development of public finance theories with analysis of their policy implications. Prerequisite: 330, or consent of instructor. C

541-4 National Income Theory. Keynesian and post-Keynesian developments in national income theory. Empirical research concerned with characteristics and magnitudes of important national income concepts, such as the consumption function, is examined. Recent American policies and problems bearing on national income fluctuations are considered. Prerequisite: 441 or consent of instructor. C

542-4 Price Theory. Designed to develop skills in the use of the analytical tools, including the basic mathematical techniques, used in price theory. Prerequisite: 440 or consent of instructor. C

543-4 Seminar in Economic Policy. A consideration of departures in the American economy from the principle of resource allocation by the price system and an attempt to develop principles of economic policy which could serve as guides in efforts to raise living standards and promote economic growth. Prerequisite: 440 and 441 or consent of instructor. C

552-4 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 economic theories. Prerequisite: 450-6 or consent of instructor. C

562-4 Seminar in Economic Systems. A final, theoretically-oriented examination of economic systems. Includes recent theoretical models; contemporary changes in major economic systems; the emergence of mixed systems. Relates economic, social, and political systems and evaluates attempts to place economic systems within the context of general systems theory. Prerequisite: 481 or consent of instructor. C

566-4 Mathematical Economics II. Linear economic models. Linear programming. Input-output analysis and general equilibrium models. Prerequisite: 440 or 465 or consent of instructor. C

575-4 Economic Regulation. An analysis of the economic causes and effects of the regulation of agriculture, business, and labor. Prerequisite: 440 or consent of instructor. C

581-4 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. C

582-0 to 4 Economic Behavior. A theoretical and empirical study of the behavioral aspects of economics, including the behavior of firms, households, and government. This course draws upon the recent literature of economics and also, on frontier areas, upon directly relevant concepts and findings of related behavioral sciences. Prerequisite: 440 or equivalent or consent of instructor. C

599-2 to 9 Thesis. Minimum of 5 hours to be counted toward a master's degree. C

600-3 to 48 Doctoral Dissertation. Hours and credit to be arranged by chairman. C

EDUCATIONAL ADMINISTRATION

420-4 Legal Basis of American Education. Particular emphasis is placed on common-law principles. Prerequisite: 424. CE

424-4 School Administration. Designed primarily for those who look forward to positions as supervisors, principals, or superintendents. Prerequisite: 460. CE

431-4 History of Education in the United States. An historical study of the problems of American Education which have relevance to contemporary education. CE

432-4 Public Opinion, Propaganda, and Education. Analysis and classification of propaganda. Designed to show how public opinion is formed by a use of current materials from the different channels of communication. Differences between propaganda and indoctrination. CE

434-1 to 3 Administrator's Workshop. A special program for the consideration of administrative problems pertinent to superintendents, high school principals, and elementary school principals. Prerequisite: 424. C

456-4 School Supervision. The function of the principal or supervisor in the improvement of instruction. Some activities, methods, and devices for improving the effectiveness of teaching. Prerequisites: 424, and 535 or Elementary Education 557 or Secondary Education 564. CE

- 460-4 Curriculum.** Modern practices and procedures in curriculum development, with attention to the professional, social, economic, and other major factors in curriculum planning. Prerequisite: 500. C
- 485-4 to 9 Educational Utilization of Community Resources.** A workshop providing an opportunity for teachers to acquire a detailed knowledge of community resources, construct teaching units utilizing these resources and assemble files of resource materials dealing with economic and social problems of the community. CE
- 500-4 Research Methods.** Introduction to educational research with practical training in research writing techniques and evaluation in education. Prerequisite: Guidance 422b. CE
- 501-0 to 4 Seminar in Educational Administration.** The interdisciplinary approach to the study of the theory of educational administration. Open to 6th-year and doctoral students only. CE
- 502-4 Seminar in Comparative Education.** Educational ideas and practices of various countries of the world, both Eastern and Western, and their impact upon our culture and education. Prerequisite: consent of instructor. CE
- 502S-4 Seminar in Comparative Education: Soviet Russia.** A study of Soviet education in historical, cultural, political, philosophical, and world perspective. Emphasis is on education in Communist morality and the creation of the "New Soviet Man." Includes a consideration of the challenge to American education and the issue of the study of Communism in our schools. C
- 503-0 to 4 Seminar in Philosophy of Education.** An interpretation of modern educational problems and trends in the light of basic philosophical viewpoints. Excerpts from leading writings will be used. Prerequisite: 554 or consent of instructor. C
- 504-4 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. C
- 506-4 Seminar: Curriculum in Relation to American Culture.** The effect of historical movements on curriculum in our nation at all age and grade levels, continued on a more intensive basis as applied to present-day curricular patterns. Prerequisite: 460 or consent of instructor. C
- 507-12 (4,4,4) The Twentieth Century and Education.** Major movements in the contemporary world are studied in terms of their importance for American Education. C
- 511-12 (4,4,4) Internship Practicum.** The study of theory and practice in school administration pursued simultaneously by the student in cooperation with a public school and the Department. Admission by approval of the Department Advisory Committee. C
- 520-4 Illinois School Law.** Study of the legal aspects of Illinois public education with principal emphasis on statutory law and its interpretation by the courts. Prerequisite: 420. CE
- 525-4 Personnel Administration.** E
- 527-4 to 6 Administrative Problems of Small Schools.** A field laboratory course for principals and superintendents. Prerequisite: 424. C
- 533-4 School Buildings.** Various phases of physical plant design and maintenance of concern to the school administrator. Prerequisite: 424. CE
- 534A-4 School Finance.** A study of the principles and issues of Public School Finance. Revenues, expenditures, indebtedness, and fiscal controls are dealt with. Prerequisite: 424. CE
- 534B-4 School Business Administration.** Principles and practices governing management of business affairs of a public school system. Prerequisite: 424. CE
- 535-4 Research in Problems of School Administration.** An intensive course for school principals on the theory and principles of administration. Prerequisite: 424. C
- 539-4 Community Development Through the School.** Comprehensive survey of the resources of a particular community; the cataloguing of material for the use by the teachers of the community to help determine needed curriculum changes. Prerequisite: 460. C
- 554-4 Contrasting Philosophies of Education.** Deals both historically and contempo-

raniously with the ideologies which have developed from different concepts of education. Prerequisite: 355 or Philosophy 355 or consent of instructor. CE

556-4 Seminar in Educational Supervision. Special research problems in supervision, for advanced graduate students. Prerequisite: 456. CE

563-4 Workshop in School Public Relations. To meet the needs of teachers, supervisors, and administrators in the area of public relations. Prerequisite: consent of instructor. CE

565-4 The Junior College. E

575-1 to 4 Individual Research. Selection, investigation, and writing of a research project under the personal supervision of a graduate faculty member. Prerequisite: 500, approval of department adviser and consent of instructor. CE

576-1 to 4 Readings in Administration and Supervision. Open only to advanced graduate students. Prerequisite: 501. C

589-2 to 12 General Graduate Seminar. (Same as Philosophy 589.) For students having special interests in the history of philosophy and the original systematic development of philosophic ideas. Prerequisite: consent of instructor. C

591-4 Seminar—Social and Philosophical Foundations. Follows Guidance 590 as second quarter of a two-quarter sequence required of all students who are beginning advanced graduate study for the Ph.D. degree in education. Prerequisite: Guidance 590. C

596-5 to 9 Independent Investigation. Field study required of each student working for the sixth-year certificate. C

597-1 to 3, 598-1 to 3, 599-1 to 3. Thesis. Minimum of 5 hours to be counted toward a master's degree. C

600-1 to 48 Dissertation. Minimum of 36 hours to be earned for the Ph.D. degree. C

ELEMENTARY EDUCATION

401-2 Problems in Public School Reading. Requirements: attendance at all sessions of a reading conference; preparation of a paper showing practical applications of theory to the student's own teaching situation. Summer. C

402-4 Aero-Space Education Workshop. (See Secondary Education 402.) C

410-4 Improvement of Instruction in Arithmetic in Kindergarten-Primary Grades. Recent findings and current practices in building a basis for quantitative thinking in early childhood education. Special emphasis upon grade placement of content and of techniques to aid children in understanding of the number system. Prerequisite: Mathematics 210. C

411-4 Seminar in Instruction. To assist student teachers and in-service teachers in solving classroom problems. Involves clinical study and discussion of behavioral and learning situations, with special attention to the development of characteristics and needs of students. C

413-4 Children's Literature. Emphasizes types of literature, analysis of literary qualities, selection and presentation of literature for children. Not for students who have had English 213. Prerequisite: Guidance 305. CE

415-2 to 4 Improvement of Instruction in Arithmetic in the Elementary School. Items to be taught, the grade placement of content, newer instructional practices and materials of instruction, and means of evaluating achievement. Prerequisite: Mathematics 210 or consent of instructor. CE

430-3 Workshop in Creative Writing in the Elementary School. Techniques of encouraging creative writing in the elementary school. C

433-4 Workshop in Elementary Education. Meets needs of in-service teachers in such areas as curriculum adjustment, remedial teaching, child development, and early childhood education. No credit if student has had 333 or 390. CE

435-4 to 8 Workshop in Elementary School Foreign Language Instruction. Designed to assist elementary school teachers in integrating foreign languages into their teaching program as well as to encourage high school teachers to introduce or supervise foreign languages or education. Prerequisite: basic language credit. CE

- 437-4 Problems in Reading.** Practices and trends in the teaching of reading; materials of instruction in reading, particularly remedial materials; techniques and materials for prevention of reading difficulties; diagnosis and remediation of reading difficulties. Prerequisites: senior standing, 337. Not open to students having had 505. CE
- 441-4 Teaching Elementary Science.** A workshop course for teachers of elementary school science. C
- 442-4 Materials and Methods in Elementary School Science.** Study of content and methods of elementary school science. CE
- 443-4 Workshop in Social Studies.** Material on critical areas of the world, not commonly emphasized in elementary social studies. Areas considered: significant geographical concepts, Asia, Africa, Russia, and Eastern Europe. Outstanding specialists in social science present their specialties. C
- 465-4 Seminar in Psychology of Elementary School Subjects.** Psychological principles of learning applied to the mastery of materials used in elementary school subjects. Prerequisites: 314, Guidance 305. CE
- 490-2 to 3 Workshop in Economic Education in Elementary Schools.** A study of newer programs stressing economic understandings of the social studies in the elementary school. C
- 505-4 Improvement of Reading Instruction.** First course in the reading sequence, survey of reading problems, aspects of the reading process, modern practices in teaching reading. CE
- 507-2 to 4 Readings in Reading.** Independent reading; acquaintanceship with the literature and research in reading. Conference periods. CE
- 509-4 to 8 Practicum in Reading.** For advanced students; teaching demonstrations and evaluations. Each student works with a group of reading disability cases. C
- 510-4 to 8 Seminar: Problems in 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. C
- 514-4 Organization and Administration of Reading Programs.** For reading specialists, principals, supervisors, consultants. Recent trends in elementary and high school reading programs, providing reading instruction for total school population, materials and equipment, in-service training, role of the reading specialist. Problems of class members are studied and discussed. Prerequisite: 461. CE
- 515-4 Special Problems in the Teaching of Arithmetic in the Elementary School.** A seminar course which covers important problems in arithmetic in the elementary school. Variable content. Prerequisite: 415 or consent of instructor. CE
- 516-8 to 12 Internship in Reading.** Culminating experience for doctoral candidates. Each student supervises reading services in his own or co-operating school. Conference periods. C
- 517-2 to 4 Kindergarten-Primary Practicum.** Practical applications of advanced theory in the Laboratory School. Readings and research related to special problems in the kindergarten-primary classroom. Prerequisite: 8 hours of student teaching. C
- 518-2 Supervision of Student Teachers.** The function of the supervisory teacher in the student teacher situation. Particular attention to the problem of student teaching in the public schools. A course for present and prospective teachers who wish to be more effective in dealing with student teachers. CE
- 521-9 (3,3,3) (C); 521-3 to 4 (E). Diagnosis and Correction of Reading Disabilities.** Causes of reading difficulties; observation and interview procedures; standardized tests, instruments, and informal inventories; analysis techniques; experiences in preparing materials for corrective purposes. Each student diagnoses and treats a reading disability case under supervision. Prerequisite: 505 or 540 or concurrent registration with 505. CE
- 525-4 Kindergarten-Primary Seminar.** Exploration of research literature on problems in early childhood education. Each student to select problem or problems and to present paper to the seminar. Prerequisite: Educational Administration and Supervision 500 or equivalent. C
- 537-4 Kindergarten-Primary Reading.** A survey of problems in the developmental

reading program for the primary grades, followed by extensive study of selected problems. Prerequisite: 337 or consent of instructor. C

541-4 Selected Teaching and Curriculum Problems in Elementary School Science. Aims, methods, materials, and equipment. Emphasis upon grade placement of materials and use of community resources. CE

542-3 to 4 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. CE

543-4 Teaching the Social Studies in the Elementary School. Organization of material for teaching purposes, techniques of classroom presentation, bibliographies or materials, use of audio and visual aids to instruction, and techniques for evaluating student progress. Readings, lectures, and discussions related to required teaching experience. No credit for students having had 544. CE

557-4 The Elementary Principalship. Designed to meet many of the particular needs of persons interested in qualifying for appointments as elementary school principals. Other than the administrative responsibilities of the elementary principal, such topics as the grouping of pupils, the elementary school's program, and personnel are studied. CE

558-3 to 4 Leadership in Elementary Education. A study of some newer developments in the organization and instruction of the elementary school. Team teaching, a non-graded school, grouping and the impact of newer curricular developments. C

559-4 Workshop in Instructional Leadership. CE

560-4 Kindergarten-Primary 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. C

561-4 The Elementary School Curriculum. A critical study of the reorganization, construction, and administration of the elementary school curriculum, and the installation, adaptation, and administration of the revised curriculum. CE

563-4 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. CE

570-2 to 4 Seminar, Research in Elementary Education. Critical analysis of the most significant research studies in organization, learning, teaching, and curriculum in the elementary education. C

575-2 to 4 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 elementary education, (h) arithmetic, (j) problems in kindergarten-primary, (k) elementary education administration and supervision. CE

596-5 to 9 Independent Investigation. Field study required of each student working for the sixth year professional certificate. The work should be done in the setting of a school system where the student is employed or where full co-operation is extended. The study involves selecting of the problem, survey of pertinent literature, recording of results, and appropriate interpretations and summarizations. C

597-1 to 3, 598-1 to 3, 599-1 to 3 Thesis. Minimum of 5 hours to be counted toward a master's degree. C

600-1 to 48 Dissertation. Minimum of 36 hours for the Ph.D. degree. C

ENGINEERING

401-9 (3,3,3) Principles of Propulsion. (a) The basic principles of propulsion dynamics. (b) The thermodynamics of fluid flow and application to propulsion engines. (c) An extensive treatment of the technological problems in the design of propulsion systems. Must be taken in a,b,c sequence. Prerequisite: 300C. C

406-3 Statistical Mechanics. Introductory subject for graduate engineering students. Classical mechanics of systems of particles and motion in phase space. Quantum mechanical concepts and energy of microscopic systems. Most probable distribution. Determination of thermodynamic properties of gases, crystals, black body radiation field. Fluctuation theory. Application to plasmas, thermionics, masers, cryogenics. Prerequisites: 461, Mathematics 305b. C

412-9 (3,3,3) Engineering Practice. (a) Written communication encountered in engineering organizations: correspondence, memoranda, technical papers, specifications, and reports. Lectures, conferences, and frequent written assignments are adapted to the individual needs of each student. (b) The law of contracts with enough emphasis on legal procedure to enable students to understand decided cases. If possible, the study of the legal material will be followed by practice in applying some of the principles. (c) Research methods. Must be taken in a,b,c sequence. Prerequisite: 361. C

413-6 (3,3) Intermediate Mechanics of Fluids. (a) The dynamics of viscous and compressible fluids. (b) Shock waves, one and two dimensional flow. (c) Boundary layer and shock wave theory. Must be taken in a, b sequence. Prerequisite: 313. C

415-9 (3,3,3) Water Supply and Waste Water Disposal. (See Applied Science 415.) C

423-3 Hybrid Computation. The simultaneous use of the analog and the digital computer for the solution of engineering problems. Scaling of problems. Block diagrams and logic are stressed. Linear and non-linear differential equations. Simulation as well as iterative analog computation are covered. Prerequisites: Applied Science 222 or Mathematics 225. C

439-6 (3,3) Transient Analysis. A study of electrical and mechanical networks by means of the Laplace Transform. Theoretical vibration problems in the real and complex time domain, as they apply to engineering will be discussed. Prerequisites: 335, Mathematics 305b. C

445-9 (3,3,3) Structural Design. (a) General principles of structural design. Probabilities of failure or unserviceability. Factor of safety. Ultimate versus elastic design. Stress control and erection of indeterminate structures. Economics and preliminary planning of structures. Approximate analysis of beams, trusses, frames, and slabs. Preliminary design of indeterminate structures. (b) Consideration of behavior and modes of failure of typical metal structures, structural components, and connections as affected by design features, service conditions, and material properties. Comprehensive review of methods of plastic analysis and design of steel structures. Correlation of buckling behavior of structures and structural members with buckling criteria and requirements. (c) An introduction to the design of reinforced concrete structures, behavior of beams, columns and frames, proportioning of members. Laboratory. Must be taken in a,b,c sequence. Prerequisites: 311, 344. C

446-9 (3,3,3) Mechanical Energy Conversion. (a) Modern power plant cycles, pumps, fans, fuels, steam generator boiler auxiliaries, and heat exchangers. (b) A detailed study of the design and operation of steam turbines. (c) The theory and design of gas turbines and jet engines. Must be taken in a,b,c sequence. Prerequisite: 346. C

461-6 (3,3) Advanced Mechanics. (a) Stress and strain at a point in three dimensions. Introduction to the theory of elasticity with examples of solutions in two dimensions. Consideration of bending of flat plates; energy methods in elasticity; elastic stability problems. (b) The foundation of dynamics leading to Lagrange's equations and Hamilton's principle. Gyroscopic effects in mechanical systems. Analysis of the stability of steady motions. Self-excited vibrations and non-linear vibrations. Must be taken in a,b sequence. Prerequisite: 260. C

462-6 (3,3) Theory of Elasticity. (a) The linear theory of homogeneous, isotropic; elastic media. Analysis of stress and strain. (b) The solution of differential equations of elasticity by numerical inverse, energy, and complex variable methods. Must be taken in a,b sequence. Prerequisite: 461. C

502-9 (3,3,3) Advanced Heat Transfer. (a) The treatment of heat transfer problems involving distributed heat sources in laminar and turbulent shear flow. (b) Discus-

sion of boundary layer temperature distributions in systems with and without heat sources. (c) Discussions of analogies used in convective heat transfer. May be taken in a,b or b,a sequence. Prerequisite: Graduate standing. C

503-9 (3,3,3) Heating and Cooling Systems. (a) The applications of heating and cooling to engineering systems. (b) The design of various systems, including automatic controls. (c) A study of research methods and new concepts in cooling devices. May be taken in any sequence. Prerequisite: graduate standing. C

510-9 (3,3,3) Electromagnetic Fields. Static boundary value problems; conformal transformation; Schwarz-Christoffel transformation; harmonics; application of Maxwell's equations to plane waves in dielectrics and conductors, antennas, and radiation. Prerequisite: consent of instructor. C

511-6 (3,3) Quantum Electronics. An introduction to quantum theory with applications taken from the field of electronics. A study of plasmas, fusion, atomic structure, superconductivity from a theoretical engineering view. Prerequisite: consent of instructor. C

516-4 Water Resources Development. Seminar on engineering problems and economic factors relating to multiple-purpose water resources development. Planning of design features of components for system performance. The integrated use of water from all sources: ground and surface water, waste water, and saline water. Modern trends of large-scale land reclamation, hydropower, tidal power, and pump-storage schemes. Prerequisite: 415. C

517-12 (4,4,4) Analysis and Design of Engineering Systems. (a) Application of general system concepts to wide range of physical and engineering processes. Emphasis on variable flow of matter, energy, entropy, and information directed toward predicting performance for specified designs. Introduction of central theme of functional reticulation into multiported elements. Systematic study of relations and interactions in terms of logical operations, transformations, matrices, ordinary and partial differential equations, signal flow graphs, block and bond diagrams, analogies, and computing systems. Lectures and problem work cover electrical, mechanical, fluid, thermal, chemical, nuclear and biological systems. Prerequisites: Mathematics 305b, Engineering 300, 311, 335. (b) Emphasis on the synthesis and design of systems assembled from multiported primitives to accomplish specific tasks and functions. Particular attention given to the use of analog and digital computers as electronic models for studying alternative designs and modes of operation. Lectures and problems dealing with stochastic processes and variables, in both frequency and time domains, and with stationary and nonstationary parameters. Substantial portion of time allotted to original studies on a team basis using available electronic computers. (c) Advanced engineering systems designs. C

ENGINEERING TECHNOLOGY

412-9 (3,3,3) Engineering Practice. C

437-9 (3,3,3) Industrial Electronics and Communications. Theory of active networks; radio communication, radar, television. Prerequisite: 335. C

ENGLISH

400-4 The Structure of English. An introduction to the methods of descriptive linguistics as applied to English: the phonemics, morphemics, and syntax of English. Recommended for those preparing to teach English. CE

403-4 The 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 English changes. CE

404-8 (4,4) Middle English Literature. (a) Contemporaries and successors of Chaucer: late 14th and early 15th century literature, from *Sir Gawayne and the Grene Knight* to the Scottish Chaucereians, (b) Chaucer. May be taken singly. CE

405-8 (4,4) Descriptive Linguistics. (a) Phonetics and phonemics, an analysis of language structure from phone to phoneme; (b) morphology and syntax, an analysis

- of language structure from morph to sentence, with emphasis on immediate constituent analysis. May be taken singly. Prerequisite: consent of instructor. CE
- 412-12 (4,4,4) English Nondramatic Literature.** (a) 16th century, (b) 17th century, (c) 18th century. May be taken singly. CE
- 417-4 Victorian Literature.** E
- 420-8 (4,4) American Poetry.** (a) Trends in American poetry to 1900 with a critical analysis of the achievement of the more important poets, (b) the more important poets since 1900. May be taken singly. Prerequisite: 309a or 309b. CE
- 421-16 (4,4,4,4) English Poetry.** (a) Early Romantics: major emphasis on general background and on Blake, Coleridge, and Wordsworth; (b) later Romantics: emphasis on Byron, Shelley, and Keats, the minor figures; (c) Victorian poets: Tennyson, Browning, Arnold, and other poets of England, 1830-1900; (d) modern British poets. May be taken singly. CE
- 431-12 (4,4,4) Major American Writers.** Significant writers of fiction and non-fictional prose from the Puritans to the 20th century. (a) 1620-1800, (b) 1800-1865, (c) 1865-1915. May be taken singly. CE
- 438-4 Intellectual Backgrounds of American Literature.** The relationship of basic ideas in America to American literature. Prerequisite: 309a or 309b. CE
- 441-4 The 18th Century Essay.** The informal essay and the literary periodicals—*The Spectator*, *Tatler*, *Guardian*, *Rambler*, *Idler*, and Goldsmith's *Citizen of the World* ("Chinese Letters"). CE
- 443-4 Victorian Prose.** The chief writers of nonfiction prose from the late romantics to 1900. Prerequisite: 302c. CE
- 447-4 American Humor and Satire.** A consideration of the writers and forms of 19th and 20th century humor. CE
- 454-12 (4,4,4) English Fiction.** (a) 18th century: Defoe through Jane Austen, (b) Victorian novel: 1830-1900, (c) 20th century. May be taken singly. CE
- 456-4 Modern Continental Fiction.** Selected major works of European authors such as Mann, Silone, Camus, Kafka, Malraux, Hesse. CE
- 458-8 (4,4) American Fiction.** (a) The novel in America from its beginnings to the early 20th century, (b) trends and techniques in the American novel and short story since 1914. May be taken singly. CE
- 460-16 (4,4,4,4) British Drama.** (a) Elizabethan drama: from the beginning of the drama in late Middle Ages through its flowering in such Elizabethan playwrights as Greene, Peele, Kyd, Marlowe, Heywood, Dekker, but excluding Shakespeare; (b) Jacobean drama: the Jacobean and Caroline playwrights: Jonson, Webster, Marston, Middleton, Beaumont and Fletcher, Massinger, Ford, Shirley; (c) Restoration and 18th century drama: after 1660, representative types of plays from Dryden to Sheridan; (d) modern British drama. May be taken singly. CE
- 464-4 Modern Continental Drama.** The continental drama of Europe since 1870; representative plays of Scandinavia, Russia, Germany, France, Italy, Spain, and Portugal. CE
- 468-4 American Drama.** The rise of the theater in America, with readings of plays, chiefly modern. Prerequisite: 309a or 309b. CE
- 471-8 (4,4) Shakespeare.** (a) The plays before 1600, (b) the plays of 1600 and later. Readings on the life of Shakespeare, the theater, and the acting company. May be taken singly. CE
- 473-4 Milton.** CE
- 485-4 Problems in the Teaching of English.** Aims, methods, materials, tests, programs, and other aspects of English instruction in the high school. CE
- 486-2 to 8 Workshop in High School English.** Intensive study in lectures, laboratory, conferences, to arrive at agreement on the teaching of English in high school. Curriculum, materials, methods, aims. Directed by competent authorities in the field. CE
- 487-2 to 8 Workshop in Junior High School English.** Intensive workshop study in lectures, laboratory, conferences on the teaching of English in junior high school. Curriculum, materials, methods, aims. Directed by competent authorities in the field. E

- 488-9 (3,3,3) Methods of Teaching English as a Foreign Language.** (a) Classroom techniques, (b) laboratory methods, (c) preparation of materials. Restricted to English as a Foreign Language students and must be taken in a,b,c sequence. CE
- 492-8 (4,4) Professional Writing.** Must be taken in a,b sequence. Prerequisite: 392 or consent of instructor. CE
- 495-8 (4,4) Literary Criticism.** (a) History of criticism: ideas and techniques from Aristotle to the end of the 19th century, (b) modern criticism: recent critics and critical attitudes, and practice in writing criticism. CE
- 499-2 to 6 Readings in English.** For English students only. Departmental approval required. No more than four hours may be taken in any one quarter. CE
- 500-2 Materials and Methods of Research in English.** The principal tools of literary scholarship and the more important studies and journals. Practice in the preparation of selective bibliographies and scholarly reports. CE
- 501-4 Old English Grammar.** The development of the forms, the grammar, and readings. CE
- 502-4 Beowulf.** Readings of the poem and study of its form, language, and history. Prerequisite: 501. CE
- 504-4 Advanced English Syntax.** A study of generative grammars. Prerequisite: consent of instructor. CE
- 505-4 Contrastive Linguistic Structures.** A comparison of the structure of English with the structure of a second language. Prerequisite: consent of instructor. CE
- 508-4 or 8 Studies in Chaucer.** Problems in Chaucer, scholarship and criticism. Prerequisite: 404b or consent of instructor. CE
- 509-4 or 8 Studies in Middle English Literature.** At the discretion of the instructor, (a) readings chiefly in Early Middle English with attention to the grammar and phonology of the dialects, (b) a study of Middle English literature exclusive of Chaucer or of one of the more literary types, the scholarship and criticism. CE
- 511-4 or 8 Studies in the Renaissance.** Individual research problems involving the use of primary source materials in extensive microfilm and microcard collections. CE
- 513-4 or 8 Studies in 17th Century Literature.** CE
- 514-4 or 8 Studies in Restoration and 18th Century Literature.** CE
- 519-4 or 8 Studies in Contemporary British Literature.** CE
- 520-4 or 8 Studies in Romantic Writers.** CE
- 521-4 or 8 Studies in Victorian Poetry.** CE
- 524-4 or 8 Studies in the Metaphysical Poets.** CE
- 531-4 or 8 Studies in American Colonial Period.** E
- 532-4 or 8 Studies in American Transcendentalism.** CE
- 534-4 or 8 Studies in Early 19th Century American Writers.** CE
- 536-4 or 8 Studies in Later 19th Century American Writers.** CE
- 537-4 or 8 Studies in 20th Century American Writers.** CE
- 538-4 or 8 Problems in American Literature.** Study of a topic, concept, or idea as it appears in American writing. CE
- 543-4 or 8 Studies in Victorian Nonfiction Prose.** CE
- 555-4 or 8 Studies in the Victorian Novel.** CE
- 560-4 or 8 Studies in Renaissance Drama.** CE
- 566-4 or 8 Studies in Shakespeare.** Detailed study of a limited number of the major plays: historical and technical problems considered in the light of recent scholarship in the field. Prerequisites: 471a or 471b or equivalent. CE
- 569-4 Seminar in Special Problems of English as a Foreign Language.** Independent study in preparing and testing of instructional materials for the teaching of English as a foreign language. Restricted to English as a Foreign Language students. CE
- 579-4 to 16 (4 or 8, 4 or 8) Studies in Modern Literature.** (a) Offered fall quarter, (b) offered winter quarter. CE
- 580-4 Traditional Themes.** Persistent themes and legends in literature—King Arthur, Faust, Utopia, and the like. CE
- 581-12 (4,4,4) Problems in High School English.** (a) Composition, (b) linguistics, (c) literature. CE
- 585-2 to 8 Teaching College Composition.** Objectives, methods, and materials for

- the course; observation; and practice under supervision. CE
- 586-2 to 8 Teaching College Literature. Chief emphasis on freshman and sophomore literature; objectives; methods, materials; observation; and practice under supervision. CE
- 597-2 to 4 Readings in Linguistics. Individual readings in linguistics under the guidance of a staff member. CE
- 598-1 to 9 Independent Review of English and American Literature. CE
- 599-2 to 9 Thesis. CE
- 600-1 to 4S Dissertation. CE

FOOD AND NUTRITION

- 404-4 Personal and Community Nutrition. The role of food and nutrition in personal and community health and in emergency feeding programs. Field trips. Prerequisite: 320 or equivalent. C
- 481-2 to 6 Readings. Supervised readings for qualified students. Prerequisite: consent of instructor and chairman of department. C
- 490-4 Nutrition and Physical Growth. Lectures, readings, and discussion on nutrition in relation to human growth, pregnancy through adolescence, and its practical applications. Prerequisite: 320 or consent of instructor. C
- 500-4 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 trips. Prerequisites: 359 or 356, Guidance 422b (422b may be concurrent), or consent of instructor. C
- 515-1 to 6 Seminar. Staff and student participation in reports and discussion on assigned research papers, research in progress and/or current professional meetings. Recommended for all graduate majors in food and nutrition. Prerequisite: consent of instructor. C
- 556-4 Advanced Experimental Food. Experimental approach to the study of the chemical and physical properties of selected foods; laboratory investigation of a problem in food research and guided work in interpretation of research data. Field trips. Prerequisite: 356 or consent of instructor. C
- 571-4 Recent Research. Review of selected research in various phases of home economics in related fields. Sources of research include colleges, universities, and governmental and industrial agencies. Offered on demand. C
- 572-2 to 8 Special Problems. For students recommended by their chairman and approved by the head of the department and the instructor in charge for independent work or directed study. C
- 580-4 Recent Developments in Nutrition. Critical study of recent scientific literature in nutrition. Prerequisite: 320 or equivalent. C
- 581-4 Recent Trends in Foods. An evaluation of recent literature on food preparation principles and the commercial development of prepared foods for home use. Prerequisite: 335. Offered on demand. C
- 599-5 to 9 Thesis. Minimum of 5 hours to be counted toward a master's degree. C

FOREIGN LANGUAGES

The following courses do not fall within the normal pattern of courses leading to advanced degrees:

- 161-0 French for Graduate Students. C
- 161-0 German for Graduate Students. C
- 161-0 Russian for Graduate Students. C
- 161-0 Spanish for Graduate Students. C

The purpose of these courses is to help graduate students prepare for proficiency examination as requested by the Graduate School for the Ph.D. degree. No prerequisite. Students must register for these courses and are advised to take them as part of it, and not in addition to, their graduate program.

435-4 to 8 Workshop in Elementary School Foreign Language Instruction. Designed to assist elementary school teachers in integrating foreign languages into their teaching program as well as to encourage high school teachers to introduce or supervise foreign languages at the elementary school level. To count as education or foreign languages. Prerequisite: basic language credit. CE

486-8 (4,4) Materials and Methods for Teaching Foreign Languages. Application of language learning principles to classroom procedures at different levels. Theory and practice of the audio-lingual approach, the language lab, applied linguistics. Required for all majors intending to teach foreign languages. Prerequisite: one quarter of any 300-level course, or consent. E

FRENCH

400-4 French Literature Between 1870 and 1914. A survey of French literature from 1870 to 1914. Prerequisite: 313. C

401-6 (3,3) 17th Century French Drama. C

403-3 French Literature of the 18th Century. Drama and Novel. C

405-3 French Contemporary Novel. A study of the novel from 1900 to the present with detailed attention to Proust and Gide. C

406-3 French Poetry from 1850 to 1900. The Parnassian and Symbolist Movements in French poetry. C

407-3 French Poetry Since 1900. A study of French poetry from 1900. C

451-6 (2,2,2) Seminar. Integration of the specialized major courses and the development of a comprehensive view of the major field in terms of its relationship to the growth of Western Civilization. Required of all French senior majors. E

461-4 French Stylistics. Study of writing style in French and its application to the development of skill in written expression. For those who wish to do advanced work in the principles of French grammar and composition. Prerequisite: 9 hours of 300-level courses. E

500-2 Seminar in Contemporary French Literature. *The Roman fleuve* as exemplified in the works of Duhamel, Martin du Gard, and Romains. CE

501-2 to 10 Seminar on a Selected French Author. Intensive study of one author—his life, his work, and his place in the literary and cultural developments of civilization. (a) Balzac, (b) Baudelaire, (c) Moliere, (d) Montaigne, (e) Proust. CE

502-3 French Literature from *La Chanson de Roland* to Rabelais. French literature from the early epic to Rabelais. C

503-3 Rabelais and Montaigne. A study of the works of Rabelais and Montaigne. C

504-3 La Pléiade. The development of lyric poetry in the Renaissance. C

507-3 A Study of Romanticism in France. C

510-4 French Literature from 1850 to 1900. C

511-3 20th Century French Drama. French drama from 1900 to the present. C

515-3 Old French. Readings from the *Chanson de Roland* and the prose chronicles. Prerequisite: 410 or equivalent. C

520-4 Graduate Composition and Diction. Composition based on study of contemporary French authors; individual work in pronunciation and diction determined by entrance tests. C

543-2 to 6 Research Problems. Individual research on a literary or linguistic problem involving original investigation in areas not covered by seminars or thesis. C

544-6 French Language and Culture. Daily lecture in French on selected aspects of French culture, followed by daily classes in the development of audio-lingual skills through cultural content, followed in turn by daily classes in reading and writing. Prerequisite: the bachelor's degree with emphasis in foreign languages. E

545-3 Applied Linguistics and Remedial Phonetics. Fundamentals of linguistics with particular reference to their application to classroom procedures in the teaching of French, plus the analysis and correction of individual pronunciation difficulties. Prerequisite: the bachelor's degree with emphasis in foreign languages. E

546-3 Professional Preparation. Principles and practice of teaching foreign languages. Analysis of current trends and methods. Effective use of modern materials and techniques in the foreign language classroom. Visual aids, the language laboratory, text-

books, testing, organization of foreign language courses on various levels. Prerequisite: the bachelor's degree with emphasis in foreign languages. E
599-2 to 9 Thesis. Minimum of 5 hours to be counted toward a master's degree. C

GERMAN

Language and Literature

- 401-4 (2,2) **Goethe's Faust.** (a) the Faust legend and early Faust books and plays; the genesis of Goethe's *Faust*: reading of Part I. (b) reading of Part II; study of symbolism such as blending of paganism with Christianity, ancient Greek culture with Germanic culture. Must be taken in a,b sequence. CE
- 403-3 **German Ballads and Lyrics.** A selective study of the foremost examples of German balladry and lyric poetry, ranging from the poetry of Klopstock and Bürger to that of Hesse, Benn, etc. Lectures, recitations. C
- 404-4 **Weimar and Its Aftermath.** German writings from the inception of the Weimar Republic to the end of W.W. II, with special reference to the correlation existing between literary expression and social, economic and political conditions. C
- 406-3 **The German Comedy.** Comic and satirical works in German Literature, with special emphasis on the "Lustspiel" since 1800; lectures, reports. C
- 407-2 **Great German Plays of the 20th Century.** Study and selective readings of outstanding stage successes; lectures, reports. C
- 408-4 **German Civilization.** Intensive study of the German speaking areas of the world, with emphasis on the anthropological and sociological aspects of their respective cultures (Austrian, German, Swiss, "Reichs-deutsch," etc.); lectures, reports. C
- 411-6 (3,3) **Middle High German.** (a) Grammar, and selective readings in both MHG originals and NHG translations of such epics as the Nibelungenlied and Gudrun. (b) The courtly epic poetry of such authors as Wolfram von Eschenbach, Gottfried von Strassburg, Hartmann von Aue, the lyric poetry of Walther von der Vogelweide, and didactic prose. C
- 451-6 (2,2,2) **Seminar.** Integration of the specialized major courses and the development of a comprehensive view of the major field in terms of its relationship to the growth of Western Civilization. E
- 497-1 to 2 **Readings in 18th Century German Literature.** Departmental approval required. C
- 498-1 to 2 **Readings in 19th Century German Literature.** Departmental approval required. C
- 499-1 to 2 **Readings in 20th Century German Literature.** Departmental approval required. C
- 500-2 **Seminar in Contemporary Literature.** Intensive study of the works of representative German authors, with special reference to the correlation existing between literary expression and social, economic, and political conditions since 1900. Lectures, outside readings, reports. C
- 501-2 **Seminar on a Selected German Author.** Intensive study of one author—his life, his work, and his place in the literary and cultural development of civilization. Lectures, outside readings, reports. C
- 509-4 (2,2) **Old High German.** (a) Phonology, morphology, etymology, syntax. (b) Continued study of grammar and readings of Franconian Bavarian, and Alemannic texts. C
- 511-3 to 9 **Thesis or Research in German Literature.** For students who are writing a thesis or making advanced graduate study of some phase of German literature. Lectures, compilation of bibliographies, other research techniques, papers. 2 to 4 hours each (maximum of 9 hours). C
- 512-3 **19th Century German Novel.** German literature from the decline of Romanticism to the end of the century. A study of trends and representative works of such authors as Keller, Fontane, Raabe, etc. Lectures, reports. C
- 513-3 **20th Century German Novel.** Continuation of 512. Study of representative writers of expressionism, "Neue Sachlichkeit," etc. Lectures, reports. C
- 514-3 **Seminar in Folklore.** Study of German folk literature, with emphasis on folk

tales (such as Grimms' Household Tales, regional sagas, etc.), chapbooks (such as Dr. Faust, Till Eulenspiegel, etc.), folksongs (Des Knaben Wunderhorn), and folk drama. Lectures, reports. C

543-2 to 6 Research Problems. Individual research on a literary or linguistic problem involving original investigation in areas not covered by seminars or thesis. C

544-9 NDEA German Institute. Summer Institute for Teachers of German. C

591-2 to 6 Seminar on Kant. A selective study of the works of Immanuel Kant, with special emphasis on the influence exerted by Kantian philosophy on subsequent German literature. Course counted on a major in philosophy, subject to the consent of the Department of Philosophy. Lectures, outside readings, reports. C

RUSSIAN

Language and Literature

414-3 Russian Poetry from Zhukovsky to 1920. A study of Russian Poetry from Sentimentalism through Symbolism. C

425-3 Soviet Literature. A study of satirists and writers of everyday life. Constructivism and followers; Soviet literary criticism. Lectures, readings, and reports. C

452-4 Advanced Composition and Conversation. Oral and written composition of a practical nature for advanced students; emphasis on study of idiomatic expressions and current usage. C

509-3 Russian Literature of the 17th Century. A study of early Russian literature with emphasis on literature of the Kievan period. Analysis of texts and reports. C

510-3 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. C

514-4 (2,2) 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. C

520-4 Russian Linguistic Structure. A structural analysis of present-day Russian with special attention to Russian syntax. Free composition on Russian authors. C

543-2 to 6 Research Problems. Individual research on a literary or linguistic problem involving original investigation in areas not covered by seminars or thesis. C

SPANISH

(Iberian)

401-3 Spanish Novel of the 19th Century. Study of representative novels of Fernán Caballero, Valera, Pereda, Galdós, etc. C

402-3 Spanish Drama of the 18th and 19th Centuries. Reading of representative plays of the chief dramatists from Moratin to the Generation of 1898. C

403-3 Spanish Poetry. General survey of Spanish poetry from its beginnings to 1900. C

404-3 Spanish Literature of the 20th Century: Novel and Essay. Main trends of the Spanish novel and essay since 1900. C

415-3 Spanish Phonetics. Analysis of the sounds of Spanish and their manner of production; intonation; levels of speech; oral practice. C

440-6 (3,3) The Golden Age: Drama. Plays of Lope de Vega, Calderón, Tirso de Molina, Ruiz de Alarcón, and others. C

445-4 Cervantes. Don Quixote; Other works assigned as collateral readings. C

461-4 Spanish Stylistics. Study of writing style in Spanish and its application to the development of skill in written expression. For those who wish to do advanced work in the principles of Spanish grammar and composition. Prerequisite: 9 hours of 300-level courses. E

501-2 Seminar on a Selected Spanish Author. Study of one author—his life, his works, and his relationships to the literary and social currents of his time. C

505-3 The Picaresque Novel. Study of the *Lazarillo*, with collateral readings of other masterpieces of this genre. C

506-3 The Renaissance. Literature of the Renaissance in Spain, including the drama, the novel, the lyric poetry, and the histories of the Indies. C

- 515-3 Old Spanish. *Poema de mio Cid* and other medieval writings in Spanish. Prerequisite: 410 or equivalent. C
- 520-3 Seminar in Syntax. Stylistics and grammatical analysis. C
- 525-3 The Spanish Ballads. The *romance* studied as a part of the literature and folklore of Spain and the New World. C
- 543-2 to 6 Research Problems. Individual research on a literary or linguistic problem involving original investigation in areas not covered by seminars or thesis. C
- 599-2 to 9 Thesis. Minimum of 5 hours to be counted toward a master's degree. C

SPANISH

(American)

- 421-3 Survey of Modernism in Spanish American Poetry. Study of its origins, characteristics and achievements. C
- 422-3 Contemporary Spanish American Poetry. Spanish American poetry since modernism. C
- 423-3 to 4 The Mexican Novel of the 20th Century. Emphasis on fiction dealing with the Revolution and related social problems. C
- 424-3 to 4 Gaucho Literature. Study of the Gaucho as a social class and of the types of literature developed to portray and symbolize his way of life, attitudes and values. C
- 426-3 The Mexican Short Story. Survey of the Mexican short story from pre-Conquest to the present. C
- 427-3 Spanish American Drama. Study of representative works of Florencio Sánchez, Rodolfo Usigli, Armando Moock, Samuel Eichelbaum, Xavier Villarrutia, and others. C
- 451-6 (2,2,2) Seminar. Integration of the specialized major courses and the development of a comprehensive view of the major field in terms of its relationship to the growth of Western Civilization. E
- 478-4 Seminar in Latin American Thought. (See Philosophy 478.) C
- 500-2 Seminar in Latin American Fiction. The works of a specific novelist or group of novels on a similar theme studied as a reflection of social and cultural conditions in a country or geographical area. C
- 535-3 Mexican Essayists of the 19th Century. Currents of Mexican thought in the 19th century. C
- 538-3 Seminar on Spanish American Poetry. Study of the works of a single poet, of a group of poets or of literary trends or movements such as *creacionismo*, *ultraísmo*, etc. C
- 541-3 Seminar on Spanish American Literary Criticism. Significant documents of literary criticism from Independence to the present. C
- 543-2 to 6 Research Problems. (See Spanish—Iberian.) C
- 599-2 to 9 Thesis. C

ROMANCE PHILOLOGY

- 410-4 Romance Philology I. Survey of phonology, morphology, and syntax changes in Romance languages in general; special attention to the developments in French and Spanish for majors in these fields. C
- 514-4 Romance Philology II. Studies in syntax of Old French and Old Spanish. Continued. C
- 516-4 Arthurian Romance. Readings in the Arthurian Romances of the student's major interest (French or Spanish) with reference to the genre as a whole. Prerequisite: 410 or equivalent. C

FORESTRY

- 410-3 Forest Management for Wildlife. Interrelations between forest practices and game. Forest protection from mammals and birds. Emphasis is on treatment of the forest. Prerequisite: Zoology 463, forestry major or consent of instructor. C
- 440-4 Ecology of Grasses and Grasslands. (Same as Botany 440.) Structure, anal-

ysis and dynamics of grassland communities; structure and growth of individual species. Prerequisite: GSA 340 or consent of instructor. C

450-4 Forest and Park Administration. Fundamentals of management and administration of recreation forests. Development of forest and suburban parks under a forest environment. Review of current local, state, and Federal legislation applicable to forest recreation. C

464-4 Advanced Silviculture. Analysis and measurement of site quality; stand density; growth as related to site factors and competition; factors affecting reproduction; the tree as a variable. Prerequisites: 365a,b. C

465-2 Forestry Field Studies. An extended trip to study forest conditions and silviculture in different forest regions of the United States. Cost shared by students. Prerequisites: 330, 363a, 365a. C

466-3 Forest Watershed Management. Effects of treatment of forested watersheds on quality and quantity of water yield. Consideration of alternative in water use and flood control. Prerequisites: Plant Industries 301, GSA 330, or consent of instructor. C

470-8 (4,4) Economics of Forestry. (a) Introduction to forest economics; forestry production and investment. Prerequisite: GSB 211a. (b) Forestry marketing, macroeconomics and planning. Prerequisite: 470a or consent of instructor. C

471-4 Land Resource Economics. (See Economics 471.)

476-3 Cases in Forest Management. A series of case studies analyzing governmental and industrial forest management plans and the objectives of forest management by top level management. C

520a-1 to 6 Readings in Forestry. Directed readings in selected subjects. C

520b-1 to 6 Readings in Resource Economics. (See Economics 502.) C

570-3 Principles of Research. Research philosophy, approaches to research; theory, hypotheses, inference and prediction; problem identification, project development and organization; methods of data collection, analysis and presentation; drawing conclusions and organizing results. Prerequisite: 4 hours in statistical methods, or consent of instructor. C

575-1 to 6 Research. Directed research in selected fields of forestry. C

581-1 to 6 Seminar. Study and discussion of forestry problems. C

599-2 to 9 Thesis. Minimum of 5 hours to be counted toward a master's degree. C

GEOGRAPHY

402-7 (4,3) Advanced Physical Geography I. Deals with one or more of the following land forms, climate, soil, and water; 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: 302 or consent. CE

403-7 (4,3) Advanced Physical Geography II. Content drawn from same broad range of topics as 402. To be alternated with 402 to enable student to specialize further in physical geography. Prerequisite: 302 or consent. CE

404-7 (4,3) Advanced Economic Geography I. Deals with one or more of the following: transportation, manufacturing, agriculture, resources, trade and urban geography; depending on, and varying with, interests of 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: 302 or consent. CE

405-7 (4,3) Advanced Economic Geography II. Content drawn from same broad range of topics as 404. To be alternated with 404 to enable student to specialize further in economic geography. Prerequisite: 302 or consent. CE

406-7 (4,3) Advanced Cultural Geography I. 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. CE

407-7 (4,3) Advanced Cultural Geography II. Content drawn from same broad range of topics as 406. To be alternated with 406 to enable student to specialize further in cultural geography. Prerequisite: 302 or consent. CE

410-8 (4,4) Advanced Geographic Techniques. Geographic applications of cartographic and quantitative research techniques. Prerequisite: 310 or consent of instructor. CE

416-8 (4,4) Cartography (C); 416-6 (3,3) Advanced Cartography (E). Instruction and practice in the techniques of map-making and problems in map reproduction. Laboratory. Prerequisite: 310. CE

417-3 Air Photo Interpretation. Techniques in the use of air photos as source material for research in physical and social sciences. Prerequisite: 310. CE

424-4 Regional Problems in Conservation. The distribution, use, and interrelationship of the resources of the U.S. and the conservation techniques applied to them. E
440-2 to 6 Reading for Majors. Supervised readings in selected subjects. Prerequisite: advanced standing. C

450-3 to 15 Travel Study Course. Enrichment through travel, supervised study, and readings on areas visited. E

461-7 (4,3) Advanced Regional Geography: Anglo-America. Deals geographically with present-day United States and Canada. (a) A general survey of the area, open to non-majors. (b) Investigates specific topics in depth, for majors. CE

462-7 (4,3) Advanced Regional Geography: Europe. See 461. CE

463-7 (4,3) Advanced Regional Geography: Mediterranean Lands and Southwestern Asia. See 461. CE

464-7 (4,3) Advanced Regional Geography: Soviet World. See 461. CE

465-7 (4,3) Advanced Regional Geography: Sub-Saharan Africa. See 461. CE

466-7 (4,3) Advanced Regional Geography: Eastern and Southern Asia. See 461. CE

467-7 (4,3) Advanced Regional Geography: Latin America. See 461. CE

468-7 (4,3) Advanced Regional Geography: Oceania. See 461. CE

470-12 (4,4,4) Urban Planning (C). (Same as Government 470.) The basic problems of planning in the urban community. Includes the administrative and physical principles involved in the planning of urban land use. Emphasis is upon research technics, design principles, and governmental instrumentalities in the planning process. Prerequisite: consent of instructor. **470-18 to 22 (4,4,4,2,4 to 8) Urban Planning (E).** (Same as Government 470.) (a) Planning concepts and methods, (b) planning administration and the planning function in public process, (c) field problems, (d) urban planning seminar: Planning in a Free Society, (e) planning and public administration internship. Parts *c* and *d* may be taken concurrently. CE

471-7 (4,4) Regional Planning (C). Examination of the viewpoint, methods, and techniques of regional planning. Prerequisite: consent of instructor. **471-3 to 6 Regional Planning (E).** Area and regional development, theory, and practices. CE

475-4 to 8 Methods of Field Geography. Application of geographic field techniques. E

480-4 Workshop in the Teaching of Geography. Gives the geographic approach to man in space. Skills, techniques in the use of maps, globes, pictures, statistics and graphics, and reading the landscape and literature will be acquired. C

490-3 (1,1,1) Tutorial in Geography (C); 490-6 (2,2,2) Tutorial in Geography (E). Individual and small group conferences with staff members to examine geographic concepts. CE

500-4 Geographic Techniques I. Emphasizes field and quantitative techniques used in geography. CE

501-4 Geographic Techniques II. Emphasizes the conceptual framework of geography, library and bibliographic techniques, and geographic writing. CE

511-4 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. CE

514-2 Teaching of College Geography. C

515-4 to 6 Field Course. Designed to give actual experience in the field. Under guidance of staff members students will gather data and work toward the solution of selected field problems in one particular region of the world. This course will not be offered on campus, but will be in a field camp location suited to the study of selected problems. Prerequisite: master's degree or 500 and 501. C

520-2 to 8 Seminar in Physical Geography. C

521-2 to 8 Seminar in Economic Geography. CE

522-2 to 12 Seminar in Regional Geography. CE

523-4 Seminar in Cartography. CE

524-2 to 8 Seminar in Cultural Geography. CE

527-2 to 8 Seminar in Urban and Regional Planning. C

530-2 to 10 Independent Studies in Geography. CE

540a-2 to 12 Research in Physical Geography. C

540b-2 to 12 Research in Economic Geography. C

540c-2 to 12 Research in Regional Geography. C

540d-2 to 12 Research in Cultural Geography. C

599-2 to 9 Thesis. Minimum of 5 hours to be counted toward a master's degree. CE

GEOLOGY

405-3 Geologic Interpretation of Maps and Air Photos. Interpretation and use of air photos in geologic mapping; interpretation and construction of geologic maps, such as areal, structure, isopach, paleogeologic. Laboratory. Prerequisite: 221, 302, 431. C

410-4 Stratigraphy and Sedimentation. The characteristic features of sedimentary rocks and their processes of origin; the classification of stratigraphic units, methods of correlation, and paleogeologic reconstruction. Laboratory. Prerequisite: 220, 221. C

414-5 Paleobotany. (See Botany 414.) C

415-4 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. Laboratory. Prerequisites: 310, Physics 208. C

416-4 X-Ray Crystallography. 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. Prerequisites: 310, Mathematics 150. C

420-9 (3,3,3) Geology of Petroleum. 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. Laboratory. Prerequisites: 221, 302. C

425-13 (5,4,4) Paleontology. (a) a survey of the important invertebrate phyla and their fossil representatives; (b) the mollusca, arthropoda, brachiopoda, and echinodermata; (c) the protozoa, porifera, coelenterata, bryozoa, and other minor groups. Includes classification, evolution, paleoecology, and geographic and stratigraphic distribution. Laboratory. Prerequisites: 221, Biology 201. C

430-4 Physiographic Provinces of North America. Gives the student an intelligent appreciation of the evolution of land forms in the physiographic provinces of North America and explains the surface features in a landscape. Prerequisite: 220. C

431-4 Geomorphology. A study of land forms, relating topographic features to the underlying rocks and structure and to processes of erosion, deposition, and earth movements. Prerequisite: 220. C

440-1 to 4 Independent Study. Prerequisites: 220, 221, advanced standing. C

450-9 Field Geology. A field mapping course including problems in stratigraphy, structure, paleontology, physiography, and economic geology. Requires a written geologic report. Consult the department for dates, cost, and equipment. Students will live at the Little Grassy Lake campus. Prerequisite: 302. C

- 450B-3 Advanced Field Geology.** C
- 510-9 (3,3,3) Stratigraphy.** (Paleozoic, Mesozoic, Cenozoic.) Character, chronologic sequence, correlation, time relations, facies, analysis and comparison of rock and bio-stratigraphic units of selected regions throughout the world with emphasis on North America. Laboratory problems involving stratigraphic interpretation from maps, construction of stratigraphic sections, facies maps, and faunal analysis. Field trip and written report required. 2 lectures, 1 laboratory. Prerequisites: 302, 425, 426. C
- 515-12 (4,4,4) Mineral Deposits.** (Principles, Metallics, Non-metallics.) Principles of mineral deposition and genesis, and the origins and geologic settings of the important mineral deposits of the world. Laboratory. Prerequisites: 302, 310. C
- 520-12 (4,4,4) Advanced Petrology.** (a) Igneous Petrology. Physical chemistry, petrographic classification, and genetic relationships of the igneous rocks. (b) Metamorphic Petrology. Physical chemistry, petrographic classification, and genetic relationships of the metamorphic rocks. (c) Sedimentary Petrology. Petrographic classification and origin of sedimentary rocks. Prerequisites: 310, 415, or equivalent. C
- 528-3 Introduction to Micropaleontology.** The study of Foraminifera and Ostracoda is emphasized, but a survey of microscopic fossil organisms and skeletal elements of megafossils is included. Laboratory work in techniques of collection and preparation and methods of study of microfossils. Prerequisite: 426. C
- 540-1 to 9 Advanced Studies.** C
- 541-1 to 9 Research.** C
- 599-2 to 9 Thesis.** Minimum of 5 hours to be counted toward a master's degree. C

GOVERNMENT

- 406-4 The American Chief Executive: President and Governor.** A study of the origin and background of the presidency and the governorship, qualifications, nomination and election, succession and removal, the organization of the executive branch, and the powers and functions of the president and governor. Prerequisites: 231, 232 (C); 210 or equivalent (E). CE
- 410-3 Labor and Politics.** A political history of the American labor movement from its early century origins to the present. Attention given to the political philosophy and practice of labor unions. Prerequisite: 231. C
- 415-3 Political Behavior.** An analysis of the nature of public opinion and methods of influencing political behavior. Major attention given to studying the basic psychological attitudes and behavior. Prerequisite: 231 (C); 210 or equivalent (E). CE
- 420-3 Pressure Groups and Politics.** An analysis of interest groups and their techniques of political propaganda. Prerequisite: 231 (C); 210 or equivalent (E). CE
- 430-3 Government and National Security.** A study of the organization of government for national security; the historical and current developments in civil-military relations; the legal status of over-seas military aid programs; international defense programs; and the problem of disarmament. Prerequisite: 231 or consent of instructor. C
- 432-3 Government and Natural Resources.** A study of the administrative and policy problems in the development of multiple purpose conservation programs by the national government. Prerequisite: 231 or consent of instructor. C
- 434-3 Government and Agriculture.** An historical and contemporary survey of the role of agriculture in politics, the major and minor farm parties and pressure groups, the elements of the current "farm problem," and the influence of agriculture in public agencies and the formation of public policy. Prerequisite: 231. C
- 435-4 Government and Business.** An historical study, with contemporary emphasis upon relations between government and economic institutions. Prerequisite: 231 or consent of instructor (C); 210 or equivalent (E). CE
- 436-3 Government and Labor.** (See Economics 436.) C
- 438-4 Social Welfare Legislation.** 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. Prerequisite: consent of instructor. C
- 440-4 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: 210 or equivalent (Edwardsville), 360 (Carbondale). CE
- 441-4 Philosophy of Government.** (See Philosophy 441.) C
- 451-3 International Politics of Europe.** E
- 452-4 Governments and Politics of Sub-Sahara Africa.** A study of the governments and politics of the former and present British and French territories: Ghana, Nigeria, Kenya, Guinea, Congo, Senegal, etc. Prerequisite: GSB 390 or consent of instructor. C
- 453-12 (4,4,4) Soviet Russia and the Communist States of Eastern Europe (C);**
453-12 (4,4,4) The Government and Politics of the Soviet Union (E). An intensive study and research exercise in communist government and politics. Prerequisite: GSB 390 or consent of instructor. CE
- 454-8 Development of German Democracy.** Offered co-operatively by Southern Illinois University and the University of Hamburg. Involves a summer's residence in Hamburg, Germany, and study under professors of the two co-operating universities. Prerequisite: consent of the American professor. C
- 455-4 Major Governments of Western and Central Europe.** A comparative study of the political systems of the major countries of Western and central Europe. Prerequisite: GSB 390 or consent of instructor. CE
- 456-4 Great Britain and the British Empire.** A survey of the governmental institutions and practices within the British Empire, with particular attention to the political systems of Australia, Canada, and South Africa. (The governments of India and Pakistan are treated in 458.) Prerequisite: GSB 390 or consent of instructor. CE
- 457-8 (4,4) Government and Politics in the Near and Middle East.** Iran, Iraq, Syria, Lebanon, Egypt, Jordan, Saudi Arabia, etc. Prerequisite: GSB 390 or consent of instructor (C); 210 or equivalent (E). CE
- 458-12 (4,4,4) Government and Politics of Asia.** (a) Burma, Thailand, Mayala, Indochina, Indonesia, Philippines. (b) China, Japan, Korea, Formosa. (c) India, Pakistan, Ceylon. Prerequisite: GSB 390 or consent of instructor. CE
- 461-4 Organizational Theory and Public Administration.** Analysis of various theoretical approaches to public administration with emphasis on recent American literature in this field. Prerequisite: 360 or consent of instructor (C); 360 or concurrent (E). CE
- 462-3 Administrative Organization.** A survey of the reorganization movement as a whole in the United States with emphasis on recent national, state, and local developments. Prerequisite: 360 or consent of instructor. C
- 463-3 Government, Social, and Economic Policy.** Exploration of contemporary agencies of policy determination within the national government; attention to methods and devices utilized to effectuate national social and economic policy within the federal system; appraisal of historical developments, trends, and results as they affect American governmental, constitutional, and political philosophy, public administration, and the general welfare. Prerequisite: GSB 211c or consent of instructor. C
- 464-3 Regulatory Administration.** A study of the work of the major regulatory commissions of the national government. Prerequisite: 360 or consent of instructor. C
- 465-3 Local Government and Public Administration.** Problems and issues at local governmental level. Emphasizes administrative approaches, special problems in inter-governmental relationships, and the developing tasks related to urban expansion. Prerequisite: 360. E
- 466-3 State Government and Administration.** Leading problems of government and administration of American states. Prerequisite: 232. C
- 467-4 Municipal Government and Administration.** Development and functioning of city government in the U.S. Prerequisite: 232. C

- 468-3 County Government in the United States.** An examination of the traditional rural county and township, the growing number of metropolitan counties, and the associated growth of special districts in the U.S. Prerequisite: 232. C
- 469-3 Administration of State and Local Finance.** An examination of the administrative problems connected with local and state revenues and expenditures in the U.S. Prerequisite: 232. C
- 470 Urban Planning.** (See Geography 470.) CE
- 471-4 The Organization and Administration of American Foreign Policy.** An advanced course dealing with the organizational and administrative aspects of American foreign policy. Prerequisite: 243 or 371. C
- 472-4 International Organization.** Development and organization of international governmental and administrative systems, with emphasis on the United Nations. Prerequisite: GSB 303. C
- 473-3 Metropolitan Studies and Research.** Examination of the reorganization movement related to improvement and restructuring of government in metropolitan areas. Review and evaluation of special problems in research methodology. Prerequisite: 360 or 465 or consent of instructor. E
- 475-8 (4,4) International Law.** Rules and practices governing the nations in their relations in peace and war. Prerequisite: GSB 303 C
- 478-4 International Politics.** A study of the interplay of political forces in the international community. Particular emphasis will be placed on war-time diplomacy, peace treaties, the alignments and conflicts of power in the post-war period. Prerequisite: GSB 303 or consent of instructor. C
- 480-4 The Pacific and the Far East.** Political and strategic problems in this area. Prerequisite: GSB 303 or History 370. C
- 484-8 (4,4) History of Political Theories.** (a) Outstanding political theories of the ancient and medieval periods, including theories of Aristotle, Plato, Cicero, St. Augustine, and Thomas Aquinas. (b) Important political theories from the Renaissance to the end of the 18th century, including the theories of Machiavelli, Hobbes, Rousseau, Locke, and Burke. Prerequisite: 6 hours of government. CE
- 485-4 Renaissance and Rationalist Political Theories.** C
- 487-6 (3,3) American Political Ideas.** An historical study of the political ideas of leading American statesmen and publicists, and their resulting influence upon our governmental system. Prerequisite: 305 or GSB 385. CE
- 488-12 (4,4,4) Recent Political Theory.** (a) The outstanding Anglo-American liberal political theorists from John Stuart Mill to the present. (b) The outstanding "scientific" political theorists from Karl Marx to the present. (c) The outstanding idealistic and nationalistic political theorists from Hegel to the present. Prerequisite: GSB 385 or 390. C
- 495-8 (4,4) Constitutional Law.** (a) Constitutional law of the United States with emphasis upon cases dealing with the framework of our federal system. (b) American liberties. Prerequisite: 231. CE
- 497-4 Administrative Law.** Law as it affects public officials in carrying out the rights, duties, and necessary functions of the public office. Prerequisite: 360. C
- 498-4 Jurisprudence.** (Theories of Law.) Major schools in legal thinking. Positive law and natural law. Idea of justice and concept of natural rights. Prerequisite: 231. C
- 499-4 Scope and Method of Government.** Practical training in research and writing techniques in the field of government. Bibliographical materials, footnotes, use of law library facilities, and government documents. Required of all beginning graduate students. C
- 501-525 Seminars.** Preparation and presentation, for criticism, of assigned research papers. Hours of credit as announced. C
- 501-2 to 9 Seminar in Contemporary Legislation.** Prerequisite: 340 or consent of instructor. C
- 502-2 to 9 Seminar in Governmental Problems.** Prerequisite: consent of instructor. C

- 503-2 to 9 Seminar in Pressure Groups. Prerequisite: 420 or consent of instructor. C
- 505-2 to 9 Seminar in Political Parties. Prerequisites: 380, 420, or consent of instructor. CE
- 508-2 to 9 Seminar in International Relations. Prerequisites: 370, 472 or 475, or consent of instructor. C
- 509-2 to 9 Seminar in International Organization. Prerequisite: 472 or consent of instructor. C
- 510-2 to 9 Seminar in State Government. Prerequisite: 466 or consent of instructor. C
- 511-2 to 9 Seminar in Local Government. Prerequisite: 467 or consent of instructor. C
- 512-2 to 9 Seminar in Public Administration. Prerequisite: 360 or consent of instructor. CE
- 513-2 to 9 Seminar in Constitutional Law. Prerequisite: 395 or consent of instructor. C
- 515-2 to 9 Seminar in Comparative Constitutions. C
- 516-2 to 9 Seminar in Municipal Administration. Prerequisite: 467 or consent of instructor. C
- 517-2 to 9 Seminar in Problems in Political Theory. Prerequisite: 360 or consent of instructor. C
- 520-2 to 9 Seminar in American Foreign Policy. Prerequisite: 371 or consent of instructor. C
- 521-1 to 12 Readings. Supervised readings in selected subjects. Not more than 6 hours may apply toward the master's degree. Prerequisite: consent of instructor. C
- 525-2 to 9 Seminar in International Law. Prerequisite: 475 or consent of instructor. C
- 526-2 to 9 Seminar in County Government. Prerequisite: 465 or consent of instructor. C
- 530-4 to 12 Internship in Public Affairs. Field work 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. CE
- 595-2 to 12 Individual Research. Selection, investigation, and writing of a research topic under the personal supervision of a member of the departmental graduate staff. Prerequisite: 499 or consent of instructor. C
- 598-1 Teaching Government. C
- 599-2 to 9 Thesis. Prerequisite: 499 or consent of instructor. Minimum of 5 hours to be counted toward a degree. C
- 600-1 to 48 Dissertation. Minimum of 36 hours to be earned for the Ph.D. degree. C

GUIDANCE

- 412-4 Mental Hygiene. A survey of principles concerning factors and conditions in personal life that tend to facilitate or deter mental health. Mental health viewed as living creatively in an atmosphere of satisfactory inter-personal relations. Prerequisite: 305. CE
- 420-4 Educational Statistics. The statistics needed by teachers for classroom use, the reading of educational literature, and informal educational research. Includes methods of organizing and presenting data, describing group performance, describing individual performance, model distributions, measure of relationship, measures of reliability, and tests of significance. Prerequisite: 305. E
- 422-12 (4,4,4) Educational Measurement and Statistics. (a) Study of the philos-

ophy and techniques of measurement. Special attention to the construction and use of teacher-made tests. (b) The statistics needed by teachers for classroom use, the reading of educational literature, and informal educational research. (c) Study of standardized tests and other measuring devices to reveal individual and group characteristics. Emphasizes application and interpretation for counseling, education, and research purposes. Must be taken in a,b,c sequence. Prerequisite: 305. C

422-4 Educational Measurements I. Study of the philosophy and techniques of measurement. Special attention to the construction and use of teacher-made tests. Prerequisite: 305. E

426-4 Individual Inventory. Principles and procedures for studying individual pupils and their problems, for guidance purposes. Emphasis on interview, observation, ratings, case study, cumulative record, etc. Prerequisites: 422b, 442. CE

442-4 Basic Principles of Guidance. Introductory course on student personnel services. Survey of philosophy, principles, and organization of guidance services. Prerequisite: 305. C

475-4 Implementation of Guidance Principles in the Public Schools. C

481-1 to 6 Seminar. Conducted by staff members and/or distinguished guest lecturers on pertinent topics. Prerequisite: 305. C

483-6 Community Programs for the Prevention of Juvenile Delinquency. Analysis of delinquency prevention in community programs administered by the public schools, social welfare, governmental agencies. A study of the various categories of juvenile delinquency is applied to a critique of existing programs and to the development of experimental programs. The roles of professional workers pertinent to such programs is delineated with special reference to the public school administration, counselor, the social workers, the court, probation officers, and police. Prerequisite: consent of instructor. E

485-4 to 9 Workshop in Educational Utilization of Community Resources. CE

501a-2 to 8 Special Research Problems. For majors in Guidance. Formulating, investigating, and reporting on a problem in the area of guidance. Prerequisite: Advanced standing and consent of department. E

501-2 to 6 Special Research Problems. C

502-4 Measurement and Evaluation of Products and Procedures. C

503-4 Tests and Measurements in Business Education. C

511-4 Educational Implications of Learning Theories. Survey of the major theories of learning. Emphasizes the implications of these theories for classroom practice. Prerequisite: advanced standing. CE

515-4 Psychological Aspects of Education. Designed to survey the applications of psychology to educational settings. Prerequisite: advanced standing. CE

520-8 (4,4) Educational Statistics and Experimental Design. (a) Statistical methods needed for educational research. Includes reliability of statistics, tests of significance, nonparametrics, correlation analysis, and test selection. Prerequisite: 422b. (b) Systems of organizing and analyzing data so that maximum information can be obtained. Includes analysis of variance, factorial design, square designs, mixed designs, tests of homogeneity, analysis of covariance, etc. Must be taken in a,b sequence. Prerequisite: 422b. C

520-4 Advanced Educational Statistics. E

522-4 Educational Measurements II. Study of standardized tests and other measuring devices to reveal individual and group characteristics. Emphasizes application and interpretation for counseling, education, and research purposes. Prerequisite: 420, 422. E

525-4 School Behavior Problems and Their Prevention. A survey of the approaches to the study of personality-development and socialization of the school child. Methods used in the correction of behavior problems are considered. Prerequisite: consent of department. CE

526-4 Techniques in Individual Guidance. Each student employs psychometric procedures, makes observations, and holds interviews with a pupil, his parents, teachers, and others. The student will work with one pupil only throughout the quarter. Prerequisite: 525. CE

528-4 Advanced Guidance of the Individual. A continuation of 526. Techniques and the methods of treatment which would apply to a particular case. Problems for consideration: educational difficulties, physical disorders, and the ways in which these are related to behavior of school children. Prerequisite: 526. CE

535-4 Introduction to Individual Measurement. Survey of theories and practices in the individual assessment of human behavioral characteristics, to develop understanding and appreciation of these concepts for use in the counseling relationship. Prerequisite: 522. E

536-8 (4,4) Individual Measurement and Appraisal. (a) Children: Designed to teach the administration of the Stanford-Binet and the Wechsler Intelligence Scale for Children. Class periods are devoted to discussions concerning theories of intelligence and problems in the administration of intelligence tests. (b) Adolescents: Designed to teach the administration of the Wechsler Intelligence Scale for Adults. Class periods are devoted to discussions concerning theories of intelligence and problems in the administration and intelligence tests. Prerequisite: 422c. C

536-8 (4,4) Appraisal of Intelligence. (a) Elementary school level, (b) adolescents. Prerequisite: 535. E

537-12 (4,4,4) Counseling Theory and Practice. (a) Systematic study of the assumptions and fundamental practices of major approaches to counseling. Observation and practice utilized to supplement didactic discussion. Prerequisite: consent of chairman. (b) Systematic study of major theories of counseling, as they apply to school situations. Supervised experience in role-playing utilizing these approaches to counseling. Prerequisite: 537a. (c) Continuation of 537b with supervised experience in counseling to illustrate relationship of theory and practice. Prerequisite: 537b. C

537-4 Counseling Theory and Practice I. Systematic study of the major approaches to counseling. Observation and practice utilized to supplement didactic discussion. Prerequisite: 412 and 542. E

538-4 Counseling Theory and Practice II. Systematic study of major theories of counseling, as they apply to school situations. Supervised experience in role-playing utilizing these approaches to counseling. Prerequisite: 537. E

541-4 Occupational Information and Guidance. Designed for school counselors, industrial supervisors, and teachers to give an orientation to and experience with occupational information and vocational adjustment. Prerequisite: 442. CE

542-4 Basic Principles of Guidance. Introductory course on student personnel services. Survey of philosophy, principles, and organization of guidance services. Prerequisite: 305. E

543-4 Guidance Through Groups. Study of the methods, techniques and materials for the organization and utilization of groups for guidance purposes. Prerequisite: 442. CE

545-2 to 4 Seminar in Guidance. (a) Problems in guidance. A seminar-laboratory course to discuss current problems in guidance as met by guidance workers in the field. Prerequisite: advanced standing. (b) Learning and Communications. Students examine theory and research related to communication by reviewing literature, designing studies, and conducting research projects. Prerequisite: consent of chairman. (c) Educational Diagnosis. Use of diagnostic tests in school settings. Includes theory, development, administration, and interpretation of selected diagnostic tools. Prerequisite: 422c. (d) Test Development. Applies measurement principles to the development of tests. Primary emphasis upon achievement test construction and research involving test data. Prerequisite: 422c. (e) Test Analysis. Extends and applies the research implications from 545d. Prerequisite: 545d. (f) Pupil Adjustment. Deals with various concepts of adjustment and their behavioral implications, and the process of adjustment at different life stages. The numerous questions, problems, and controversies that exist in the area of adjustment will be emphasized. Prerequisite: 525. (g) Learning and Instruction. Surveys research in classroom learning and implications for the classroom teacher. Included are practice and review, transfer of training, retention and forgetting, and motivation. Prerequisite: 511. (h) Individual Differences. Extends and applies research implications from 545g. Students will participate in application of findings to classroom situations. Prerequisite: 545g. (j) Or-

ganization and Administration. Presentation of principles, procedures, and plans necessary for initiating, developing, and appraising a school guidance program. Prerequisite: 537a. (k) Rehabilitation. CE

562-8 (4,4) **Human Development in Education.** Theories and research evidence regarding child development and behavior are investigated. These considerations focus upon implications for research and socialization practices. (a) Childhood. Prerequisite: advanced standing. (b) Adolescence. Must be taken in a,b sequence. CE

565-4 **Psychology of Elementary School Subjects.** C

566-4 **Psychology of Secondary School Subjects.** C

573-2 **Selection, Placement, and Follow-up.** Survey of current techniques and criteria used in selection, placement, and follow-up of both handicapped and non-handicapped employees. Prerequisite: advanced standing. C

575a-1 to 12 **Practicum in Counseling.** Practical experience in counseling with a representative sample of the population. May include role playing, psychodrama, and listening to recordings of counseling sessions individually or in groups. Prerequisite: 537a. CE

575b-1 to 12 **Practicum in Elementary Guidance.** Supervised experience in interviewing and counseling, case study, and educational diagnosis with the elementary school child. Prerequisite: 537a. CE

575c-1 to 12 **Practicum in Secondary Guidance.** Supervised experience in guidance functions. Includes counseling with secondary school pupils, conducting parent interviews, consulting with teachers, and the collection and dissemination of information. Prerequisite: 537a. C

575d-1 to 12 **Practicum in Rehabilitation Practices.** Assignment to an agency or institute in the region for supervised training and organizational and procedural aspects of providing rehabilitation and welfare services to recipients. C

575e-1 to 12 **Practicum in College Student Personnel Work.** Laboratory and research course for advanced majors. Students to assist with testing programs, keeping records, and counseling students. Research projects to accompany practical experience. Minimum of 12 hours per week on the job. Prerequisite: 537a. C

576-4 **Practicum in School Personnel Work.** Laboratory research course for advanced majors. Students to assist with testing programs, keeping records, counseling students. Research projects to accompany practical experience. Minimum of 12 hours per week "on the job." Prerequisite: advanced standing and consent of instructor. E

581a-1 to 12 **Internship in Counseling.** C

581b-1 to 12 **Internship in Elementary Guidance.** C

581c-1 to 12 **Internship in Secondary Guidance.** C

581d-1 to 12 **Internship in Rehabilitation Guidance.** C

590-4 **Seminar in Behavioral Foundations.** A two-quarter experience required of all students beginning advanced graduate study. Students examine empirical modes of inquiry and empirical formulations of learning behavior. Topics explored include the classroom as a social system, the learner, learning (transfer), models and data language. Prerequisite: advanced standing. C

596-5 to 9 **Independent Investigation.** C

599-2 to 9 **Thesis.** C

600-1 to 48 **Dissertation.** C

HEALTH EDUCATION

400-4 **Health Appraisal of School Children.** The role of the teacher in the health appraisal of the school child, including school health examinations, use of health records, and emphasis on training for recognition of health deviations from normal common among school children. Not open to students who have had 450. CE

405-3 **Methods and Materials in Social Hygiene.** Designed to prepare the prospective teacher to instruct in various phases of family life education. C

413S-4 **Safe and Healthful Living Outdoors.** This course has to do with safe and healthful living outdoors. Areas to be included are foods, sanitation, survival, plants

and animals, natural hazards, emergency care, water, riflery, and others. Prerequisites: 334S, and at least 10 hours of biological sciences. C

415S-3 to 4 Workshop in Driver Education and Traffic Safety. Summer course designed for pre-service and in-service teachers of driver education and traffic safety. Individual and group problems will be treated. Lectures by safety authorities, demonstrations, field trips, audio-visual materials, and individually supervised research in special problem areas. Prerequisite: 302 or equivalent. CE

443S-4 Methods and Materials in Driver Education. An advanced course in driver education which includes a study of existing courses of study, review of research, course-of-study planning, visitation and reporting, panel discussions, accident statistics, conducting the secondary school program, testing and demonstration in the car. Prerequisite: 302. C

450-4 Health Education in the Elementary School. Responsibilities of schools to instruct their students in basic fundamentals of how to live healthfully. Principles, methods, programs, and materials for the elementary teacher. The integration of health with other subjects, health observation of children, abnormalities, screening tests, and related materials. Not open to students who have had 400. C

460-4 Methods and Materials in Secondary School Health Education. Shows the prospective teacher the fundamental processes involved in the teaching of health education at the secondary level. CE

461-4 Workshop in Health Education. Summer course for in-service teachers, administrators, advanced students, nurses, social workers, and others interested in public health aspects of school and community living. Individual problems of classroom health treated as units in such fields as speech defects and their detection and correction, communicable disease control, nutrition, social and mental hygiene. Lectures, demonstrations, films, field trips, and individually supervised research in special problems. Prerequisite: GSE 201 or equivalent. CE

462-4 Health Education Workshop. A continuation of 461 with emphasis on total school health teaching objectives. C

463-4 Health Education Workshop. A continuation of 462 with emphasis on evaluation of total school health teaching program. C

464-4 Workshop in Alcohol Education. Summer course for in-service teachers, administrators, and others interested in the development and improvement of alcohol education programs at the elementary and secondary school levels. Includes approaches to understanding physiology of alcohol, cultural differences and patterns relative to development of habits and attitudes toward drinking, nature and extent of alcohol problems, teenage drinking and current theories and approaches to alcoholism. Emphasis on the analysis and development of content, methods, materials, teacher preparation, and special needs and problems of individual communities. Demonstrations, lectures, films, field trips, and individual research in special areas. C

471-4 Organization and Administration of School Health. Appraisal of over-all school organization for health education, including health service and personnel, health and safety instruction, school environment, school health examination, local, state, and federal resources for health, health councils, and interdepartmental relationships. CE

475S-4 Traffic Law Enforcement and Planning. To acquaint safety and driver education teachers with the purposes of traffic law enforcement and engineering, and the methods used to fulfill these purposes. Emphasis on ways of improving existing services and co-ordinating the efforts of many official and nonofficial agencies concerned with the traffic problem. Prerequisite: 443S or consent of instructor. C

480S-4 Workshop in Safety Education. Summer course for in-service teachers, nurses, administrators, advanced students, and others interested in safety education as it applies to the public school and the community. Individual problems, lectures, demonstrations, films, field trips and individual group study in special areas of interest. Prerequisite: 313S or 323S or consent of instructor. CE

481S-4 Safety Education Workshop. A continuation of 480S with emphasis on methods and evaluation of total school safety education program. Prerequisite: 313S, or 323S, or 480S, or consent of instructor. C

488-3 Health Education Aspects of Environmental Sanitation. Application of principles of learning to man's contacts with his environment: water, food, air, radiation, housing, and refuse. Emphasis upon both individual and community aspects of environmental health. Prerequisites: GSE 201, 205, or equivalent. C

489-4 Introduction to Vital Statistics. An introduction to biostatistics; examination of theories of population growth; understandings of collection, organization, summarization, presentation, evaluation, and interpretation of data relative to biologic happenings. Prerequisite: Mathematics 220 or equivalent. C

490-2 to 8 Field Work in School and Community Health. Field training, observation, and participation in current public and school health programs. Area schools and public health agencies will be utilized to provide practical experience for the health education student. Restricted to majors. C

500-4 Community Organization for Health Education. Review of the philosophies of community organization for health; techniques of group work, current research in community organization, and examination of programs of community health agencies. C

510-4 Construction of the Curriculum in Health Education. Review of health instruction programs in elementary and secondary schools, consideration of health needs and interests and their relationship to the curriculum, evaluation of health texts, and evaluation of current research. C

511-5 Practicum in Health Education Workshop. Designed to give graduate and post-graduate students experiences in organizing, planning, and operating in-service training programs through workshop methods. C

515-4 Review of Current Literature in Health Education, Public Health, and Safety Education. A survey and analysis of the newer publications in the related fields of health education, public health, and safety education. C

520-4 to 6 Special Projects. For students who may wish to conduct more detailed research and study on advanced problems in the fields of public health, safety education, and health education. C

525S-4 Organization, Administration, and Supervision of Safety Education. Designed to give the student basic principles of organization, administration, and supervision in safety education. Problems, policies, practices, and methods involved in the organization, and administration of a safety education program. C

526-4 Evaluation in Health Education. Survey and analyses of health testing and evaluations, procedure including surveys, inventories, knowledge, behavior and attitude tests, check lists, and questionnaires, their uses and limitations. Evaluation of total school health program is emphasized. Prerequisite: consent of chairman. C

530S-4 Problems and Research in Accident Prevention. Principles of accident prevention, causes of accidents, problems of behavior, and study of current research related to safe behavior in the school, home, traffic, and transportation. Prerequisites: 443S, 525S, or consent of instructor. C

533-12 (4,4,4) Human Conservation. (a) An analysis of community health problem trends and changes including aging; chronic and degenerative diseases; mental illnesses; traumatic illnesses, injuries and defects; radiological hazards; communicable diseases; and maternal and child health problems. An epidemiological approach to the cause, nature, extent, and trends in erosion and wastage of human resources. (b) An analysis of community structures in relation to positive health services, education, and healthful living in respect to community health problems and health requirements. A study of trends in programming to meet minimum health requirements and to care for or ameliorate existing health problems and hazards on a community-wide basis. (c) An analysis of the unmet health needs or requirements for optimum conservation of human resources in the community including a study of pilot and experimental programs and research in community efforts to meet health needs and solve existing health problems. An evaluative approach to existing health programming and research including an analysis of further needed experimentation and research and possible sources for leadership and funds for promoting community health research, programmings, and planning. Must be taken in a,b,c sequence. Prerequisite: consent of instructor. C

536-4 Professional Preparation in Health Education. National, state, local factors influencing teacher preparation in health education, including accreditation of teacher education programs, certification of health education teachers. Undergraduate and graduate curricula developed and analyzed. C

590-4 to 12 Field Internship. Full quarter of field work with an approved department of public health or voluntary health agency under the supervision of the agency officer in charge and the supervisor from the Department of Health Education. C

595-4 to 6 Thesis. C

597-1, 598-1, 599-1 Seminar in Health Education. Seminar for advanced graduate students devoted to discussing individual health projects, presenting research problems and preliminary presentation of dissertation topics. C

600-1 to 48 Dissertation. The dissertation for the Ph.D. degree in the College of Education must meet the minimum requirements of 36 hours. C

HIGHER EDUCATION

401-2 Careers in Higher Education (College Teaching). C

402-2 Careers in Higher Education (College Student Personnel). An exploratory course designed to acquaint the student with the career possibilities and functions of higher education. C

410-4 Higher Education in the United States. An overview of higher education with emphasis on current problems and organizational relationships. C

441-4 Functions and Organization of College Student Personnel. A description and discussion of the functions of college student personnel programs with an emphasis on the organizational relationships of the various functions. C

450-1 Orientation to College Teaching. C

477-2 Principles of College Staff Management. A study of systems and problems of personnel practices. C

511-4 History and Philosophy of Higher Education. A study, using the historical approach, of the development of American philosophy of higher education. C

512-4 Higher Education in the Nations of the World. A comparative study of higher education systems. C

513-4 Policy Making and Control of Higher Education. A case approach to a study of the sources of policy making, the methods of control, and the relationships among various policy making and operating units. C

521 (2 per quarter) Seminar in Higher Education. A series of seminars arranged to meet the needs of specific groups. (a) College Teaching. (b) Student Values. (c) Housing. (e) Staff Personnel. (f) Finance. (g) The Junior College. (m) Sociology of Higher Education. (s) Continuing Education. (v) Academic Administration. (y) The Technical Institute. C

522-1 to 12 Readings in Higher Education. (a) College Teaching. (b) College Student Personnel. (c) College Administration. C

523-1 to 12 Internship in Higher Education. Supervised work experiences in appropriate settings. (a) College Teaching. (b) College Student Personnel. (c) College Administration. C

524-2 to 6 Special Research Problems. (a) College Teaching. (b) College Student Personnel. (c) College Administration. C

546-4 Personnel Work with College Student Groups. A case approach to the understanding of the various aspects and relationships of student cocurricular activities. Emphasis on the role of group activities in the educational life of the student and the college community. C

551-4 Curriculum Design and Development in Higher Education. Examination of methods and resources in designing various college curricula. Emphasis on experimentation in curriculum development. C

565-4 The Junior College. A study of the function of the junior college in American higher education with particular emphasis on relationships to the secondary school and to the community. Course content treats special problems of curriculum, student services, finance, and faculty selection and growth. CE

- 576-4 **Administrative Practices in Higher Education.** A study of administrative behavior with applications to higher education setting. C
- 578-4 **Finance of Higher Education.** A description of the economic aspects of higher education. Study of sources and management of college finance including budgeting and control. C
- 599-1 to 9 **Thesis.** C
- 600-1 to 48 **Dissertation.** Minimum of 36 hours to be earned for the Ph.D. degree. C

HISTORY

- 401-6 (3,3) (C); 401-8 (4,4) (E) **History of the South.** (a) The Old South. (b) The New South. An intensive study of the social, economic, political and cultural developments of the South. CE
- 405-3 **Civil War and Reconstruction.** Emphasis upon the clash of national and sectional interests; economic, political, and military aspects of the conflict; course and consequence of reconstruction. Prerequisite: GSB 300b, or consent of instructor. CE
- 410-2 to 5 **Special Readings in History.** Supervised readings for students with sufficient background. Registration by special permission only. Offered on demand. CE
- 411-9 (3,3,3) **Social and Intellectual History of the United States.** (a) 1607-1830. (b) 1830-1900. (c) 1900 to present. The development of American society and a study of various types of economic, social, and political thought that have influenced it. C
- 411-9 (3,3,3) **Intellectual History of the United States.** (a) 1607-1789. (b) 1789-1900. (c) 1900 to present. Prerequisite: 201-8. E
- 415-9 (3,3,3) (C); 415-12 (4,4,4) (E) **Early Modern Europe.** (a) Renaissance. (b) The Reformation. (c) Age of Absolutism and Enlightenment. Prerequisite: GSB 101b,c. CE
- 417-9 (3,3,3) (C); 417-16 (4,4,4,4) (E) **Advanced English History.** (a) The Empire-Commonwealth. (b) Constitutional History. (c) English Culture in the Age of the American Revolution. (d) Tudor England. E
- 420-3 **The French Revolution.** A sketch of the passing of feudalism in France, the background and development of the revolutionary movement, and the Napoleonic period. CE
- 425-4 **American Colonial History.** Founding of the American colonies and the development of their institutions to 1763. CE
- 428-4 **The Age of Jackson.** Origins, background, and development of that phase of American democracy associated with the Jacksonian era. The political, social, and economic history of the years 1815-44 will be considered in detail. Prerequisite: GSB 300a. E
- 430-9 (3,3,3) **Late Modern Europe.** (a) Age of Revolution, 1815-1880. (b) 1880-1918. (c) Since 1918. Age of Dictatorships. CE
- 432-12 (4,4,4) **Advanced English History.** E
- 435-9 (3,3,3) **Advanced American History.** (a) 1865-1912. (b) 1913-1932. (c) 1932 to present. The major problems and trends from the Civil War to the present. Parts may be taken separately. Prerequisites: GSB 300a,b. C
- 435-9 (3,3,3) **Advanced American History.** (a) 1865-1900. (b) 1900-1929. (c) 1929 to present. Prerequisite: 201-8. E
- 440-6 (3,3) **History of American Diplomacy.** (a) To 1917. (b) 1917 to the present. A study of the important treaty relations of the United States, and a general consideration of American foreign policies. Prerequisites: GSB 300a,b, or consent of instructor. C
- 440-6 (3,3) **History of American Diplomacy.** (a) To 1898. (b) Since 1898. Prerequisite: 201-8. E
- 442-9 (3,3,3) **History of the West.** (a) Colonial. (b) Trans-Allegheny. (c) Trans-Mississippi. C
- 449-4 **Development of Afro-Asian Nationalism.** A study of the rise of national movements, the winning of independence, and the vast array of reconstructional prob-

- lems. Post-Bandung developments and the relation of Afro-Asian nationalism to the Communist world are extensively discussed. C
- 450-4 Europe Since 1914.** Political and cultural developments in 20th century Europe with emphasis on international relations. Prerequisites: GSB 101b,c. E
- 451-3 Historiography.** Development of history as a written subject, including works and philosophy of the various historians in ancient, medieval, and modern periods. CE
- 452-3 Historical Research and Thesis Writing.** The rules of historical research studied and applied to a definite topic. (For history majors only.) CE
- 454-3 Biography in American History.** Outstanding leaders and their contributions to the history of the United States. Attention to historical writers who specialize in biography. Prerequisite: a course in U.S. history. CE
- 455-3 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. C
- 460-9 (3,3,3) Social and Intellectual History of the Middle Ages.** (a) 500-1000. (b) 1000-1250. (c) 1250-1500. C
- 470-3 Argentina, Brazil, and Chile.** A narrative and comparative study of the independent era of the history of the three leading states of South America. C
- 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 modern Mexican life. C
- 473-3 The Caribbean Area in the 20th Century.** An inquiry into the changing role of the political, economic, strategic, and cultural nature of this Mediterranean of the New World. C
- 481-3 Rome: The Early Empire.** E
- 500-3 to 9 History Seminar.** Research methods applied to the various history fields. CE
- 510-2 to 5 Readings in History.** Registration by special permission only. CE
- 515-3 Current United States History and Problems.** A content and research course dealing with contemporary American affairs. Consists of textbook assignments, outside readings. Prerequisite: proper background and consent of instructor. C
- 516-5 Studies in Contemporary Europe.** A content and research course in European civilization since 1914 which stresses the rise of totalitarianism and the democratic crisis. C
- 517-3 Constitutional History of the United States and Problems.** A content and research course involving origin and development of the American Constitution, from English background, through the convention, to the present. C
- 518-3 England in the Age of the "Glorious Revolution."** An analysis of the ideas and forces that converted the English government into a liberal state with an emphasis on the concepts and principles later applied in the establishment of the American Constitution. C
- 519-4 The Age of Jefferson.** 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. CE
- 553-3 New Viewpoints in American History.** New interpretations and recent developments in American history. Prerequisite: GSB 300-6. CE
- 598-3 (1,1,1) Teaching History in College.** Required of all first-year teaching assistants. C
- 599-1 to 9 Thesis.** Minimum of 5 hours to be counted toward a master's degree. C

HOME AND FAMILY

- 407-2 to 8 Workshop.** Aids workers in professions related to home and family. C
- 423-4 Advanced Family Housing.** (Same as Clothing and Textiles 423.) Further appreciation and understanding of aesthetic, economic, psychic, and social factors influencing choice of family housing today. Prerequisite: Clothing and Textiles 323 or consent of instructor. C

424-4 Selection, Use, and Care of Appliances. Materials used in equipment, methods of construction, principles of operation of appliances for cooking, refrigeration, laundering, cleaning; selection, operation, and care of appliances to obtain maximum satisfaction in use. Offered on demand. Prerequisite: 324 or consent of instructor. C

435-4 Work Simplification in Home Management. Basic scientific work simplification principles applied to work done in the home by full-time, employed or physically handicapped homemakers. C

456-4 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. C

466-2 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. Prerequisites: 227, 237 or equivalent. C

471-2 to 6 Field Experience. C

481-2 to 6 Readings. Supervised readings for qualified students. Prerequisite: consent of instructor and chairman. C

500-4 Research Methods. The nature of the scientific method, and basic techniques in home and family research as applied to the collection, analysis and interpretation of data. Prerequisite: Guidance 422b or Mathematics 420, or consent of instructor. C.

540-4 Trends in Consumer Problems. Social, legal, and economic problems that pertain to the consumer. Selection of individual problems for investigation. Prerequisite: 341 or equivalent. C

550-4 Advanced Home Management. Readings, observations, projects, and discussions on selected problems with emphasis on time, money, energy, and family relations. Prerequisites: 331, 332, or equivalent. C

556-4 The Pre-School Child. Growth of the child from birth to six years with emphasis on the various aspects of growth and their interrelationships. C

562-4 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. C

566-4 Interpersonal Relationships Within the Family. Factors that promote satisfactions within the immediate family. Prerequisites: 227 or GSB 341, 237, 331. C

571-4 Recent Research. Review of selected research in various phases of home economics in related fields. Sources of research include colleges, universities, and governmental and industrial agencies. Offered on demand. C

572-2 to 8 Special Problems. For students recommended by their chairman and approved by the head of the department and the instructor in charge for independent work or directed study. C

599-5 to 9 Thesis. Minimum of 5 hours to be counted toward a master's degree. C

600-3 to 48 Dissertation. Minimum of 36 hours to be earned for the Ph.D. degree. C

HOME ECONOMICS EDUCATION

414-4 Home Economics for Elementary Teachers. Units of work in nutrition, school lunches, family and social relationships, textiles, and clothing. C

415-1 Introduction to Graduate Study. Seminar to orient the student to graduate work through relation of courses to goals of program, standards of work, habits of thinking, communication of ideas, uses of professional materials and publications. Required. Students should take at first opportunity. C

481-2 to 6 Readings. Supervised readings for qualified students. Prerequisite: consent of instructor and chairman of department. C

500-4 Research Methods. Methods employed in research in home economics education with special study of one according to interest and needs of student. De-

- velopment of prospectus. Prerequisites: Guidance 422b, or consent of instructor. C
- 505-4 Home Economics in Secondary Schools.** Consideration of the curriculum for homemaking education in the secondary school. A critical survey of resources. The place of homemaking education in the school and community. C
- 506-4 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. Emphasis placed on values. C
- 507-2 to 8 Workshop.** Designed to aid home economics teachers, supervisors, 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. C
- 510-4 Supervision of Home Economics.** Nature, function, and techniques of supervision at all levels. Emphasis given to supervision of student teachers. Experience in the field will be provided for qualified teachers. C
- 510A-1 to 4 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 and Supervision 456 or consent of instructor. C
- 515-4 Trends in Home Economics Education.** Current trends, problems, needs in the field. Attention given to problems and needs of students. C
- 516-4 Advanced Methods of Teaching Home Economics.** Recent trends in methods based on research and experimental programs; furthering good relations in homemaking classes as means of clarifying and accomplishing goals; teacher's role; techniques useful in furthering good relations within group and in meeting individual needs. Emphasis given to social significance of these procedures. C
- 517-4 Methods and Materials for Adult Programs in Home Economics.** Philosophy of adult education; unit planning, methods, techniques, and resources useful in adult homemaking programs. C
- 571-4 Recent Research.** Review of selected research in various phases of home economics in related fields. Sources of research include colleges universities, and governmental and industrial agencies. Offered on demand. C
- 572-2 to 8 Special Problems.** For students recommended by their chairman and approved by the head of the department and the instructor in charge for independent work or directed study. C
- 573-1 to 6 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. C
- 599-5 to 9 Thesis.** Minimum of 5 hours to be counted toward a master's degree. C
- 600-3 to 48 Dissertation.** Minimum of 36 hours to be earned for the Ph.D. degree. C

INDUSTRIAL EDUCATION

- 408-3 Teaching Aids in Technological Education.** Selection of development, analysis, cataloging, and use of commercial and self-made instructional aids and devices. Prerequisite: consent of instructor. C
- 419-8 to 16 Student Teaching in Technical Programs.** Experience in working with special and post-high school technical training programs in approved centers. The student teacher will follow the program of the supervisors of the major specialization in both regular and extra-class activities. C
- 430-2 to 8 Special Problems in Industry and Technology.** C
- 435-6 to 12 Manual Arts Internship.** Supervised hospital experience featuring various applications of manual arts therapeutical treatments. Prerequisite: consent of co-ordinator. C
- 450-1 to 12 (1 to 4 per quarter) Advanced Skills in Technical Subjects.** Modern industrial practices and techniques in various selected technical fields. For experienced persons seeking an opportunity to develop advanced techniques and to increase understanding in specialized industrial fields. Emphasis on modern industrial

processes, methods, materials, and techniques used in school shops, drafting rooms, and industrial organizations. Prerequisite: basic training in area selected for study. Limited to certified teachers. C

465-8 (4,4) Industrial Safety. (See Industrial Technology 465.) C

480-3 Problems of Junior High School Industrial Arts. Ways and means of correlating industrial arts with other curriculum areas, selecting content, and solving problems pertinent to industrial arts at the junior high school level. Prerequisite: 12 hours in technical subjects. C

485-3 Principles and Philosophy of Industrial, Vocational, and Technical Education. An understanding of the nature and purpose of practical arts, vocational and technical education, their relationships and differences, and the place of each in preparing people for the world of work. No prerequisite. C

487-3 Layout and Planning of Technical Facilities. Principles and practices underlying the planning and designing of shops and laboratories in vocational, industrial, and technical education. Prerequisite: 12 hours in technical subjects. C

491-6 (3,3) Principles of Industrial Teaching. (a) Problems and special methods in teaching industrial arts. (b) Emphasis on methods of teaching trade subjects. May be taken in either sequence. Prerequisite: one-half of major must be completed. C

494-3 Organization and Administration of Industrial Education. Principles and policies governing the administration of industrial education programs in elementary, junior, senior high schools; relation of federal and state supervision of industrial education to local administration. Prerequisite: 12 hours in technical subjects. C

495-3 Occupational Analysis. Involves the fundamental steps for analyzing trades and other occupations with some thought toward establishing appropriate units of instruction for the apprentice or student. Jobs, operations, and essential related information are analyzed. Prerequisite: 12 hours in technical subjects. C

496-3 Selection and Organization of Subject Matter. Selection and arrangement of teaching content; preparation of assignment, operation, information, and job sheets; preparation of tests. Prerequisite: 12 hours in industrial education. C

497-3 Teaching of Reading in Technological Education. An understanding of the literature available, one's obligation for keeping abreast of new developments and emphasis on reading and scanning for new ideas in student's specialized field. Prerequisite: 12 hours in industrial education. C

498-3 Planning Multiple Activity Programs. Philosophy, techniques and administration of laboratories and shops featuring multiple offerings. Prerequisite: consent of instructor. C

502-6 Measurements and Evaluations of Products and Procedures. Criteria and instrument development, testing techniques, and appraisals. Special emphasis given to the principles and methods of evaluation of progress in laboratory and shop subjects of a practical arts nature. Experience in development and construction of pertinent and effective evaluative devices. C

504-4 History of Industrial and Vocational Education. A study of the leaders, organizations and movements in the evolution of modern technological education. C

505-4 Administration and Supervision of Industrial Education. Principles, practices, and techniques relating to supervising and administering local programs. C

506-4 Co-operative Programs. Programs and procedures involved in setting up and operating co-operative work-study programs. C

540-2 to 6 Research in Technological Education. Basic research methods and techniques in the design, investigation, and reporting of research studies relating to technology and technological education. C

541-4 Occupational Information and Guidance. Designed for school counselors, industrial supervisors, and teachers to give them orientation to and experience with occupational information and vocational adjustment. Prerequisite: consent of instructor. C

550-4 College Teaching of Industrial and Technical Subjects. Problems of college students and their adjustments to college-level industrial and technical subject-matter. Organization of instructional materials; methods of instruction; organization

and administration of college laboratory facilities; and the professional problems, ethics, and advancement of college technical teachers. Prerequisite: 540 or Educational Administration and Supervision 500. C

560-2 to 12 (2 to 8 per quarter) New Developments in Technological Education. An intensive course designed to acquaint graduate students and teachers with the most recent and significant developments, pressing problems, and emerging trends in the industrial education and technical fields. Selected subjects will be considered by recognized authorities in the field, who will present their ideas and conduct discussions on the selected topics. C

570-2 to 6 Special Investigations in Industrial Education. C

580-3 to 9 Seminar in Technological Education. C

599-1 to 9 Thesis. C

INDUSTRIAL TECHNOLOGY

400-9 (3,3,3) Plastics Technology. (a) Uses of plastic materials including laboratory research and techniques using various methods of fabrication and processing of plastic materials. (b) Properties of high polymers, stability, testing, rheology, mechanical, electrical, thermal, optical and chemical properties, specialty uses. (c) Plastics as materials of construction and their uses in industrial applications, laminates, engineering properties of rubbers, foams, adhesives and surface coatings, designing with plastics; plastics in electrical applications. C

465-8 (4,4) Industrial Safety. (a) Basic fundamental principles of industrial accident prevention; significant accident statistics and costs; appraising safety performances; industrial plant hazards and safeguards; fire control fundamentals. (b) Effective industrial safety organizations, management and supervision; industry safety psychology; safety training programs; industrial hygiene programs; health safeguards; occupational diseases and other industrial hazards. Prerequisite: consent of instructor. C

506-2 to 12 Industrial Design Research. Individual research in industrial design. Prerequisite: 9 hours in industrial design or comparable experience in industry. C

INSTRUCTIONAL MATERIALS

400-2 Library Research Methods. Introduction to the use of library materials in graduate research. Includes a survey of scholarly publishing and the use of reference works in various subjects. CE

403-4 School Library Functions and Management. Effective library services in relation to the educational objectives of elementary and secondary school programs: organization, supervision, finance, housing, equipment, standards, and evaluation. CE

405-4 Library Materials for Children. Study of the aids, methods, and criteria for the selection and use of books and other instructional materials for children in the elementary schools. Open to juniors with consent of instructor. CE

406-4 Library Materials for Adolescents. A study of the aids, methods, and criteria for the selection and use of books and other instructional materials for students in the high school. Open to juniors with consent of instructor. CE

410-4 Public Library Administration. The administration of municipal, county, and regional libraries, both large and small, with emphasis on meeting the needs of different types of communities. C

417-4 Audio-Visual Learning Methods in Education. Selection and utilization of instructional materials in the learning environment, elementary through adult levels. Audio and visual materials and procedures are emphasized with some attention given to bibliographies and reference books for teachers. C

420-4 School Library Activities and Practice. Supervised practice and observation integrated with instruction in the typical activities of school librarianship: storytelling, publicity, developing units of library instruction, and work with students. Prerequisites: 306, 308, 403, 405, or 406. CE

- 440-2 Photography for Teachers.** Techniques of picture-taking and the preparation of color slides of community resources for use in classroom instruction and for school public relations. C
- 445-4 Preparation of Teacher-Made Audio-Visual Materials.** Laboratory practice in the preparation of bulletin boards, opaque materials, models, slides, recordings, felt-boards, and other graphic materials. Prerequisite: 417 or consent of instructor. CE
- 448-4 Supervision and Administration of an Audio-Visual Program.** C
- 450-2 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. C
- 457-4 Radio and Television in the Classroom.** Educational programs and their value to the teacher in the classroom. Sample tapes of radio programs and kinescopes are used. C
- 458-4 The Medium of the Motion Picture.** A study of the full range of expression by motion pictures including the documentary, theatrical, educational, experimental, and industrial films. Representative films are screened. C
- 470-4 Programmed Instruction.** The principles and practice of writing both linear and intrinsic types of programmed instruction with emphasis on pictorial and performance branches. Individual experience in planning and producing programs. C
- 510-4 Mass Communications in Education.** The use of mass media in the classroom. Includes radio, TV, comic books, newspapers, magazines, motion pictures. C
- 514-4 Survey of Research and Development in Instructional Materials.** Advanced readings in research in instructional materials and the practical application of findings. Prerequisites: 405, 406, 417 or consent of instructor. C
- 530-4 History of Books and Libraries.** The evolution of the printed book and the rise and development of modern libraries. C
- 546-4 Integration of Audio-Visual Materials in the Classroom.** Selection of materials on the basis of curricular needs. Techniques of evaluating each type of audio-visual material for use in the classroom. Prerequisite: 417, consent of instructor. CE
- 547-4 School Film and Filmstrip Production.** Simplified techniques for teachers and audio-visual co-ordinators who may need to produce school-made films and filmstrips to meet local school problems. C
- 548-4 Supervision and Administration of an Audio-Visual Program.** Provides professional information and training for anyone who has administrative responsibilities for an audio-visual program. For teachers, co-ordinators, or directors. Prerequisite: 417, consent of instructor. CE
- 549-4 Visual Learning.** Learning from pictures in the classroom, the design of still and moving pictures, pictures used in testing perception, and the place of pictures in advertising and communication. Prerequisite: consent of instructor. C
- 554-4 Administration of an Instructional Materials Center.** Based on the concept of a single agency in the school that encompasses all forms of instructional materials. It is designed to further the training of specialists in the supervision and administration of integrated audio-visual and library programs. Prerequisites: 403, 548, Educational Administration and Supervision 456, 460, or equivalent. C
- 560-4 Seminar in Instructional Materials.** Designed to give advanced graduate students an opportunity to investigate and discuss topics in instructional materials before the seminar group. Topics selected would depend on background and interest of individuals. Prerequisite: consent of instructor. C
- 576-2 to 8 Problems in Instructional Materials.** Opportunity for individual study of selected problems. Prerequisite: consent of instructor. C
- 599-5 to 9 Thesis.** Minimum of 5 hours to be counted toward a master's degree. C

JOURNALISM

- 420-2 to 4 High School Journalism Clinic.** For public school teachers. C
- 421-4 School Publications.** Designed for the prospective journalism teacher or high

school publications director. Deals with practical production problems of newspapers and yearbooks. C

422-3 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. C

432-3 Communication Agencies and Public Opinion. Press, radio, television, and motion pictures and their role in the opinion process. C

433-3 Measurement of Public Opinion. The sampling survey as a research tool; survey methodologies. C

440-3 Content Analysis. Theory and practice of various systems designed to reveal the orientation of editorial material in the mass media. C

442-3 The Law of Journalism. C

449-2 Practicum. Study, observation, and participation in publication supervision. Work required on *The Egyptian* newspaper. C

479-3 Role of Advertising in our Society. An exhaustive analysis of the literature covering such topics as: definitions and scope of advertising; advertising and the press; advertising as a social and economic force; evaluation of advertising; policies as related to the practices of specific business firms. C

494-2 Magazine Article Writing Workshop. C

495-3 Book Reviewing. Theory and practice in reviewing modern books; study of newspapers and magazines devoted entirely or in part to this type of journalism. C

499-3 Summer Workshop in News Analysis in the Classroom. A study of the relationship of the newspaper to other high school coursework. Time spent in developing ways of integrating the newspaper in the classroom. C

501-1 to 9 Literature of Journalism. Critical reading of selected books relating directly and indirectly to journalism; lectures; reviews; discussions. C

530-2 Seminar in Press Freedom. Observation of the comment function performed by the daily newspaper as related to current issues; role of the editorial writer, syndicated columnist, cartoonist. C

532-4 Seminar in Public Opinion and Propaganda. Study of the developing literature in this field of specialization. C

533-1 to 9 Research Problems in Journalism. Individual work on selected problems for research. C

540-3 Philosophy of Journalism. A study of journalistic ethics with emphasis on concepts of freedom and responsibility and the development of journalistic standards. Consideration given to study of the responsibility of press in modern society. C

599-3 to 9 Thesis. Minimum of 5 hours to be counted toward a master's degree. C

600-1 to 48 Dissertation. Minimum of 36 hours to be earned for the Ph.D. degree. C

MANAGEMENT

421-4 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. Scope includes both short-term working capital and long-term financing. Prerequisite: 320.. CE

428-4 Life Insurance. Particular attention given to policy forms and provisions, reserve and investment problems, company organization, legal aspects, taxation, and personal and business needs. Prerequisite: 327. C

442-4 Management of Data Processing Systems. A systematic examination of the principles and practices of data processing management. Includes installation layout, employment requirements, machine utilization, scheduling, work loads, interdepartmental relations, legal considerations, etc. Prerequisite: 241. E

455-4 Programming for Digital Computers. Computer organization and characteristics, machine language-coding, flow charts, sub-routines, optimum and symbolic coding, compilers and interpretative systems. Laboratory uses Computing Center equipment. Prerequisite: consent of instructor. C

472-5 (C); 472-4 (E) Small Business. Small business analysis, primarily through case

studies of business financing, location, organization, merchandising practices, records, government regulation, and taxes. Open only to business majors. CE

473-4 Business Enterprise and Public Policy. A social and legal evaluation of the federal laws designed to stimulate competition, emphasizing the anti-trust and fair trade laws. Prerequisite: senior standing. CE

475-4 Budgeting and Systems. Budgeting and system as aids in coordinating and directing business operation. Prerequisites: 320. Accounting 251c. CE

479-2 to 8 Problems in Business and Economics. Application of economic theory to practical business problems. CE

480-4 Recent Labor Law Developments and Problems. A legal and social evaluation of the most recent labor law problems and court decisions, including the Taft-Hartley Act and the 1959 amendments, Fair Employment Practice Laws and the Fair Labor Standards Act. Prerequisite: business law or Economics 310 or Government 395 or consent of instructor. CE

481-4 Administrative Management. An intensive study of the principles of management and their application to the current industrial setting. Lecture and case methods will be used. Prerequisite: 340. CE

483-4 Advanced Production 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: 380. CE

485-4 Problems in Personnel Management. Analysis of problems in personnel administration arising from current developments in organization and techniques; case problems and special reports. Prerequisite: 385. CE

500-2 to 5 Readings. Directed readings in classical and current writings on selected topics. C

501-2 to 5 Individual Research. Directed research in selected areas of business administration. C

521-4 Financial Policies. An evaluation of selected financial policies of corporate enterprise with emphasis on capital budgeting, on the equity and current position. Prerequisite: 320 and consent of instructor. C

527-3 to 5 Seminar in Finance. Current issues and practices in business finance. Each student will select a problem for intensive exploration and report his findings to the class. Prerequisite: 421 or consent of instructor. C

540-5 History and Theory of Management. An analytical study of the background and growth of management theory from its beginnings with Taylor and Fayol to the present. Emphasis will be largely on industrial application. Individual reports as well as case and lecture methods will be used. Prerequisite: 481. C

573-4 Business and Government. The regular regulation of industry and labor, emphasizing complications for firm policies of the most current developments and court decisions. Topics include current industrial and labor monopoly, administrative regulation, consumer interest, credit management, and the proper role of the judge, management, union and association. Prerequisite: graduate standing or consent of instructor. C

576-4 Business Conditions Analysis. Adaptation of business conditions indicated by measurements, evaluating, and forecasts of the individual firm. Prerequisite: graduate standing or consent of instructor. C

581-4 Business Policies. Consideration of the policies of the top management of a business relative to alternative choices of action. Prerequisite: graduate standing or consent of instructor, applied decision theory. C

594-4 Seminar in Management. Study of the most recent developments in a particular area of management. Individual reports, book reports, and survey of current professional literature form the bases of the course. Prerequisite: 340 or consent of instructor. C

595-4 Seminar in Personnel Management. Study of recent developments in personnel management. Individual reports, book reports, and survey of current professional literature form the bases of the course. Prerequisite: 485 or consent of instructor. CE

596-4 Seminar in Production Management. Current theories in production manage-

ment. Individual reports, book reports, and survey of professional literature form the bases of the course. Prerequisite: 483 or consent of instructor. C
 599-2 to 9. Thesis. Minimum of 5 hours to be counted toward a master's degree. C

MARKETING

438-4 Sales Management. Developing and training a sales force. The different types of sales forces. Managing sales functions: determining salesmen's territories, quotas, compensation. Budget preparation. Development and implementing the merchandise plan. Prerequisite: 325 or to be taken concurrently (C); 230 and 237 or consent of instructor. (E). CE

444-4 Marketing Management. Marketing management's place in theory and as a part of the marketing process. Emphasis given to planning the marketing effort, management of the marketing organization and control of marketing operations. Prerequisite: 230-5, senior standing. E

451-4 Traffic Management. Primary industrial traffic management functions, including determination of rates, classification, routing, and proper documentation. Consideration given to loss and damage claims, terminal charges, demurrage, reconsignment and conversion, transit privileges, warehousing, and packing. Emphasis upon co-operative aspects of traffic management requiring transportation. Prerequisite: 341. CE

463-4 (C); 463-3 (E) Advertising Management. The effective use of advertising by business management. An understanding of what advertising can be expected to accomplish under different sets of marketing factors and products. The selection of advantageous advertising programs under different marketing mixes. Prerequisite: 333 or consent of instructor (C); 333 (E). CE

490-4 Marketing Research and Analysis. A nonmathematical development of the basic procedures, methods, and theory underlying analysis of primary and secondary market data. Prerequisites: 325, and one quarter of basic statistics or its equivalent (C); 230 and a quarter of business statistics (E). CE

500-2 to 5 Readings in Marketing. Readings in classical and current writing on selected topics in various areas in the field of marketing. C

501-2 to 5 Individual Research in Marketing. Directed research in marketing. C

550-4 Graduate Survey of Marketing. Designed to give the graduate student an over-all view of the field of marketing and the field of policy-making decision. Cases are used to illustrate the theory covered. An accelerated course. (Not open to students who have had 10 or more hours of marketing in their undergraduate preparation.) CE

555-4 Marketing Theory. An advanced course which relates theory in related disciplines with evolving marketing concepts. The development of marketing thought, theory of market behavior, and an appraisal of the application of existing theory are emphasized. Prerequisites: 325, 550 or equivalent. C

560-4 Marketing Policies. The marketing management approach in the determination of policies employed in solving problems in marketing. Prerequisites: 325, 550 or equivalent. CE

575-4 Seminar in Transportation. Students will be required to investigate and discuss before the seminar group such topics as inter-carrier competition, rate level adjustment, financing, and public policy considerations. Subjects and procedures to be arranged at the first meeting of the course. Prerequisite: 451 or consent of instructor. C

590-4 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: 490 or consent of instructor. C

595-3 Seminar in Marketing. Problems in marketing theory, research, and policy. May be repeated by a student no more than two times. Prerequisite: 325 or 550. CE
 599-2 to 9 Thesis. CE

MATHEMATICS

400-3 History of Mathematics. An introduction to the development of major mathematical concepts. Particular attention given to the evolution of the abstract concept of space, to the evolution of abstract algebra, to the evolution of the function concept, and to the changes in the concept of rigor in the development of mathematics from 600 B.C. Prerequisite: 150b (E), 320a or consent of instructor (C). CE

407-3 Introduction to Partial Differential Equations. A continuation of 305. Topics in applied mathematics including linear partial differential equations, Bessel functions, and vector analysis. Prerequisite: 305b. CE

410-16 (4,4,4,4) Statistical Analysis. For students in fields using statistical methods but who are not required to take calculus. Includes (a) elements of probability, estimation, and testing hypotheses; (b) the general linear model (multiple linear regression, analysis of variance, analysis of covariance) and non-parametric statistics; (c) design of experiments; (d) sample survey techniques. May not be used to satisfy requirements for a mathematics concentration. Three lectures and two laboratory hours per week. Must be taken in either a,b,c,d or a,b,d,c sequence. Prerequisites: GSD 108c or 114b. CE

413-4 Solid Analytic Geometry. An algebraic study of equations of the first and second degree in three variables, with applications to geometry. Systems of planes; equations of lines in symmetric and parametric form. Spheres, cylinders, surfaces of revolution. Matrix algebra; real orthogonal and symmetric matrices. Coordinate transformations; orthogonal similarity. Quadratic forms and quadric surfaces; invariants; principal axes and planes. Prerequisite: 252b or consent of chairman. CE

415-4 Non-Euclidean Geometry. An introduction to hyperbolic and elliptic plane geometry and trigonometry. Emphasis given to the nature and significance of geometry and the historical background of non-Euclidean geometry. Prerequisite: 252a. E

420-3 Orthogonal Functions. Principal emphasis on Fourier series and applications. Also includes discussion of other orthogonal sets, such as the Legendre's polynomials, and orthogonalization procedures, such as Gram-Schmidt. Prerequisite: 252b. C

421-6 (3,3) Linear Algebra. The theory of determinants and systems of linear equations; vector spaces, linear independence, bases, dimension; linear transformations, change of base, similarity; quadratic and Hermitian forms, orthogonal and unitary transformations; triangular and diagonal form; eigenvalues and eigenvectors; normal matrices; nilpotent and idempotent matrices, the spectral theorem. Must be taken in a,b sequence. Prerequisite: 252b. CE

425-3 Theory of Numbers. Topics in elementary number theory, including properties of integers and prime numbers, divisibility. Diophantine equations, and congruence of numbers. Prerequisite: 320a. CE

426-6 (3,3) Mathematical Logic. (Same as Philosophy 426.) (a) Matrix and set theoretic development of the propositional calculus, many-valued logics, modal logics. Completion and consistency proofs for the propositional calculus. (b) A formal development of the predicate calculus and related problems. Must be taken in a,b sequence. Prerequisite: 320a or consent of instructor. C

430-4 Projective Geometry. Introduction to the fundamental concepts of projective geometry. Topics usually include the study of conics, polar systems of conics, homogeneous coordinates, cross-ratio, harmonic sets, duality, projectivities, and involutions. Prerequisite: 252a or consent of instructor. CE

433-3 Theory of Point Sets. General properties of sets; topology of plane sets; closed sets and open sets in metric spaces, homeomorphisms and continuous mappings, connectedness. Prerequisite: 252b and six credits in courses numbered 300 or higher, or consent of instructor. CE

440-2 to 4¹ Modern Algebra for Teachers. An introduction to algebra as a logical system, including groups, rings, and fields. Prerequisite: consent of instructor. CE

442-2 to 4¹ Survey of Geometry. A survey of geometry, including projective geometry, topology, etc. Prerequisite: consent of instructor. CE

446-4 The Structure of Elementary School Mathematics. E

- 447-4 The Structure of Secondary School Mathematics.** E
- 452-9 (3,3,3) Advanced Calculus.** Fundamental concepts of analysis: limits, continuity, differentiation, and integration. Major topics include partial differentiation, vector analysis, Riemann-Stieltjes integrals, multiple integrals, infinite series, improper integrals, uniform convergence, Fourier series, and line and surface integrals. Must be taken in a,b,c sequence. Prerequisite: 252b. CE
- 456-6 (3,3) Applied Mathematics for the Behavioral Sciences.** Introduces students in the behavioral sciences to general mathematical procedures as an aid to analyzing the structures of their study and to particular techniques that are in current use. Includes: sets and propositional logic, partitioning and combinatorial analysis, probability theory, linear algebra, linear programming and game theory, difference equations. The mathematical content is at an introductory level; applications from the behavioral sciences are used throughout. Must be taken in a,b sequence. Prerequisite: GSD 108c or 114b. CE
- 460-4 Modern Geometry.** Advanced topics in Euclidean geometry by the synthetic method. Topics include the nine-point circle, Simson line, theorems of Ceva and Menelaus, coaxal circles, harmonic section, poles and polars, similitude, and inversion. Prerequisite: 20 hours of college mathematics. CE
- 475-9 (3,3,3) Numerical Analysis.** Introduction to approximation methods including finite differences and interpolation; numerical differentiation and quadrature; least squares approximation; numerical solution of linear and non-linear systems; numerical integration of systems of ordinary and partial differential equations. Emphasis upon error analysis throughout. Must be taken in a,b,c sequence. Prerequisite: 305a or 252b and consent of instructor. CE
- 480-10 (4,3,3) Probability.** Introduction to probability theory. Includes the algebra of probabilities; discrete and continuous distributions, limit theorems, generating functions, and some elements of stochastic processes. Must be taken in a,b,c sequence. Prerequisite: 252b. CE
- 483-4 Statistical Inference.** A mathematical introduction to statistical methods. Topics include sampling distributions, estimation, tests of hypotheses, and regression analysis. Prerequisite: 480a. CE
- 484-4 Design of Experiments.** A study of the mathematical and practical considerations involved in the statistical design and analysis of experiments. Consideration given to common experimental designs and such topics as missing plots, experimental constraints, efficiency of method, and separation of degrees of freedom. Prerequisite: 483. CE
- 501-9 (3,3,3) Real Variables.** A basic course in mathematical analysis. (a, b) The real number system; fundamental theorems in limits and continuity; open, closed, compact, and connected sets in Euclidean and metric spaces; the Riemann and the Riemann-Stieltjes integrals and functions of bounded variation; infinite series; uniform continuity; uniform convergence of series and improper integrals; arcs and curves; implicit function theorem; multiple integrals. (c) The general theory of measure and integration from an abstract point of view. Additive classes of sets, Borel sets, measurability, measure and outer measure; integrable functions, convergence theorems; absolute continuity and the Radon-Nikodym theorem; Fubini's theorem. Must be taken in a,b,c sequence. Prerequisite: 452c. CE
- 510-4 Foundations of Mathematics.** A critical survey of the logical basis of mathematical systems. Deductive processes, mathematical proof theory, axiomatics, nature of model systems, principles of theory construction, views concerning the nature of mathematics. Prerequisites: 252b, or consent of instructor. CE
- 520-8 (4,4) Modern Algebra.** Displays some of the richness of algebra when mathematical systems other than the traditional one based upon the real numbers are considered. Abstract theory of groups, rings, and fields, with particular attention to examples from permutation groups, matrices, vector spaces, and polynomial and other

¹ These courses are open to candidates for the M.S. in Ed. degree in mathematics, to National Science Foundation Institute participants, and to those who have received the consent of the chairman of mathematics or the director of the institute.

function spaces; rational numbers and fields, complex numbers, unique factorization, algebraic number fields. Must be taken in a,b sequence. Prerequisite: 320a and 421a. CE

530-3 to 6 Point Set Topology. Topological spaces; denseness, category; open, closed sets, Borel sets; separation axioms; subspaces; continuity; lattice of topologies; countability axioms; connectedness, compactness, local properties; regularity to complete normality. Hilbert space, metrizable spaces; extension theorems; well-ordering; product spaces. Prerequisite: 433 or 501b. CE

536-3 Differential Geometry. Curvature, torsion, the Frenet formulas, and intrinsic equations of curves in three-dimensional Euclidean space; applications to kinematics. Curves on a surface; first and second fundamental forms; normal sections and Meusnier's theorem; mean and total curvature. Prerequisite: 452c. C

540-4¹ Groups and Linear Transformations. A study of groups with their connection with the movements of regular plane figures, matrices, vectors, determinants with their interpretation and use in analytic geometry, and ruler and compass constructions. Prerequisite: 440 or equivalent. CE

541-2 to 4 Sets and Probability. The elements of probability, with some applications to social sciences for secondary school teachers. Prerequisite: consent of instructor. E

542-2 to 4 Elementary Functions from an Advanced Standpoint. Analysis of properties of algebraic, trigonometric, exponential, and logarithmic functions using contemporary notion of function. Prerequisite: consent of instructor. E

544-2 to 4¹ Fundamental Concepts of Calculus. A careful study of the basic concepts of calculus offered as part of the special graduate program for secondary school teachers. Prerequisite: consent of instructor. CE

545-4¹ Intermediate Analysis for High School Teachers. A rigorous development of differentiation and integration of continuous real functions. Topics include sequences, series, limits, real continuous functions, integrable functions on a closed interval. Prerequisite: consent of instructor. C

546-4¹ Convex Figures. An analysis of methods of the theory of plane convex bodies. Topics covered include Helly's Theorem, continuous functions, isoperimetric problems, curves of constant width. Prerequisite: 440, 543 (or 415), or consent of instructor. C

550-1 to 10 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. Prerequisite: consent of instructor. CE

555-6 (3,3) Complex Variables. A thorough treatment of classical analytic function theory including the Cauchy-Riemann equations, conformal mapping, Riemann mapping theorem, Cauchy-Goursat theorem, calculus of residues, analytic continuation, entire functions, gamma and beta functions, Bessel's and Legendre's equations, elliptic integrals. Must be taken in a,b sequence. Prerequisite: 452c. CE

560-3 Calculus of Variations. For students in mathematics and the sciences as an introduction to the ideas and techniques of the calculus of variations. Topics covered include the Euler equation, the brachistochrone problem, minimal surfaces, isoperimetric problems, Fermat's principle, particle dynamics and Sturm-Liouville systems. Prerequisite: 452c. C

580-9 (3,3,3) Mathematical Methods of Statistics. A presentation of probability and statistical inference based on an axiomatic approach and employing advanced mathematical concepts. Topics include the theory of measure and integration in R_n , foundations of probability, random variables and distributions in R_n , sampling distributions, tests of hypotheses, theory of estimation. Must be taken in a,b,c sequence. Prerequisite: 452c. C

592-3¹ Research in Mathematics Education. Critical study of research papers in

¹ These courses are open to candidates for the M.S. in Ed. degree in mathematics, to National Science Foundation Institute participants, and to those who have received the consent of the chairman of mathematics or the director of the institute.

the field of secondary mathematics education. Training in research and writing techniques as they pertain to the secondary mathematics program. Prerequisite: consent of chairman. C

595-1 to 10 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. CE

599-1 to 9 Thesis. Minimum of 5 hours to be counted toward the M.A. degree. C

MICROBIOLOGY

403-5 Medical Bacteriology. A general survey of the mechanisms of infection, epidemiology, and immunity and the specific application of these principles to the symptomatology, diagnosis, treatment, and control of the more common bacterial infections of man. 3 hours lecture and 4 hours laboratory. Prerequisite: 301 and 302 or equivalent. C

422-5 Microbiology of Foods. The relationships of microorganisms to the preparation and preservation of foods with consideration of the laws governing sanitation, chemical preservatives, and fair dealing of the food producer. 3 hours lecture, 4 hours laboratory. Prerequisite: 301. C

423-5 Industrial Fermentation. The application of the chemical activities of microorganisms to the industrial production of beverages, foods, antibiotics, and various commercial chemicals. 3 hours lecture, 4 hours laboratory. Prerequisites: 301 and organic chemistry. C

425-3 Biochemistry and Physiology of Microorganisms. The chemical basis of physiological functions in microbial cells with emphasis on the pathways of metabolism common to all living things. 3 hours lecture. Prerequisites: 301 and organic chemistry. C

426-2 Biochemistry and Physiology of Microorganisms. 4 hours laboratory. Prerequisite or corequisite: 425. C

441-6 Virology. Properties, cultivation and titration of viruses and rickettsiae; cellular infection, multiplication and liberation of virus; immunological reactions and serological identification; hemagglutination and interference phenomena. Consideration of selected viral and rickettsiae diseases of animals. 3 hours lecture, 6 hours laboratory. Prerequisite: 403. C

451-6 Immunology. Natural and acquired immunity; antigens, antibodies and antigen-antibody reactions; hypersensitivity; practical use of immunity and hypersensitivity. 3 hours lecture, 6 hours laboratory. Prerequisite: 403. C

500-1 Seminar. C

501-2 Genetics of Microorganisms. The general principles of genetic analysis with accent on tetrad analysis of yeast. 2 hours lecture. C

503-2 Cytology of Microorganisms. Problems involved in the behavior of chromosomes at meiosis with special consideration of genetical data. 2 hours lecture. C

504-5 Methods of Microbiological Research. The recognition and plan of attack upon unsolved problems in microbiology. 3 hours lecture and 4 hours laboratory. C

506-2 Bibliographical Methods in Microbiology. Methods of communication of information in microbiology. 1 hour lecture, 2 hours laboratory. C

511-1 to 15 Research. C

525-3 Biochemistry and Physiology of Microorganisms. A continuation of 425. 3 hours lecture. C

526-2 Biochemistry and Physiology of Microorganisms. A continuation of 426. 4 hours laboratory. Prerequisite or corequisite: 525 C

528-1 to 10 Readings in Microbiology. Supervised readings for qualified graduate students. C

550-4 Microbiology for High School Teachers. Principles of microbiology with emphasis on the relation of the microbial world to plants and animals. Information regarding materials and methods applicable to high school biology courses. 2 lectures and 2 laboratory periods or field trips per week. Offered only for N.S.F. students. C

551-2 Intermediate Microbiology for High School Teachers. Continuation of 550

with emphasis on recent developments in microbial genetics, aspects of medical bacteriology, immunology, and virology. Two lectures and occasional demonstrations. C
552-1 Seminar in Biological Sciences. Discussion of topics in biology of particular interest to high school biology teachers. C
599-3 to 9 Thesis. Minimum of 5 hours to be counted toward a master's degree. C
600-3 to 48 Dissertation. Minimum of 36 hours to be earned for the Ph.D. degree. C

MUSIC

- 411-3 Music Literature.** Development of the symphony and the symphonic poem to 1900. CE
412-3 Choral Literature. The literature of the larger vocal forms such as the cantata and oratorio to 1900. C
413-3 Chamber Music Literature. Chamber music literature from the Renaissance to the present. C
441-6 (2,2,2) Counterpoint. (a) 16th Century Counterpoint. Species counterpoint and creative writing in the style of Palestrina and his contemporaries. Prerequisite: 207. (b) 18th Century Counterpoint. Analysis and creative writing in the contrapuntal-harmonic technique of Bach and his contemporaries. Prerequisite: 442. (c) Canon and Fugue. Analysis and creative writing of the larger imitative forms. Prerequisite: 442. C
442-6 (3,3) Contrapuntal Forms. (a) Analysis and creative writing in the style of Palestrina and his contemporaries and the contrapuntal-harmonic technique of Bach. (b) Analysis and creative writing of the larger imitative forms. Must be taken in a,b sequence. Prerequisite: 205c. E
451-2 The Teaching of General Classroom Music (C); 451-2 The Teaching of General Classroom Music in the Junior and Senior High School (E). CE
455-2 to 6 Elementary Music Education Workshop (C); 455-4 Workshop for Elementary Music Education (E). CE
461-2 Teaching Techniques and Materials for the Beginning and Intermediate Levels (C); 461-6 (3,3) Teaching Techniques and Materials (E). For piano or voice students in the B.Mus. or M.Mus. degree programs. Problems of private, studio teaching and college-level teaching are discussed. CE
462-2 Teaching Techniques and Materials for the Advanced Student. Continuation of 461. E
465-3 Development and Teaching of Strings. Place and function of string education in the elementary and secondary schools. Techniques of heterogeneous and homogeneous string teaching. Developing and sustaining interest in the string program. Resource aids. Prerequisite: senior standing. E
481-2 to 6 Readings in Music Theory. C
482-2 to 6 Readings in Music History and Literature. C
483-2 to 6 Readings in Music Education. C
501-3 Introduction to Graduate Study in Music. Basic bibliographical and research techniques in music theory, literature, and education. C
502-9 (3,3,3) History and Analysis of Musical Style. Style in relation to evolution of musical materials. CE
503-3 Objective Research Techniques in Music Education. C
512-3 History of Opera. The development of opera as a form, with a detailed study of operas since 1600. C
515-3 20th Century Literature. A survey of contemporary music in Russia, Western Europe, and the Americas in its relation to sociology, political, and cultural developments. CE
518-3 Pedagogy of Music Literature. Principles of teaching music literature and music appreciation courses at the college level. CE
520-3 American Music. The development of music in America from colonial days to present. CE

- 522-3 Seminar: Music History and Literature.** Advanced study in special periods of music history-literature. Offered on demand. CE
- 530A-3 to 9 Music History. 530B-3 to 9 Music Literature. 530C-3 to 9 Music Theory.** C
- 531-2 to 9 Advanced Composition.** Composition in the larger forms for solo and ensemble performance. Prerequisites: 312c, 342c, and consent of instructor. Required of all theory-composition majors three hours per term; elective credit for majors in other areas. C
- 535-3 Contemporary Idioms.** Techniques of composition developed during the 20th century by composers of Europe and America. CE
- 545-3 to 9 Philosophy of Music Theory.** An orientation of the philosophies of theory to the problems of pedagogy. Required of all theory-composition majors. C
- 550-2 to 4 Organization and Administration of Music—Elementary (C); 550-8 (4,4) Organization and Administration of the Music Education Program (E).** CE
- 551-2 to 4 Organization and Administration of Music—Secondary.** C
- 553-3 Seminar in Choral Materials and Techniques (C); 553-6 (3,3) Seminar in Materials and Techniques (E).** CE
- 554-3 Seminar in Instrumental Materials and Techniques.** C
- 556-2 to 6 Advanced Conducting.** Problems in score reading and interpretation. Laboratory conducting of larger ensembles. CE
- 560-2 to 3 Seminar in Music Education.** Trends, current practices, philosophies of music education. CE
- 566-1 to 4 Instrumental Ensemble.** Participation in a chamber or large ensemble for purposes of studying and performing literature in the field of the major instrument other than solo literature. CE
- 567-1 to 4 Vocal Ensemble.** Participation in a chamber or large ensemble for purposes of studying and performing literature in the field of the vocal music other than solo literature. Includes madrigal groups, choral ensembles, women's chorus, etc. CE
- 568-2 to 8 Opera Workshop.** An intensive course in opera for voice majors, including the study and public performances of scenes and entire operas. C
- 599-3 to 9 Thesis.** C

APPLIED COURSES

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|----------------------------------|---|----------------------------------|---|
| 440a-2 to 4 Private Violin. | E | 540a-2 to 4 Private Violin. | E |
| 440b-2 to 4 Private Viola. | E | 540b-2 to 4 Private Viola. | E |
| 440c-2 to 4 Private Violoncello. | E | 540c-2 to 4 Private Violoncello. | E |
| 440d-2 to 4 Private String Bass. | E | 540d-2 to 4 Private String Bass. | E |
| 440e-2 to 4 Private Flute. | E | 540e-2 to 4 Private Flute. | E |
| 440f-2 to 4 Private Oboe. | E | 540f-2 to 4 Private Oboe. | E |
| 440g-2 to 4 Private Clarinet. | E | 540g-2 to 4 Private Clarinet. | E |
| 440h-2 to 4 Private Bassoon. | E | 540h-2 to 4 Private Bassoon. | E |
| 440i-2 to 4 Private Saxophone. | E | 540i-2 to 4 Private Saxophone. | E |
| 440j-2 to 4 Private Percussion. | E | 540j-2 to 4 Private Percussion. | E |
| 440k-2 to 4 Private Piano. | E | 540k-2 to 4 Private Piano. | E |
| 440l-2 to 4 Private French Horn. | E | 540l-2 to 4 Private French Horn. | E |
| 440m-2 to 4 Private Trumpet. | E | 540m-2 to 4 Private Trumpet. | E |
| 440n-2 to 4 Private Trombone. | E | 540n-2 to 4 Private Trombone. | E |
| 440o-2 to 4 Private Tuba. | E | 540o-2 to 4 Private Tuba. | E |
| 440p-2 to 4 Private Baritone. | E | 540p-2 to 4 Private Baritone. | E |
| 440q-2 to 4 Private Voice. | E | 540q-2 to 4 Private Voice. | E |
| | | 540r-2 to 4 Private Organ. | E |
| 440r-2 to 4 Private Organ. | E | | |
| 471-2 to 8 Private Piano. | C | 571-4 to Private Piano. | C |
| 472-2 to 8 Private Voice. | C | 572-4 to 16 Private Voice. | C |
| 473A-2 to 8 Private Violin. | C | 573A-4 to 16 Private Violin. | C |
| 473B-2 to 8 Private Viola. | C | 573B-4 to 16 Private Viola. | C |
| 473C-2 to 8 Private Cello. | C | 573C-4 to 16 Private Cello. | C |

473D-2 to 8 Private String Bass.	C	573D-4 to 16 Private String Bass.	C
474A-2 to 8 Private Flute.	C	574A-4 to 16 Private Flute.	C
474B-2 to 8 Private Oboe.	C	574B-4 to 16 Private Oboe.	C
474C-2 to 8 Private Clarinet.	C	574C-4 to 16 Private Clarinet.	C
474D-2 to 8 Private Bassoon.	C	574D-4 to 16 Private Bassoon.	C
474E-2 to 8 Private Saxophone.	C	574E-4 to 16 Private Saxophone.	C
475A-2 to 8 Private Trumpet.	C	575A-4 to 16 Private Trumpet.	C
475B-2 to 8 Private French Horn.	C	575B-4 to 16 Private French Horn.	C
475C-2 to 8 Private Baritone.	C	575C-4 to 16 Private Baritone.	C
475D-2 to 8 Private Trombone.	C	575D-4 to 16 Private Trombone.	C
475E-2 to 8 Private Tuba.	C	575E-4 to 16 Private Tuba.	C
476-2 to 8 Private Organ.	C	576-4 to 16 Private Organ.	C
477-2 to 4 Private Percussion	C	577-2 to 16 Private Percussion.	C

PHILOSOPHY

406-4 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. Prerequisites: 300 or 320, and three laboratory or field courses in the biological sciences or consent of instructor. C

415-3 Logic of the Social Sciences. Logical and epistemological examination of the social studies 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. C

420-4 Advanced Logic. A careful study of symbolic and discursive systems of logic: Aristotle, Spinoza, Boole, Whitehead, and Johnson. Prerequisites: 320 and consent of instructor. C

426-6 (3,3) Mathematical Logic. (See Mathematics 326.) C

428-3 Logic of the Exact Sciences. Critical study of the technical and philosophical problems associated with formal logic and its uses as a tool for model construction, for formalizations, reconstructions, and as an image of rational thought. Prerequisites: 426-6 or consent of instructor. C

441-4 Philosophy of Politics. (Same as Government 441.) 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: GSC 102 or 340 or consent of instructor. C

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. CE

460-4 Advanced Philosophy of Art. The definition of art, its relations to science, culture, and morals; the various types of art defined. Familiarity with at least one of the fine arts is assumed. Prerequisites: GSC 207 or 360, and six courses in music, painting, sculpture, literature, or drama. C

477-4 Latin American Philosophy. A survey of philosophic thought in Latin America from colonial times through nineteenth century positivism and the reactions against it, up to recent trends. Reading of original texts in English translations. Discussions and reports. C

478-4 Seminar in Latin American Thought. (See Spanish 478.) C

481-6 (3,3) 19th Century European Philosophy. (a) Kant, Schopenhauer, and Hegel. (b) Nietzsche, Bergson, the Utilitarians, and latter day idealists. May be taken singly and in any sequence. C

482-3 Recent European Philosophy. Phenomenology. Positivism, Linguistic Analysis, and Existentialism. C

484-12 (4,4,4) History of Western Political Theory. (a) Ancient and Medieval.

(b) Renaissance and Rationalist. (c) Contemporary. Any part may be taken alone. E
 487-4 **American Political Ideas.** An historical study of the political ideas of leading American statesmen and publicists, and their resulting influences upon our government system. E

490-2 to 12 **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. Consent of instructor in all cases required. CE

500-2 to 4 **Seminar in Metaphysics.** Study of recent writers and current problems in metaphysics with the intent of familiarizing the student with the traditional problems of the area. C

501-2 to 4 **Seminar in the Philosophy of Religion.** Analysis of a selected problem in philosophical theology or the phenomenology of religion, or of the work of a particular thinker. Recent seminars have been on Paul Tillich and Henry Nelson Wieman. C

515-3 **Theory of Nature.** A critical examination of the presuppositions of the Western view of nature as indicating the need for a revision of causal determinism and the re-introduction of freedom into the spatio-temporal world. C

530-2 to 4 **Seminar in Theory of Knowledge.** Examination of a contemporary writer or problem in epistemology. Special emphasis is given to the problem of the reliability and structure of scientific knowledge. C

540-3 **Philosophy of Journalism.** (See Journalism 540.) C

570-3 **Seminar in American Idealism.** C

581-2 to 4 **Seminar in Plato.** A thorough study of several of the dialogues. Lectures on the system of Plato as a whole, discussions and reports on the readings. C

582-2 to 4 **Seminar in Aristotle.** The philosophic ideas of Aristotle. Intensive reading of several texts, illustrating widely varied portions of his thought. C

585-3 **Seminar in British Empiricism.** C

586-2 to 4 **Seminar in Spinoza.** Analysis of the *Improvement of the Understanding* and the *Ethics*. Lectures relating Spinoza to the medieval tradition and to his contemporaries. Discussions and reports. C

587-3 **Seminar in Hegel.** C

588-2 to 4 **Seminar in Kant.** The three great *Critiques* in their relation to the development of Kant's total philosophy. Intensive study of one of the *Critiques*. C

589-2 to 12, 590-2 to 12. **General Graduate Seminar.** For students having special interests in the history of philosophy and the original systematic development of philosophic ideas. Prerequisite: consent of instructor. C

591-1 to 5 **Readings in Philosophy.** Supervised readings for qualified students. Consent of instructor required. C

599-2 to 9 **Thesis.** Minimum of 5 hours to be counted toward a master's degree. C

600-3 to 48 **Dissertation.** C

PHYSICAL EDUCATION

400-4 **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. C

402-3 **Organization and Administration of Intramural and Extramural Activities.** Planning intramural programs of sports; planning and co-ordinating extramural activities commonly associated with physical education. CE

403-4 **The Adaptation of Physical and Recreational Activities to the Handicapped Individual.** Recognition of postural deviations; devising and planning programs for the physically atypical. C

404-4 The Teaching of Sports. Teaching methods, officiating, organization, safety precautions, and selecting equipment for sports. C

405-4 Current Theories and Practices in the Teaching of Dance. History and evolution of dance; place of dance in education. C

406-4 Basic Concepts of Physical Education. The place of physical education in the school program, and the concepts underlying the program. (Required of all students not presenting the undergraduate courses 354 or 340.) C

408-2 to 4 Workshop: 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. C

420-4 (C); 420-3 (E) Physiologic 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. Prerequisite: Physiology 209 or equivalent. CE

500-4 Techniques of Research. Critical analysis of research literature; study of research methods and planning research studies. Prerequisite: 400 or concomitant registration in 400. C

501-4 Curriculum in Physical Education. Principals 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. CE

502-4 Foundations of Motor Skills. Application of physiological, kinesiological, and mechanical principles to intelligent control of large-muscle activities. Recommended background: a course in kinesiology. CE

503-4 Seminar in Physical Education. The course content and its procedures center around group discussions of controversial issues that currently exist in physical education and provide opportunities for practice in seeking unbiased solutions to professional problems. CE

504-4 Problems in Physical Education. Planning, conducting, and reporting original research studies. Prerequisite: 500 or equivalent (C); consent of instructor (E). CE

507-4 Scientific Basis of Athletic Training. Study of the factors which affect maximum human performance in athletic competition. The knowledge and application of scientific principles in preparing the athlete for maximum performance, in shielding him from possibly damaging sequelae, and in restoring him to maximum performance after injury. Consideration of the kinesiological, physiological, and behavioral factors in athletics. Designed to increase the effectiveness of physical education personnel in teaching and coaching athletics. C

508-3 Administration of Interschool Athletics. Existing problems in interschool athletics, with particular attention to secondary school athletic programs. C

509-4 Supervision of Physical Education. The functions of supervision in physical and health education; basic principles and methods of supervision. Techniques and methods for increasing the effectiveness of the program at the elementary and high school levels. C

510-4 (2,2) Motor Development. (a) Early patterns of motor behavior and the development of physical skills in childhood. (b) 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. C

511-2 Analysis of Human Physical Movement. Basic human movements as performed by individuals of different ages will be analyzed and understanding of motor development varying levels of skill in sports and dance will be analyzed. C

525-1 to 6 Readings in Physical Education. Supervised reading in selected subjects. Prerequisite: consent of instructor and chairman of department. Open only to last-quarter seniors and graduate students. CE

599-2 to 9 Thesis. Minimum of 5 hours to be counted toward a master's degree. C

600-2 to 48 Dissertation. Minimum of 36 hours to be earned for the Ph.D. degree. C

PHYSICS

404-3 Introduction to Statistical Mechanics. A brief treatment of the kinetic theory of gases; introduction of phase spaces and ensemble theory. Shows the connection between mechanical and thermodynamic concepts. Obtains a statistical interpretation of thermodynamic processes. Prerequisites: 301, 304 or consent of instructor. CE

405-5 Electronics. The physics of vacuum tubes and semiconductor devices. Elementary theory and application of vacuum tubes as circuit elements in power supplies, oscillators, amplifiers, and shaping circuits. Laboratory. Prerequisites: 305; Mathematics 305a or consent of instructor. C

410-5 Physical Optics. A theoretical and experimental study of light as electromagnetic energy; its production, detection, and measurement. Laboratory. Prerequisites: Mathematics 252b and three advanced physics courses. C

413-8 (4,4) Atomic Physics. A general survey of modern physics including relativity theory, quantum theory, atomic structure and spectra, and wave mechanics. Prerequisites: 301, 305; Mathematics 305a or consent of instructor. C

414-5 Nuclear Physics. Basic properties of nuclei, systematics of nuclear stability, radioactive decay; alpha, beta, and gamma ray spectroscopy, nuclear reactions, models of the nucleus, neutron physics and elementary particles. Prerequisite: 413. C

415-12 (4,4,4) Modern Physics. Elements of wave mechanics, atomic and nuclear physics, fundamental particles, superconductivity, and solid state. Must be taken in a,b,c sequence. Prerequisite: 300; 9 hours of mathematics numbered 300 or above. E

418-1 to 4 Modern Physics Laboratory. E

420-2 to 9 Special Projects. Each student is assigned to a definite investigative topic. Adapted to advanced undergraduate students. Prerequisites: 301, 305. CE

425-5 Electrical Phenomena in Gases. Excitation and ionization of gas atoms; diffusion of ions; space charge; glow and arc discharges. Prerequisite: 305. C

430-2 Physical Literature. A study of source materials in the field of physics. Also library search on special subjects. Prerequisite: integral calculus, three advanced physics courses, and one-year of foreign language. CE

450-5 (C); 450-3 (E) Introduction to Solid-State Physics. A study of the fundamentals of solid-state physics including classification of solids, interatomic and intermolecular forces, lattice energies, specific heats, lattice dynamics, free electron theory of metals, lattice defects, color centers, luminescence, magnetic materials, radiation damage, transport in ionic crystals. Fermi-Dirac statistics, Fermi distribution, and semiconductors. Prerequisites: 305, 413; 304 or consent of instructor. CE

501-15 (5,5,5) (C); 501-15 (3,3,3,3,3) (E) Methods of Theoretical Physics. Classical theoretical physics; devoted about equally to advanced dynamics and electrodynamics including radiation theory. Prerequisites: 301, 305; Mathematics 305. CE

511-12 (4,4,4) Mathematical Methods of Physics. Vector analysis and curvilinear co-ordinate systems, partial differential equations of classical physics, expansions in orthogonal functions, boundary value problems, introduction to complex analysis, contour integration, linear transformations, and matrices, eigenvalue problems, integral equations and transforms, Schrödinger's equation and elementary quantum mechanics. Prerequisites: 413, Mathematics 305 or consent of instructor. C

520-2 to 5 Special Projects. Each student assigned a definite investigative topic requiring resourcefulness and initiative. Prerequisite or corequisite: 501. C

531-9 (3,3,3) Quantum Mechanics. Continuation of development of nonrelativistic quantum theory: wave functions as two-component spinors, identical particles and exchange interactions, Bose and Fermi statistics, atomic structure and fine structure, theory of scattering, motion in an external electromagnetic field, Stark and Zeeman effects. Relativistic quantum theory: Klein-Gordon and Dirac equations, relativistic electron theory, introductory quantum electrodynamics. Prerequisite: 511c. C

555-6 (3,3) Materials Structure Analysis. (a) X-ray diffraction techniques; (b) crystal structure analysis. C

590-1 to 9 Thesis. 1-5 hours each term. Prerequisite or corequisite: 501. Minimum of 5 hours counted toward a master's degree. C

PHYSIOLOGY

410-15 (5,5,5) Advanced Anatomy. Dissection of the human body. Primarily for majors in physiology and other biological sciences. Not a premedical course. 2 hours lecture, 6 hours laboratory. C

414-4 Anatomy and Physiology of Speech and Hearing Mechanisms. The anatomy and physiology of the vocal apparatus. Primarily for majors in speech pathology. 3 hours lecture, 2 hours laboratory. C

415-8 (4,4) Experimental Animal Surgery. Preparation of animals for surgery. Anesthesia, instruments, care of animal quarters, selected exercises. 2 hours lecture, 4 hours laboratory. Part b may be elected independently of a, only by permission of the chairman. C

417-6 (3,3) Principles of Pharmacology. Action of drugs and other chemical substances upon the living organism. Physiological and biochemical events resulting from the action of drugs. Pharmacodynamics, chemo-therapy, toxicology, and therapeutics. Prerequisites: basic courses in chemistry and biological sciences. 2 hours lecture, 2 hours laboratory. C

430-12 (4,4,4) Cellular Physiology. The nature and mechanism of the living cell. Chemical and physical aspects of vital activity. Required for graduate majors in physiology. Recommended for students interested in biochemistry and biophysics. 3 hours lecture, 2 hours laboratory. CE

433-4 Comparative Physiology. Fundamental physiological processes and the manner in which they vary in various groups of animals. Recommended for majors in physiology and for students in other biological science. 2 hours lecture, 2 hours laboratory. CE

440-3 Electron Microscopy. Lectures, demonstrations, and practical experience with the electron microscope. Fundamentals of specimen preparation. Open to students with advanced knowledge of any natural or physical science. 2 hours lecture, 2 hours laboratory. C

450-4 to 16 Special Problems in Physiology. Selected problems in various aspects of physiology. 8 hours laboratory. Open only by permission. C

455-2 Physiological Problems in Rehabilitation. Designed specifically for the rehabilitation counseling program. Problems of the handicapped. 2 hours lecture. C

460-12 (4,4,4) Mammalian Physiology. Function and biochemical organization in mammals, especially man. Open to students with adequate courses in biological sciences and chemistry. (a) blood, circulation, respiration. (b) digestion, excretion, endocrines. (c) nervous system sense organs. 3 hours lecture, 4 hours laboratory. CE

500-1 to 9 Advanced Seminar. One meeting per week, 1 credit per quarter. Formal presentation of research and/or current literature in physiology. Required of all majors each quarter in residence. C

519-3 Experimental Pharmacology. Exercises to familiarize the student with advanced physiological investigation. Prerequisite: strong background in chemistry and the biological sciences. 2 hours lecture, 2 hours laboratory. C

520-12 (4,4,4) Physiological Technics. (a) Analysis of protoplasmic components of tissue extracts under a variety of physiological conditions using chemical and physical procedures. (b) Gas analysis and metabolic methods in physiology. (c) Instrumentation for the recording of the physiologic activity of living tissues and organs. Use of channel recorders. Prerequisite: undergraduate concentration in any of the biological or physical sciences. 2 hours lecture, 4 hours laboratory. C

521-1 to 6 Readings in Current Physiological Literature. Open only by consent. C

550-3 Radiation Biology. Theory and specific applications of isotopes in physiology emphasized, and opportunity given to learn how to handle radioactive materials in the laboratory. 2 hours lecture, 2 hours laboratory. Prerequisites: general physics, biochemistry or equivalent. C

599-3 to 9 Thesis. 9 hours to be counted toward a master's degree. C

600-4 to 36 Doctoral Dissertation. A maximum of 36 hours may be counted for the doctor's degree. C

PLANT INDUSTRIES

401-4 Soil Physics. Physical properties of the soil; factors affecting them, their measurements, evaluation, and their influence in determination of soil productivity. Prerequisite: 103 or 301. C

402-4 Soil Morphology and Classification. Morphology and soil formation, description and identification of soil profiles, classification of soils, techniques of soil mapping, and interpretation of survey data. Field trips cost not more than \$10. Prerequisite: 103 or 301. C

404-3 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. Field trips cost not more than \$2. Prerequisite: GSA 201b or equivalent. C

406-4 Radioisotopes, Principles and Practices. Lectures on the principles of radioisotope technology as applied to agricultural and biological sciences. Prerequisites: biochemistry, physiology or consent of department. C

407-5 (3,2) Fertilizers and Soil Fertility. (a) Lecture. The uses of fertilizer materials; effects of various fertilizers on soils and crops; fertility maintenance and soil management. Prerequisite: one course in soils. (b) Laboratory. The laboratory study of the chemistry and fertility of soils. Parallels the theoretical presentation given in 407a. Prerequisite: 407a or concurrent enrollment. C

408-4 World Crop Production. Ecological and physiological considerations used in the interpretation of crop research data, with emphasis on modern developments and trends in production and research of major agronomic crops. Prerequisite: 309. C

418-4 Weeds and Their Control. Losses due to weeds, their identification and distribution, methods of weed dissemination and reproduction. Mechanical, biological, and chemical control of weeds. "Bioactivity of herbicides." State and federal legislation pertaining to weed control herbicides. Herbicide commercialization. Field trips. Prerequisite: GSA 201b. C

419-4 Forage Crop Management. Forage production and utilization; forage crop characteristics, breeding, and ecology; grasslands as related to animal production, soil conservation, crop rotation, and land use. Prerequisite: GSA 201b. C

424-5 (3,2) Soil Microbiology. (a) (Lecture). (Same as Microbiology 424.) A study of the numbers, characteristics, and biochemical activities of soil microorganisms, with particular consideration of their role in the transformations of organic matter, nitrogen, and minerals as related to soil fertility and management. Prerequisite: one course in microbiology or soils. (b) (Laboratory). Experiments designed to determine numbers, and to study the characteristics and biochemical activities of the soil microflora as related to fertility. Prerequisites: 424a, or concurrent enrollment, Microbiology 301. C

438-3 Advanced Vegetable Crops. Studies of the genetic, morphological, and physiological factors influencing the production of vegetable crops. Prerequisite: GSA 201b or equivalent. C

440-3 Plant Propagation. Fundamental principles of asexual and sexual propagation of horticultural plants. Actual work with seeds, cuttings, grafts, and other methods of propagation. Prerequisites: 264, GSA 201b, or consent of department. C

456c-2 Agricultural Marketing Problems and Practices—Field Crops. (See Agricultural Industries 456c.) C

456e-2 Agricultural Marketing Problems and Practices—Horticultural Crops. (See Agricultural Industries 456e.) C

506-2 Laboratory Methods for Radioisotopes. Laboratory exercises giving the students experience in instrumentation, measurements, and the safe handling of isotopic materials. Prerequisite: 406 or consent of department. C

507-3 Advanced Soil Fertility. Theoretical principles of soil fertility; evaluation of research data and methods used in soil fertility research. Prerequisite: 407a. C

520-1 to 6 Readings. Contemporary books and periodicals on selected subjects

within the fields of plant industries. Prerequisite: consent of department. C
575-1 to 6 Research. Directed research on approved projects investigating selected fields of the plant industries. Prerequisite: consent of department. C
581-1 to 6 Seminar. Group discussions of and individual papers on subjects and problems relating to soils, field and horticultural crops, and other phases of the fields of the plant industries. Prerequisite: consent of department. C
599-2 to 9 Thesis. Minimum of 5 hours to be counted toward a master's degree. Prerequisite: consent of department. C

PSYCHOLOGY

404-4 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: 211b or consent of instructor. C
406-4 Learning Processes. Processes by which individual behavior is changed, using procedures developed in the learning laboratory. Introduction to major concepts and data of learning. Prerequisite: consent of instructor. C
407-4 Theories of Learning. A consideration of the major contemporary learning theories and their relation to experimental data. Prerequisite: 211b or consent of instructor. CE
408-4 Theories of Motivation. An examination of instinct theories, biological drives, emotions, social motives, and psychodynamic theories as they contribute to a comprehensive psychology of motivation. Prerequisite: 211b or consent of instructor. C
409-4 History and Systems. Study of the important antecedents of contemporary scientific psychology. Considers issues, conceptual developments, and research advances, and presents the major schools and systems. Prerequisite: signed consent of psychology adviser. CE
420-4 Scientific Methodology in Psychology. Scientific methodology as an approach to investigation and classification of problems involved in understanding the psychological nature of man. Prerequisite: consent of instructor. C
421-4 Psychological Tests and Measurements. Principles of psychological measurement, including errors of measurement, techniques for estimating reliability and validity, techniques of test construction, and problems in assessment and prediction. The laboratory will include the use of selected instruments. Lecture and laboratory. Prerequisite: 8 hours of psychology. CE
424-4 Psychophysical Methods. Survey of the major psychophysical methods, and their applications. Lecture and laboratory. C
431-4 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. CE
432-4 Mental Hygiene. An integration of psychological knowledge and principles concerning factors and conditions affecting the individual which tend to facilitate or deter mental health. Prerequisite: 305 or consent of instructor. CE
437-3 Fundamentals of Counseling. Introduction to the common assumptions, dimensions, and communicative skills underlying psychological counseling. Prerequisite: 305 or consent of instructor. E
440-4 Theories of Personality. A review and critical evaluation of major personality theories and their supporting evidence. Prerequisite: 305 or consent of instructor. CE
451-4 Advanced Child Psychology. An examination of the concepts, methods, and problems of human development with consideration of both its psychological and psychosocial aspects. Prerequisite: 301 or 303 or consent of instructor. C
461-4 Advanced Social Psychology. Examines current areas of interest in the study of social behavior: language behavior, communication, social influence, attitude change, interpersonal perception, etc. Emphasis is on the individual in the social context. Prerequisite: 307 or consent of instructor. C
465-4 Group Dynamics and Individual Behavior (C); 465-4 Group Dynamics (E). Examination of research and theory in the area of small-group interaction. Examines

such topics as group structure and function, group problem-solving, leadership, etc. Prerequisite: 307 or consent of instructor. CE

471-4 Work Methods and Measurement. A study of the analysis and evaluation of jobs and the measurement of work performances by the use of standard time tables. Prerequisite: 320 or consent of instructor. C

479-4 Psychology of Industrial Conflict. Consideration of social and psychological factors underlying controversies between workers and management. Prerequisite: 320 or consent of instructor. E

490-1 to 16 Independent Projects. Independent readings and projects in psychology. Prerequisite: consent of instructor and chairman. CE

495-1 to 18 Seminar: Selected Topics. Varied content. To be offered from time to time as need exists and as faculty interest and time permit. Prerequisite: consent of department. C

501-12 (4,4,4) Proseminar in General Psychology. Basic conceptual and methodological problems in the study of behavior. (a) History and systems of psychology, philosophy of science, scientific methodology, behavior theory. (b) Acquisition of behavior, sensory and perceptual processes, motivation and emotion. (c) Personality and individual differences, new conceptual and methodological developments and trends. To be taken in sequence. Prerequisite: consent of instructor. Open to students in other areas by arrangement with chairman. C

509-4 Instrumentation in Behavioral Science. Study of methods of research instrumentation. Techniques of stimulation and of physiological and psychological response recording. Lecture and laboratory. Prerequisite: consent of instructor. C

512-4 Sensory Processes. A study of the structure and functions of the sense organs. Emphasis will be placed on the psychological data which describe the function of these organs. Lecture and laboratory. Prerequisite: consent of instructor. C

514-8 (4,4) Physiological Psychology. Study of neural and endocrine mechanisms underlying behavioral processes. Lecture and laboratory. Prerequisite: consent of instructor. C

520-4 Research Design and Inference I. C

521-4 Research Design and Inference II. C

522-4 Research Design and Inference III. The design and analysis of psychological experiments. Analysis of variance in complex designs, analysis of covariance, and trend analysis. Prerequisite: Mathematics 411 (or Mathematics 410B). C

523-2 Research Seminar. Major methods of obtaining data, use of computational and laboratory equipment, planning of research projects. Every student will be expected to submit a detailed research prospectus for group criticism. Prerequisite: 522. C

524-4 Advanced Research Methodology. A detailed coverage of psychometric methods, with special emphasis on the theory and applications of multivariate regression analysis. Includes an introduction to factor analysis. Prerequisite: 522. C

525-4 Mental Test Theory. Derivation of the basic psychometric equations, effects of test length and group heterogeneity on test parameters, criteria of parallel tests, weighting and differential prediction. Prerequisite: 524. C

530-4 Personality Theory and Dynamics. Intensive treatment and critical analysis of several representative approaches to personality. Consideration also of important personality concepts common to most theoretical approaches. Prerequisite: consent of instructor. C

531-2 to 4 Advanced Psychopathology. Consideration of special topics, including psychological theories of the nature and etiology of human pathology, assessment of pathology, and institutional care and treatment. Includes extensive field experience in a mental hospital setting. Prerequisite: 530, 541, 541b, and consent of instructor. C

532-2 Experimental Approaches to Personality. Presentation of conceptual formulations and research data from representative experimental approaches to personality. Critical evaluation of methodological approaches to personality study. Prerequisite: 530 or consent of instructor. C

533-3 Experimental Approaches to Psychopathology. An examination of the research literature on several issues in clinical psychopathology. Prerequisite: consent of instructor. C

536-4 Fundamentals of Counseling. Introduction to the common assumptions, dimensions, and communicative skills underlying psychological counseling. Observation utilized to supplement didactic discussion. Lecture and demonstration. Prerequisite: consent of instructor. C

537-4 Counseling and Psychotherapy. Systematic presentation of major approaches to counseling and psychotherapy. Consideration of salient aspects of the therapeutic situation and of the process and nature of changes during psychotherapy. Critical evaluation of both theory and practice. Consideration of research findings and problems. Prerequisite: 530 and consent of instructor. C

538-2 Group Psychotherapy. Presentation of major approaches to group psychotherapy. Prerequisite: 537 and consent of instructor. C

541-6 (4,2) Psychodiagnostics I. Introduction to clinical psychology with attention to the function and clinical use of individual intelligence tests. Theories of intelligence and related research. (a) age scales with emphasis on infant and child testing. (b) point scales and tests of deterioration with emphasis on child and adult testing. Lecture and practicum. Prerequisite: Mathematics 410 and consent of instructor. C

543-6 (4,2) Psychodiagnostics II. Basic theory and assumptions underlying projective methods. Use of projective techniques as measures of personality and as tools for clinical diagnosis and research. (a) thematic projective techniques. (b) Rorschach and Bender-Gestalt. Lecture and practicum. Prerequisite: 541b or consent of instructor. C

545-2 Psychodiagnostics III. Nature and theory of questionnaires for personality assessment and psychodiagnostics. Consideration of their use in clinical research. Lecture and practicum. Prerequisite: consent of instructor. C

546-3 to 4 Psychodiagnostics for Special Populations. Tests used in diagnostics and measurement of special populations such as retarded, blind, deaf, brain injured, and the like. Lecture and laboratory. (Same as Special Education 573.) Prerequisite: consent of instructor. C

547-2 Assessment Procedures in Counseling. Use and integration of psychological test data, vocational, socio-economic, and educational information in assessment and counseling. Prerequisite: 421 or consent of instructor. C

552-4 Experimental Child Psychology. Consideration of relationship of methodology to child theory, typical methodological procedures and problems specific to children, and representative research topics. Prerequisite: 451 or consent of instructor. C

554-2 Developmental Theory. Systematic study and critical evaluation of representative theories of child behavior. Prerequisite: 451 or consent of instructor. C

556-2 Psychological Treatment of the Child. Investigation of personality and behavior problems. Etiological factors and methods of treatment. Prerequisite: 451 or consent of instructor. C

561-4 Social Influence Processes. Critical review of theoretical and empirical developments in the study of influence processes, attitude change, etc. Social and intra-personal determinants are examined. Prerequisite: 461 or consent of instructor. C

562-4 Observational Techniques and Content Analysis. Examination and evaluation of research methods and measurement techniques utilized in social psychology. Prerequisite: 461 or consent of instructor. C

564-4 Communication and Group Behavior. Emphasis in this course is on language behavior and the psychological study of the communication process. Examines theories, methods and research in these areas. Prerequisite: 471 or consent of instructor. C

571-4 Industrial Motivation and Morale. A review of the factors which determine motivation and morale as well as their measurement and evaluation. Prerequisite: 320 or consent of instructor. C

572-4 Industrial Training. A systematic consideration of the methods of industrial training and development on the production, supervision, and decision-making levels. Prerequisite: 320 or consent of chairman. C

573-2 Selection and Placement. (a) Selection and validation of test batteries, use of the interview and personal history data in selection, quota, and classification problems, administration of a selection program. (b) Methods of evaluating employees' proficiency and criterion development. Also, a brief introduction to scaling proce-

- dures. Must be taken in a,b sequence. Prerequisite: 524 or consent of instructor. C
- 574-2 Psychology of Industrial Relations.** Analysis of psychological factors involved in industrial organization, employer-employee relations, and union-management relations. Prerequisite: 571 or consent of instructor. C
- 576-2 to 4 Human Engineering.** Analysis of man-machine systems, human factors in the design of display and control systems, limitations and capabilities of the human operator. Prerequisite: consent of department. C
- 590-1 to 16 Readings in Psychology.** Readings in selected topics in psychology under staff supervision. Prerequisite: consent of department. C
- 591-1 to 36 Research in Psychology.** Research under staff supervision in selected areas of psychology. Prerequisite: consent of the department. C
- 593-1 to 18 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, (k) Community Health Psychology, (l) Teaching of Psychology, (m) Rehabilitation Counseling. C
- 595-1 to 18 Advanced Seminar.** Seminars of varied content for advanced students. Prerequisite: consent of department. C
- 598-2 Ethical and Professional Problems in Psychology.** Problems in the professional practice of psychology and in teaching and research. Professional ethics, relations to other professions and the public, organization and structure of the field, current trends. Prerequisite: major in psychology or consent of instructor. C
- 599-1 to 9 Thesis.** C
- 600-1 to 36 Dissertation.** C

RECREATION AND OUTDOOR EDUCATION

- 413-4 Safe and Healthful Living Outdoors.** Areas to be included are foods, sanitation, survival, plants and animals, natural hazards, emergency care, water, riflery, and others. Prerequisites: 334, and at least 10 hours of biological sciences. C
- 425-4 Construction and Maintenance of Recreation Areas.** Principles of planning, construction, management and maintenance of shelters, utilities, sanitation, structures, erosion control, and other related problems. C
- 450-4 Principles and Interpretations of Recreation.** Principles of recreation in relation to education and everyday life. Basic concepts underlying the interpretation of recreation and leisure in the light of economic, psychological, political, and social conditions. C
- 470-4 Recreation in Public Education.** Emphasis on current practices and trends in curriculum content, adult education, extracurricular activities, after-school and vacation programs, and co-operative programs with other agencies. C
- 480-4 Techniques in Camping.** Preparation of material for use in camps; techniques of camp procedure, camp craft, woodmanship, and crafts. C
- 510-2 to 6 School Camping and Outdoor Education Workshop.** Current practices in school camps; the training of leaders for school camps and the place of outdoor education in the school program. C
- 520-4 Recreation Program Workshop.** Bases for planning community programs of recreation. Scope of leisure opportunities; selection, evaluation, and adaptation of activities. C
- 530-4 Organization for Community Recreation.** The development and administration of a recreation program. A study of community recreation, including developing facilities and co-ordinating community agencies. C
- 540-4 Recreation Surveys and Planning of Facilities.** An analysis of scope, content, objectives, procedures, and types of recreational surveys and appraisals. Collection and analysis of data. C
- 550-2 to 6 Field Problems in Community Recreation.** Internship in school recreation and outdoor education with emphasis on administrative problems. C
- 560-2 to 6 Field Problems.** Internship in school recreation and outdoor education with emphasis on administrative problems. C

SECONDARY EDUCATION

402-4 Aerospace Education Workshop. Teachers learn about current developments in this area and how to incorporate aerospace information into existing curricula. They study in some detail the social, political, and economic consequences of this era. Prerequisite: consent of instructor. C

407-4 The Junior High School. The place of the junior high school in the organizational pattern, with major emphasis upon the areas of organization, administration, and curriculum. CE

440-3 Teaching Reading in High School. A foundation course in how to teach reading in junior and senior high school: developmental and corrective reading programs; appraisal of reading abilities; methods and materials of instruction. Prerequisite: Guidance 305. C

450-4 to 16 Field Training in Community Development Methods. C

487-4 Teaching the Natural Sciences in Secondary Schools. Objectives of science education; instruction methods and techniques appropriate for teaching science; desirable equipment, audio-visual aids, and instructional material; development of a course outline and at least one instruction unit. Prerequisite: 315 or consent of instructor. E

488-3 Teaching Social Studies in Secondary Schools. Deals with objectives, scope and sequence of curriculum, methods of teaching different courses and age groups, materials and evaluation. Prerequisite: Guidance 305. CE

490-4 Workshop in Economics Education. (Same as Economics 490.) Designed to assist elementary and secondary school teachers in promoting economic understanding through the translation of economic principles and problems into classroom teaching materials. CE

505-4 Improvement of Reading Instruction. (See Elementary Education.) CE

507-2 to 4 Readings in Reading. CE

508-4 Seminar: Trends in Selected Areas in Secondary Schools. For students in advanced graduate work. Individual class members will read basic bibliography related to secondary education and read widely about trends in the area of their own teaching fields. Prerequisites: completion of half or more of the work leading to a master's degree and consent of the instructor. CE

509-4 to 8 Practicum in Reading. (See Elementary Education.) C

510-4 Seminar: Problems in Reading. (See Elementary Education.) C

514-4 Organization and Administration of Reading Programs. (See Elementary Education.) C

516-4 Internship in Reading. (See Elementary Education.) C

518-2 Supervision of Student Teachers. CE

521-9 (3,3,3) (C); 521-3 to 4 (E) Diagnosis and Correction of Reading Disabilities. (See Elementary Education.) CE

544-9 NDEA Summer Institute for Teachers of German. (See Foreign Languages.) C

550-4 Core Curriculum in the Secondary School. Designed to help students gain a functional understanding of the core concept. Techniques of selecting materials and the co-operative planning of units of work. Critical study of current practices in this field. Prerequisite: Educational Administration and Supervision 460. CE

560-1 to 8 New Developments in Technological Education. (See Industrial Education.) C

562-4 Workshop in High School Curriculum. Designed to permit students to work in groups on problems related to the high school curriculum. Such problems should originate in the schools where the students are or will be employed. The point of view maintained is that procedures should be very democratic. The instructor serves as a co-ordinator of activity; resource people are used freely. Prerequisite: one other graduate course in curriculum. CE

564-4 High School Principalship. Designed to deal with problems met specifically by the high school principal. Emphasizes his role in relation to guidance, curriculum,

schedule-making, extracurricular activities, public relations, budgeting of time, etc. Prerequisite: Educational Administration and Supervision 424 and consent of instructor. CE

570-4 Extra-Class Activities. E

575-2 to 4 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) Problems in Higher Education, (j) Problems in Junior College. CE

586-3 The Change Agent in Planned Change. An intensive diagnosis of the dynamics involved in planned change in a social system—using actual situations for study—and the consultant's relationship to this process. Prerequisite: Sociology 333 or consent of instructor. C

589-2 Seminar in Community Development. C

591-4 Workshop in Current Problems in Secondary Education. Designed primarily to help high school principals to work effectively and with the help of resource leadership on the most urgent problems confronting their schools. Discussion, reports, lectures, and final examination. Prerequisite: consent of instructor. CE

596-5 to 9 Independent Investigation. A field study required of each student working for the sixth-year professional certificate. The work should be done in the setting of a school system where the student is employed or where full co-operation is extended. The study will involve selecting of the problem, survey of pertinent literature, recording of results, and appropriate interpretations and summarizations. C

597-1 to 3, 598-1 to 3, 599-1 to 3 Thesis. Minimum of 5 hours to be counted toward a master's degree. C

600-1 to 48 Dissertation. Minimum of 36 hours to be earned for the Ph.D. degree. C

SECRETARIAL AND BUSINESS EDUCATION

403-3 Teaching Typewriting. The programming of activities in typewriting training, methods of instruction, skill-building principles and techniques, selection and preparation of practice materials, standards of achievement, and evaluation of pupil performance. Prerequisite: 201c or equivalent. CE

404-3 Teaching Shorthand and Transcription. The programming of activities in shorthand and transcription training, methods of instruction, skill-building principles and techniques, selection and preparation of practice and homework materials, standards of achievement, and evaluation of pupil performance. Prerequisite: 324a or equivalent. CE

405-3 Teaching General Business Subjects (C); 405-4 Teaching Basic Business Subjects (E). Instructional methods and materials for, and the evaluation of pupil progress in, such basic business subjects as general business, consumer education, economic geography, business law. CE

406-4 Teaching Office Practice and Office Machines. Instructional methods and materials for, and the evaluation of pupil performance in, office practice and office machines. CE

407-4 Office Management. The principles of management as applied to office problems. Emphasis on the role of the office in business management; office organization; physical facilities of the office; office services, procedures, standards, and controls; records management. CE

408-3 Teaching Bookkeeping and Accounting. Instructional methods and materials for, and the evaluation of pupil progress in, bookkeeping and accounting. Prerequisite: Accounting 251b or equivalent (C); none (E). CE

427-4 Records Administration. The requisites for records administration. The value of files, their creation, control, retention, and disposition. Applications to such records as medical, legal, educational. Prerequisite: 407. E

428-4 Systems and Procedures. A problems approach to the office systems-procedures function in the modern business firm; seminar and laboratory work on improvement

of systems and procedures, administrative information and paperwork engineering; theory of office-systems design; systems administration and work simplification. Prerequisite: 407 or consent of instructor. E

500-2 to 5 Readings in Business Education. Supervised readings in selected subjects. Prerequisite: consent of instructor (E). CE

501-2 to 5 Individual Research in Business Education. Selection and investigation of a problem; use of relevant sources and techniques; collection, evaluation, and interpretation of data; and the writing of a report on the investigation. Prerequisite: consent of instructor (E). CE

502-4 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. Prerequisite: Guidance 422b (E). CE

503-4 Tests and Measurements in Business Education. (See Guidance 503.) CE

504-4 Psychological Bases for Teaching Secretarial Skills. Findings of experimental research in human learning applicable to the learning of shorthand, typewriting, and other office skills. Treats the variables in skill-learning and modes of manipulating these variables for specific purposes; applies principles of learning to the evaluation and derivation of instructional procedures. Prerequisites: 403 or 404. C

505-1 to 6 Workshop in Business Education. Major issues in business teacher education. Ordinarily offered during one or two weeks of the summer session. CE

506-4 Principles and Problems of Business Education. A study of the fundamentals of business education; its relation to business, to general and vocational education, and to guidance programs; its history, current status, and trends; special emphasis on objectives and curriculum problems. CE

507-4 Application and Fundamentals of Data Processing in Business Education. Acquaints business teachers with data processing applications in high school business classes. Emphasis on vocabulary development, unit record equipment, concepts of programming and fundamentals of computer applications. Approximately one-third of the course will be spent in machine operation. E

599-1 to 9 Thesis. Minimum of 5 hours to be counted toward a master's degree. C

SOCIOLOGY

General Sociology: 400-2, 405-4, 407-4, 427-4, 450-4, 451-4, 501-4, 502-4, 503-4, 504-4, 505-4, 506-4.

Social Organization and Structure: 406-3, 435-4, 438-3, 449-4, 534-4, 537-4, 538-4, 539-4, 542-4, 543-4, 544-4, 545-4.

Social Psychology: 424-4, 426-4, 453-4, 521-4.

Social Disorganization and Control: 472-4, 561-4, 562-4, 563-4, 564-4, 566-4, 572-3.

Methodology: 412-5, 415-3, 519-4, 526-4, 527-4, 528-4, 529-4, 530-4, 531-4.

General Courses: 591-2 to 6, 596-2 to 6, 599-2 to 9, 600-36 to 48.

Social Work: 481-4, 482-3, 480-2, 484-3, 486-1 to 5, 487-4, 488-3, 586-3, 587-2 to 8.

Corrections: 483-2, 489A-3, 489B-4, 489D-3, 489E-2 to 4, 582-4, 583-4 to 12, 584-4.

400-2 Current Sociology. Students read, report on, and evaluate content of leading sociological journals. Prerequisite: 8 hours of sociology. C

405-4 Current Sociology. A survey of important trends in contemporary social thought. Students read, report on, and evaluate content of leading sociological journals. Prerequisite: 12 hours of sociology. E

406-3 (C); 406-4 (E) Social Change. Processes of social change in the modern world; culture lag and conflict of norms; individual and social problems arising from conflicting systems of social values and cultural norms. Prerequisite: 8 hours of sociology. CE

407-4 Integrated Sociology. Integration of sociological concepts and principles:

society and culture, the human group, social norms and patterns, status and role, organization, structure, and function, social change. Prerequisite: 15 hours of sociology. CE

412-5 Sociological Research. Introduction to methods of sociological research. Relations between theory and research design. Application of scientific methods to social data. Prerequisite: 12 hours of sociology or consent of instructor. C

415-3 Logic of the Social Sciences. (See Philosophy 415.) C

424-4 Collective Behavior. The behavior of people in large groups; collective inter-stimulation and emotions; crowds, audiences, and publics; mass stimuli and mass response. Prerequisite: 321 or 322, or consent of instructor. CE

426-4 Social Factors in Behavior and Personality. How group situations and values affect behavior and shape personality; development of concepts, role-concepts, attitudes, values; theories of motivation; self-concepts; conflicting social values in relation to individual motivation. Prerequisite: 321 or Psychology 305. CE

427-4 Personality and Social Adjustment. Basic mechanisms of adjustive behavior; concepts and criteria of personal integration and social adjustment; varieties of adjustive and non-adjustive behavior; theories of personal organization and disorganization; selected problems. Prerequisite: 321 or Psychology 305 or consent of instructor. CE

435-4 Social Stratification. A comparative study of social class systems, with emphasis on the American systems. Relationships of class position to behavior in family, religion, politics, etc. Prerequisite: GSB 201b. CE

438-3 Sociology of Occupations and Professions. Natural history and institutional aspects of occupations in our society, cultural context of occupations in both primitive and modern society, preparation for jobs, human values in work, promotion and discharge, mobility, retirement. Prerequisite: GSB 201b. C

449-4 Sociology of Aging. The social implications of an aging population; social adjustments to the aging process; personal adjustments to the roles and statuses of later maturity; a consideration of retirement and public assistance programs for older people. Prerequisite: GSB 201b or consent of instructor. C

450-4 Social Thought I: Before 1800. The ideological basis of Western society. The classical foundations. Trends of thought from the Renaissance to the Enlightenment. Prerequisite: background in history. CE

451-4 Social Thought II: The Sociological Movement. From Romanticism to Realism; rise and development of scientific social thought. Prerequisite: background in 19th century history or literature. CE

453-4 Social Movements. A sociological study of modern social movements; social and cultural backgrounds, forms of expression and organization; social structure of social movements, their role and function in modern society. Prerequisite: 8 hours of sociology. CE

470c-4 Urban Planning. (See Government 470.) E

471-4 Principles of Demography. Techniques in analyzing and evaluating data on human population; composition, birth and death rates, life tables, migration data, estimates of future trend. Practical uses of demographic techniques. Prerequisites: 371, 412. C

472-4 Treatment and Prevention of Crime. Principles of penology; history of punishment and prisons; criminal law, police function, criminal courts; the prison community; the juvenile court and related movements. Prerequisite: 372. CE

480-2 History and Legal Aspects of Rehabilitation. A survey of historical and legal developments in rehabilitation agencies, with particular emphasis on current theories and trends. Open only to students in the Rehabilitation Institute. C

481-4 Processes in Social Work. Theory, rationale, and practice of casework, group work, social welfare organization, and the roles of supervision, administration, and research in relation to each. Case material study and discussion with field observation and practice. Prerequisite: 380 or consent of instructor. CE

482-3 (C); 482-4 (E) Social Work in Selected Agencies. Study of representative literature on casework in family, psychiatric, medical, school, military, child welfare, and correctional settings, and others. Case material study and discussion with field observation and practice. Prerequisite: 481. CE

483-3 Current Problems in Corrections. An exploration of contemporary problems in the control and treatment of sentenced offenders. Prerequisite: consent of instructor. **CE**

484-3 (C); 484-4 (E) Survey Course in Marriage Counseling. Survey and analysis of the field of marriage counseling; assessment of current practices and techniques in terms of contemporary sociological theory. Prerequisites: GSB 341, and consent of instructor. **CE**

485-6 Community Programs for the Prevention of Juvenile Delinquency. Analysis of delinquency prevention in community programs administered by the public schools, social welfare, governmental agencies. A study of the categories of juvenile delinquency is applied to a critique of existing programs and to the development of experimental programs. The roles of professional workers pertinent to such programs is delineated with special reference to the public school administration, counselor, the social workers, the court, probation officers, and police. Prerequisite: consent of instructor. **E**

486-1 to 5. Independent Study in Community Development. Individual study and projects designed to fit the needs of each student. Prerequisite: consent of instructor. **C**

487-7 (4,3) Community Development. (a) The concepts of community development and analysis of the social-psychological forces and processes involved in citizen study, planning and action directed toward the fuller development of communities in a democratic society. (b) Principles and procedures applicable to solving social problems in the context of a community development program. Laboratory period for field trips. Must be taken in a,b sequence. Prerequisite: 4 hours of sociology or equivalent. **C**

489A-3 The American Correctional System. A survey of the Correctional field covering probation, institutions, and parole; their historical development, organizational structure, program content, and current problems. **CE**

489B-4 Probation, Classification, and Parole. An introduction to the structure and function of those elements of the correctional process primarily concerned with the evaluation, treatment, and control of offenders with particular attention to the case-work components of the process. Prerequisite: 481 or consent of instructor. **CE**

489D-3 Problems in Correctional Research. The problems of designing and conducting research in correctional institutions and agencies, a review of research trends in corrections. Prerequisite: 483 or consent of instructor. **C**

489E-2 to 4 Independent Study in Corrections. Supervised readings or independent investigative projects in the various correctional aspects of crime control, institutional management, and specific correctional programs. Prerequisite: consent of instructor. **C**

501-4 Survey of Sociological Theory. The development of sociology as a science of society, from synthetic philosophy to analytic sociology. Prerequisite: 451 or consent of instructor. **C**

502-4 Seminar in European Sociological Theory: 1800-1910. The theoretical systems of selected European sociologists studied from the original writings. Prerequisite: 15 hours of sociology or consent of instructor. **C**

503-4 Seminar in European Sociological Theory: 1910 to the Present. A Continuation of 502. Prerequisite: 15 hours of sociology or consent of instructor. **C**

504-4 Seminar in American Sociology I: Foundations. Review of backgrounds and development of American sociology to World War I. Special attention to theory. Prerequisite: 15 hours of sociology or consent of instructor. **C**

505-4 Seminar in American Sociology II: The 2nd Generation. Development of American sociology, 1914-1942. Proliferation as an academic discipline and progress toward standardization of concepts and areas of investigation; discovery of culture and abandonment of instinctivism; neopositivism and the false antithesis between theory and research. Prerequisite: 15 hours of sociology or consent of instructor. **C**

506-4 Seminar in Contemporary Sociological Theory. An analysis of recent sociological theories, including a survey of current approaches to the construction and application of systematic theoretical models. Special attention will be given to "structural-

functional" analysis and to the theoretical adequacy of selected theory-oriented empirical research areas. Prerequisite: 15 hours of sociology or consent of instructor. C

519-4 Methodological Foundations of the Social Sciences. Social science methodology; the nature of social facts and phenomena, the formation of concepts, the application of logic in the social sciences. Prerequisites: 407, and Philosophy 420 or consent of instructor. C

521-4 Seminar in Social Psychology. Survey of theoretical systems; progress toward integrated body of behavioral theory. Prerequisite: 426. C

526-4 Quantitative Methods in Sociology I. Consideration of the nature and organization of empirical data, correlation and regression in the two variable cases, tests of significance, and general character of statistical inference. Prerequisite: 412 or consent of instructor. C

527-4 Quantitative Methods in Sociology II. Review of nonparametric techniques. An examination of the Hyman Method of multivariate analysis. Emphasis is given to statistical significance of partials. Prerequisite: 526 or consent of instructor. C

528-4 Quantitative Methods in Sociology III. Classical techniques of multivariate analysis. Simple analysis of variance, complex analysis of variance, partial correlation, and multiple regression equations. Prerequisite: 527 or equivalent. C

529-4 Sociological Measurement. A detailed coverage of techniques by means of which responses to questionnaire and interview as well as direct observation of behavior may be quantified. Includes the Parrallogram Technique, Unfolding Technique, methods based on the Law of Comparative Judgment and the Method of Single Stimuli. The validity, reliability, and equivalence of these techniques are also covered. Prerequisite: 412 or consent of instructor. C

530-4 Research Design. Types of research design. Formulation of a research problem. Ecological research methods. Case studies, types of experimental designs. Management of research projects. Types of sampling. Prerequisite: 527 or equivalent. C

531-4 Research Analysis. Content analysis. Classification, editing, coding, tabulation, and graphing. Analysis of descriptive research. Analysis of explanatory research. Errors and bias in research. Presentation of research findings. Prerequisite: 530 or consent of instructor. C

533-4 Ecology of Human Communities. Spatial and temporal organization of population and institutions with special reference to the organization of rural and metropolitan communities. Emphasis on basic research methods and current sources of data in respect to type, structure, and growth of the communities. Prerequisite: 15 hours of sociology or consent of instructor. C

534-4 Seminar in Intergroup Relations. Cross-cultural study of inter-ethnic and inter-faith relations, with special attention to conflict, accommodation, acculturation and assimilation. Prerequisite: 15 hours of sociology or consent of instructor. C

535-4 Race and Education in American Society. An examination of the role of racial differences and racial relationships in the development of education philosophies and systems in the U.S. Both historical and sociological approaches are employed in assessment of social change and evaluation of educational institutions. Special attention given to changes during last half-century; contemporary race relations issues in public education are critically examined. C

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, social value systems and social change; consideration will be given to research in the field. Prerequisite: 15 hours of sociology or consent of instructor. C

538-4 Seminar in Industrial Sociology. Selected aspects of Industrial Organization and related problems including such topics as: functional and dysfunctional deviations from ideal bureaucracy, promotion policies, labor relations, job aptitudes, job satisfactions, and public relations. Prerequisite: 15 hours of sociology or consent of instructor. C

539-4 Sociology of Bureaucracy. Analysis of the structural characteristics and conditions for the emergence of bureaucratic and quasi-bureaucratic forms of organization. Attention to such problems as the bases of authority, stabilizing mechanisms, systems of formal and informal relations, rationality and paradox in bureaucratic

organization; impact of bureaucratic organization upon character structure and its role in the formation of classes and elites. Prerequisite: 15 hours of sociology or consent of instructor. C

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. CE

543-4 Seminar in Family Variability. 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. C

544-4 Seminar in Family Research. A detailed analysis of significant research in the field of the family. Special attention to methods employed as they relate to the specific problems investigated. Prerequisite: 15 hours of sociology including 340, or consent of instructor. C

545-4 The Family and Social Change. The significant social factors responsible for changes in the family from ancient times to present. Analysis of representative writings from several periods. Prerequisite: 15 hours of sociology including 340, or consent of instructor. C

561-4 Alcohol and Society. Analysis of the determinants of ranges of variation in drinking patterns, normal or pathological, viewed cross-culturally and in the context of complex society. Special consideration will be given to the following: the ecology of drinking and alcoholism, drinking patterns and social structure, drinking centered subcultures and institutions, as well as to the genesis and patterning of deviant drinking (alcoholism), responsive movements and systems of control. Prerequisite: consent of instructor. C

562-4 Deviance and Disorganization. Comparative study of the role of social, cultural, and psychological factors in the genesis of specific social pathologies exhibiting marked variation in group rates. Pathologies such as suicide, homicide, and alcoholism will be taken as illustrative. The strategic significance of the study of such phenomena for theories of social and personal disorganization, will be considered in detail. Prerequisite: 15 hours of sociology or consent of instructor. C

563-4 Research Problems in Deviance and Disorganization. For students who are concerned to develop viable research projects in the areas of social disorganization and deviant behavior. Students formulate and present original research prospectuses for critical evaluation. Consideration given to questions of theoretical relevance, research design, and appropriate techniques. Prerequisite: 15 hours of sociology or consent of instructor. C

564-4 Social Factors in Mental Disorders. An examination of the role of social organization and structure in the emergence of mental disorders. Consideration given to pertinent theoretical and research contributions. Prerequisite: 15 hours of sociology or consent of instructor. C

566-4 Community Organization and Disorganization. Nature of the community and community generating processes. Appraisal of consensus and allocation of power. Illustrative community case studies. C

572-3 Seminar in Criminology. Critical study of important research through book reviews and theoretical analyses. Prerequisite: 372 or consent of instructor. C

582-4 Criminal Law and the Correctional Process. A review of the 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. C

583-4 to 12 Supervised Field Work in Corrections. Experience in state and federal institutions, probation and parole departments, juvenile courts, delinquency control programs, and public or voluntary agencies. Students registering will be required to attend orientation sessions prior to actual placement; enrollment should be discussed considerably in advance of experience to facilitate arrangements with agencies. Prerequisite: consent of instructor. C

584-4 Seminar in Correctional Program Management. A critical analysis of management influence on treatment programs in various correctional settings. Field trips, observation, and research in addition to readings. C

- 586-3 The Change Agent in Planned Change.** (Same as Secondary Education 586.) An intensive diagnosis of the dynamics involved in planned change in a social system—using actual situations for study—and the consultant's relationship to this process. Prerequisite: 333 or consent of instructor. C
- 587-2 to 8 Individual Research in Community Development.** Research projects designed to meet the professional objectives of the individual student. Prerequisite: concentration in community development. C
- 591-2 to 6 Individual Research.** Supervised research projects. Open only to graduate students with a major in sociology. Prerequisite: consent of instructor and chairman of department. Credit according to achievement. C
- 596-2 to 12 Readings in Sociology.** Supervised readings in selected subjects. Prerequisite: consent of instructor and chairman of department. C
- 599-2 to 9 Thesis.** Before a thesis can be submitted, all departmental requirements, including language and comprehensive examinations, must be satisfied. Minimum of 5 hours counted toward a master's degree. C
- 600-1 to 48 Dissertation.** Prerequisite: consent of chairman. C

SPECIAL EDUCATION

- 406-4 Techniques and Interpretation of Hearing Tests.** (See Speech Correction 406.) C
- 410-4 Problems and Characteristics of the Mentally Retarded.** Objectives, curriculum, methods, and materials of instruction for slow learners. Emphasis upon the principles of learning as they can be applied to this group. Observations. Prerequisite: Guidance 305 or Psychology 301 or 303. CE
- 411-4 Education of the Partially Sighted and Blind.** A study of the objectives, curriculum, methods, and techniques of instruction of classes for the partially sighted. Special emphasis on sight conservation in the regular classroom, special equipment, and observation of sight-saving classes. Prerequisites: Guidance 305, Psychology 301 or 303. C
- 412-4 Education of Gifted Children.** Designed to help teachers in the identification of and programming for gifted and talented children. Prerequisite: Guidance 305 or Psychology 301 or 303. CE
- 413-4 Directed Observation of Exceptional Children.** Taken concurrently with a problem course in a specific area which provides student observation and participation in individual work with exceptional children. Prerequisite: consent of instructor. CE
- 414-4 The Exceptional Child.** 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. Individual case studies used; observations and field trips. Prerequisites: Guidance 305, Psychology 301 or 303. CE
- 415-4 Education of the Deaf and Hard of Hearing.** Methods of teaching reading and developing language sense in the deaf and hard of hearing. Tactile, visual, and kinesthetic experiences; hearing aids and other special equipment presented in terms of their educational application. Observations. Prerequisites: Guidance 305, Psychology 301 or 303, Speech 105 and 212, or equivalent. C
- 416-4 Education of Orthopedic Children.** Objectives, curriculum, methods, and techniques of instruction of classes for orthopedic children. Emphasis given to program organization, special types of equipment, and observation of classes for the orthopedic. Prerequisite: same as 410. C
- 417-4 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 methods of contact and cost. Visits made to agencies and institutions: specialists invited to appear before the class. Prerequisites: Guidance 305 or Psychology 301 or 303, and Sociology 101. C
- 418-4 Workshop in Special Education.** Designed to promote better understanding of the psychological and educational problems of atypical children. Specialists used as consultants. Open to seniors and graduate students majoring in education, guid-

- ance, or special education. Prerequisite: Guidance 305 or Psychology 301 or 303. CE
- 419-4 Communication Problems of the Deaf and Hard of Hearing.** (Same as Speech Correction 419.) Objectives and techniques for the teaching of lip reading, speech conservation, and auditory training. Prerequisite: 406 or consent of instructor. C
- 420-4 Methods and Materials for Teaching Exceptional Children.** Offered in conjunction with practice teaching, dealing with methods and materials needed in teaching specific types of exceptional children. CE
- 428-4 Speech Correction for the Classroom Teacher.** (Same as Speech Correction 428.) CE
- 481-4 Seminar.** C
- 501-4 Special Research Problem.** For majors and minors in the areas of special education. Choosing and conducting research activities. The student to select a topic for research and present it, upon completion, to the staff. Prerequisite: consent of staff. CE
- 513-4 Organization, Administration, and Supervision of Special Classes.** Emphasis upon the functions, underlying principles, and cautions to be observed in the organization and administration of special classes. The selection and training of teachers, problems of supervision, special equipment, transportation, co-operating agencies, and legal aspects of the program. Prerequisites: Guidance 305, Psychology 301 or 303. CE
- 570-2 Seminar: Vocational Guidance of the Handicapped.** Examination of vocational problems of the handicapped. Vocations open to handicapped; requisites for success. Advanced majors only. C
- 571-2, 572-2 Special Problems of the Handicapped I, II.** Program development and training of handicapped individuals with special emphasis on the socio-psychological aspects of disability. C
- 573-3 to 4 Psychodiagnostics for Special Populations.** (Same as Psychology 546.) C
- 574-1 to 12 Supervised Experience in Rehabilitation.** Provides for experience both on and off campus in counseling, interviewing, case study, and placement of rehabilitation clients under adequate supervision. C
- 577-4 to 12. Practicum in Special Education.** Practical experience in working with atypical children. A minimum of 8 to 12 hours per week in the classroom with atypical children who exemplify this area of specialization. Special research project. CE
- 580-8 (4,4) Seminar: Exceptional Children.** An intensive investigation of theoretical and research problems of exceptional children for advanced graduate students only. E
- 590-12 (4,4,4) Seminar: Mental Retardation.** An intensive investigation of theoretical and research problems of mental retardation for advanced graduate students only. E
- 596-5 to 9 Independent Investigation.** A field study required of each student working for the sixth-year professional certificate. The work should be done in the setting of a school system where the student is employed or where full co-operation is extended. The study will involve selecting of the problem, survey of pertinent literature, recording of results, and appropriate interpretations and summarizations. C
- 599-2 to 9 Thesis.** Minimum of 5 hours to be counted toward a master's degree. C

SPEECH

- General Speech:** 408-4, 429-4, 440-4, 449-4, 450-12 (4,4,4), 520-3, 530-1 to 4, 532-4, 599-2 to 9, 600-3 to 48.
- Oral Interpretation of Poetry:** 423-4, 424-4, 434-4, 523-3, 530-1 to 4, 599-2 to 9.
- Rhetoric and Public Address:** 407-8 (4,4), 417-4, 418-4, 425-3, 500-4, 504-3, 505-4, 508-4, 510-4, 524-3, 530-1 to 4, 599-2 to 9.
- Speech Education:** 402-4, 410-4, 427-4, 511-3, 525-4, 530-1 to 4, 599-2 to 9.
- 406-4 Teaching Speech in Secondary Schools.** Philosophy of speech education, and effective teaching of speech through curricular and extra-curricular work. Prerequisite: 16 hours of speech. CE
- 407-8 (4,4) History of American Public Address.** Critical studies of American speakers; selected speakers and speeches which reflect the dominant social and political ideas in American history. A lecture, reading, and discussion course. Parts may be taken independently. CE

- 408-4 Psychology of Speech.** Nature and development of speech, its basic psychology, and the part speech plays in personality development. CE
- 417-4 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. C
- 418-4 British Public Address.** Critical study of British speakers to c. 1920. Selection of material will be governed both by men and the issues that moved men throughout British history. C
- 423-4 Oral Interpretation of Poetry.** The reading of poetry and the interpretation of the thought and emotional content of the poetry to the audience. Prerequisites: 103, 223. C
- 424-4 Oral Interpretation of Dramatic Literature.** Reading, selecting, cutting, and presenting various types of dramatic literature. Each student gives a final recital program of readings. Prerequisites: 103, 223. C
- 425-3 Techniques of Discussion Leadership.** Studies in the field of group discussion designed to clarify the functions and concepts of the leader in democratic society. C
- 427-4 Secondary School Forensic Program.** Coaching and organizational methods for extracurricular and curricular forensic programs in school and college. C
- 429-4 Experimental Studies in Oral Communication.** A survey, analysis, and criticism of experimental approaches to the study of oral communication, with practice in planning and conducting experimental studies. C
- 434-4 Lecture and Lecture-Recital.** Study of professional work on the public platform which is climaxed by a lecture or recital of a professional nature. Prerequisite: 12 hours of public speaking, interpretation, or theater. C
- 440-4 Advanced Phonetics.** Phonetic theory. Materials and methods of linguistic geography. Prerequisite: 200. C
- 441-4 Teaching Speech in Elementary Schools.** C
- 449-4 General Semantics.** Means of changing implications so that language, in spoken or written form, describes the life facts. CE
- 450-12 (4,4,4) Laboratory in Interpersonal Communication.** Communication viewed as a process of relating and evaluating. Applications of general semantics and related philosophy, methodology and research to the functioning of the class itself through various speech activities. The course encompasses the common core of communication behaviors relevant to the chief communication specialties. C
- 500-4 Survey of Classical Rhetoric.** Ancient rhetoricians and orators from Corax to Augustine, with special emphasis upon the works of Aristotle and Cicero. Lectures and special studies. C
- 504-3 Medieval Rhetorical Theory.** An examination of the trends in rhetorical theory between A.D. 100 and 1600 designed to facilitate understanding of the transition from classical to modern theory. C
- 505-4 Modern Rhetorical Theory.** An analysis of selected theories of public address from the seventeenth century to the present, with a view of discovering the methods and objectives of modern rhetoricians and relating them to society and its problems during the period. C
- 508-4 Seminar: Studies in Discussion.** Studies in group thinking and group action with a view to improving discussion and conference techniques. C
- 510-4 Seminar: Persuasion and Social Control.** Studies covering the uses and applications of persuasion in the various fields of social activity. The mass media will be examined as they apply to such areas as politics, business, religion, and education. C
- 511-3 Teaching the College Speech Course.** Problems, methods, and materials in the teaching of speech in college with primary emphasis on the basic course. Examination of textbooks, courses of study, curriculum making, measurement, and relationship to other fields. C
- 520-3 Philosophical Foundations of Speech.** A special course reviewing the philosophy of speech for graduate and advanced students. Designed to take advantage of the knowledge and background of distinguished visiting professors. C
- 523-3 Seminar: Problems in Interpretation.** An investigation of the more advanced

problems in oral interpretation, such as creation of atmosphere, use of restraint, impersonation, and impressionism. Prerequisites: 18 hours in interpretation and theater and consent of instructor. C

524-3 Problems in Rhetoric and Public Address. Individual problems in the theories and methods in various fields of public speaking; a survey of the areas and methods of graduate research in public speaking. Prerequisite: 12 hours of public address. C

525-4 Seminar: Speech Education. Problems of philosophy and methods of teaching speech in the elementary and secondary schools. Prerequisite: 306 or consent of instructor. C

530-1 to 4 Research Problems. Individual work upon selected problems for research. C

532-4 Areas and Techniques of Research in Speech. Study and analysis of outstanding works in the various areas of research. Lectures on research techniques and study possibilities in the field. C

599-2 to 9 Thesis. Minimum of 5 hours to be counted toward a master's degree. C

600-1 to 48 Dissertation. Minimum of 36 hours to be earned for the Ph.D. degree. C

SPEECH CORRECTION

400-1 to 4 Independent Study in Speech Correction and Audiology. Activities involved shall be investigative, creative, or clinical in character. Must be arranged in advance with instructor. May be repeated up to six hours of credit. C

405-12 (4,4,4) Practicum in Speech and Hearing Therapy. Clinical and school procedures in speech correction and audiology. One hour of class per week, and two hours of clinical activity or work on clinically related projects for each hour of credit. Prerequisite: Junior Standing in Department. 405A (fall) emphasizes therapeutic procedures. 405B (winter) emphasizes diagnostic techniques. 405C (spring, summer) emphasizes the utilization of forms and the preparation of reports. Students may have up to twelve hours total credit in this course. Need not be taken in sequence, but A, B, or C cannot be repeated. C

406-4 Techniques and Interpretation of Hearing Tests. Principles and techniques of testing the hearing and interpreting those tests in terms of the individual's needs. C

409-4 Research Techniques in Speech Science. A presentation of the research techniques used in speech science with particular emphasis on equipment, experimental design, and study of significant research contributions to the field. Open to advanced students in speech or those with consent of the instructor. C

412-4 Cerebral Palsy. An investigation of the etiology, problems, and therapy of cerebral palsy. Prerequisite: 212 or consent of instructor. C

414-4 Anatomy and Physiology of Speech and Hearing Mechanisms. (See Physiology 414.) C

415-4 Aphasia. An investigation of the etiology, problems, and therapy of aphasia. Prerequisite: 412 or consent of instructor. C

416-4 Hearing. Designed to acquaint the student with the theories and facts concerned with the functions of the hearing mechanism. Prerequisite: 406 or consent of instructor. C

419-4 Communication Problems of the Deaf and Hard of Hearing. (Same as Special Education 419.) Objectives and techniques for the teaching of lip reading, speech conservation, and auditory training. Prerequisite: 406 or consent of instructor. C

420-4 Advanced Clinical Audiometry. Principles and procedures for advanced audiometric testing. Prerequisite: 406 or consent of instructor. C

428-4 Speech Correction for the Classroom Teacher. (Same as Special Education 428.) Etiology and therapy of common speech defects. Open to in-service teachers, seniors, and graduate students in education. CE

515-1 to 4 Readings in Speech Pathology. Supervised and directed readings in specific areas of speech pathology. C

516-1 to 4 Seminar in Residual Hearing. Special problems of auditory training, speech reading, hearing aids, and programming for aural rehabilitation. C

- 520-1 to 4 Seminar in Hearing.** Special hearing problems of interest to the advanced student. Special projects and field work. C
- 521-1 to 4 Seminar in Articulation and Delayed Speech.** Special problems of language development and articulation. C
- 522-16 (4,4,4,4) Seminar in Organic Speech Problems.** Prerequisites: Graduate standing in Department: (a) Developmental anatomy and physiology. (b) Teratology, Surgery, and Dentistry. (c) Neuropathological bases. (d) Clinical Management. Must be taken in a,b,c,d sequence or by consent of instructor. C
- 529-12 (4,4,4) Seminar in Stuttering Behavior.** (a) emphasizes theoretical analysis, (b) emphasis on diagnostic techniques, (c) application of principles to therapy. Must be taken in a,b,c sequence or by consent of the instructor. C
- 530-1 to 4 Research Problems in Speech Correction.** Individual work upon selected problems for research. C
- 531-1 to 4 Seminar in Experimental Phonetics.** An investigation into the experimental approaches for the study of the phenomena of speech. C
- 533-1 to 4 Seminar in Speech Science.** Special problems in voice science, and acoustic perception. C
- 534-1 to 4. Seminar in Instrumentation.** Familiarity with instruments, their uses, capabilities, and limitations, as they apply to the study of speech and hearing. C
- 536-1 to 4. Seminar in Administration of Speech and Hearing Programs.** A study of program settings, organizational procedures, and professional interrelationships in adult speech and hearing therapy. Field trips to rehabilitation centers and related agencies. C
- 599-2 to 9 Thesis.** C
- 600-1 to 48 Dissertation.** C

TECHNOLOGY

- 421-2 to 8 Practicum in Technology.** Experiences in the industrial applications of technological knowledge. Cooperative arrangements with selected corporations and professional organizations provide opportunity to study technical problems in the industrial environment under the direction of specialists. Prerequisite: 12 hours in technical subjects. C
- 430-2 to 8 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. C
- 570-2 to 6 Special Investigations.** For students who wish to make a thorough study or investigation of a specific problem in technological education. C
- 580-3 to 9 Seminar.** Collective and individual study of selected issues and problems relating to the various areas of technological education. C
- 599-1 to 9 Thesis.** C

THEATER

- 402-8 (4,4) Play Directing (C); 402-4 Directing (E).** (a) The principles and procedures of play direction including play selection, interpretation, and the patterning of auditory and visual stimuli. (b) Continuation of 402a emphasizing rehearsal procedures, control of tempo and mood, styles of presentation and performance, and other techniques in the direction of plays. CE
- 403-4 Aesthetics of the Drama and the Theater.** Principles and practice of modern dramatic production in the light of modern aesthetic theory. A course attempting to formulate an aesthetic judgment of the theater. C
- 404-4 Theater Management.** Theater operational procedure, including both fundamental structuring and house management. The former aspect includes administration, purchasing, and accounting practices, ticket sales, publicity, promotion, and public relations. The latter covers the management of box-office and ushering. C
- 405-8 (4,4) The Scenic Imagination.** (a) A study of the purely creative side of stage production. It includes an analysis of the script and its meaning for an audience;

a poetic evaluation of the setting, costumes, and lighting; and the blocking out of the stage action. (b) Theater research and documentation; an approach to sketches and models; a review of the historic forms of staging, with emphasis on the modern styles from naturalism to epic theater. C

406-1 American Professional Theater Procedures and Practices. An introduction to the everyday realities of a professional stage career, including problems of survival, professional ethics and protocol, personal relations, and the function of stage unions. C

409-4 High School Theater and Its Production Problems. C

411-4 Playwriting. The writing of a full-length play, a children's play, or a historical pageant-drama forms the basis of the course. Students may elect to write two one-act plays. Individual conferences supplement the class discussion and analysis of student writing. Prerequisite for graduate students: consent of instructor. C

412-4 Stage Design. The design of settings for the stage and other dramatic media. Prerequisite: 207. C

414-4 Costume Design. C

415-4 Advanced Costume Design. C

432-4 Stage Lighting. Instruments and control equipment; principles and techniques of lighting dramatic productions. C

438-4 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. C

439-4 Contemporary Theatrical Theory and Practice. The development of modern theatrical production; study of recent ideas in theater architecture, staging, and performance. Consideration of the film and television as dramatic media. Prerequisite: 121a or 121b or consent of instructor. E

502-4 Advanced Directing. Study of and practice in the techniques of directing period plays, verse plays, music dramas, arena productions and other types and styles of plays presenting special directing problems. C

503-4 Advanced Technical Problems. Solutions for problems presented by certain types of plays and modes of production. Study of drawing problems in the planning of floor plans, pictorial views, working drawings, and elevations. C

504-4 The Comic Theater. A study of comedic theory as applied to major types of dramatic composition. Dramatic theories of comedy from Aristotle to Freud are explored. Individual reports. C

505-4 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. C

506-4 The American Theater. The study of the development of the drama and the theater in the United States from colonial times to the present. Prerequisite: 313 or its equivalent. C

509-4 The High School Theater and its Production Problems. Consideration of stages, machinery, equipment, light controls and instruments, production techniques, and analysis of basic needs of high school theater. C

518-4 Theater Audience. A course attempting to determine (1) the relations between the drama, *mise-en-scène*, and theater audience; and (2) the psychological nature of the spectator's experience in the theater. C

519-1 to 12 Theater Practicum. Practical experience in acting, directing, and associated work on campus, on area tours, and in summer stock. C

526-3 Seminar in Theater Arts. Special problems of interest to the advanced student. C

530-1 to 4 Research Problems in Theater. Individual work upon selected problems for research. C

599-1 to 9 Thesis. Minimum of 5 hours to be counted toward a master's degree. C

ZOOLOGY

400-2 (C); 400-3 (E) Animal Taxonomy. The concepts of taxonomy and their use in zoology. Prerequisite: one year of biology or consent of instructor. CE

- 401-5 Genetics.** Principles of inheritance, including genetic mechanisms, mutation, and selection. Prerequisite: 15 quarter hours of biological science and consent of instructor. CE
- 402-4 Natural History of Invertebrate Animals.** Observation, identification, and life histories. Designed for teachers. Not for students specializing in invertebrate zoology. Prerequisite: one year of zoology including 102. CE
- 403-4 Natural History of Vertebrate Animals.** Observation, identification, and life histories. Designed for teachers. Not for students specializing in vertebrate zoology. Prerequisite: one year of zoology including 103. CE
- 404-4 to 8 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. Arrangements made spring quarter. Cost per individual will be approximately \$25 per week. (Only 4 hours may be used for credit.) Prerequisite: consent of department. CE
- 406-4 Protozoology.** Taxonomy, cytology, reproduction, and physiology of unicellular animals. Laboratory methods of culturing and studying. Prerequisite: one year of zoology including 102 or consent of instructor. CE
- 407-5 Parasitology.** Principles, collection, identification, morphology, life histories, and control measures. Prerequisite: one year of zoology including 102. CE
- 408-4 Herpetology.** Taxonomic groups, identification, and natural history of amphibians and reptiles. Prerequisite: one year of zoology. CE
- 409-5 Histology of Organs.** Microscopic structure of organs and tissues with emphasis on mammalian forms. Prerequisite: 202. C
- 410-4 Vertebrate Paleontology.** History of vertebrate animals in terms of their morphological change, geological succession, and ecological relationships. Prerequisite: one year of zoology including 202 or Geology 301. C
- 412-4 Advanced Entomology.** Morphology, physiology, systematics, and distribution of insects. Prerequisite: one basic course in entomology. CE
- 413-5 The Invertebrates.** Structure, development, and natural history of invertebrates, except insects and parasites. Prerequisites: one year of zoology, including 102. C
- 414-4 Fresh-Water Invertebrates.** Taxonomic groups, identification, and natural history of the regional fauna. Prerequisites: one year of zoology, including 102. C
- 441-4 Developmental Biology.** Principles of development in organization. Prerequisite: 300 and one course in cellular physiology, or consent of instructor. C
- 459-4 Game Birds.** Natural history and management. Prerequisite: one year of zoology including 103. C
- 461-4 Mammalogy.** Taxonomic groups, identification, and natural history of mammals. Prerequisite: one year of zoology including 103. CE
- 463-4 Game Management.** General survey of management techniques. Prerequisites: one year of biological science, consent of instructor. C
- 465-4 Ichthyology.** Taxonomic groups, identification, and natural history of fishes. Prerequisite: one year of zoology including 103. C
- 466-4 Fish Management.** Sampling, dynamics, and manipulation of fish populations, age and growth of fishes, and habitat improvement. Prerequisites: one year of biological science, consent of instructor. C
- 480-3 Zoogeography.** Concepts and principles relating to patterns of animal distribution on a continental and world-wide basis. Prerequisite: 103 or consent of instructor. E
- 501-4 Animal Biology For High School Teachers of Biology.** Designed to add new interpretations and evaluations to the in-service teacher's previous training in animal biology. Principles illustrated by laboratory and field work will be re-emphasized in the context of modern concepts of biology. Prerequisite: one year of biology. C
- 502-2 Recent Developments in Biological Sciences.** A series of lectures based upon recent research, designed to acquaint the in-service teacher with advances and changes in concepts. Prerequisite: one year of biological science. C
- 507-8 BSCS—High School Biology.** C
- 508-4 Helminthology.** Identification, structure, physiology, and life history of parasitic worms. Prerequisite: consent of instructor. C

- 510-4 Bio-ecology.** Composition and development of biotic communities, and the relationships of plants and animals to their environment. Cost of field trips may be \$10-\$25 per student. Prerequisite: consent of instructor.
- 511-4 Limnology.** Principles exemplified by the lakes and streams of Southern Illinois. Cost of field trips may be \$10-\$25 per student. Prerequisite: consent of instructor.
- 512-3 Animal Geography.** Principles of the distribution of the animals of the world. Prerequisite: consent of instructor.
- 513-3 Advanced Ornithology.** Taxonomic groups, structure, and behavior of birds. Prerequisite: consent of instructor.
- 520-5 Advanced Invertebrate Zoology.** The nature and life of invertebrate animals with emphasis on comparative form, function, behavior, and occurrence.
- 521-4 Advanced Limnology.**
- 525-5 Cytology.** (Same as Botany 525.) Microscopic study of protoplasm, including mitosis and meiosis; discussions of cytological behavior. Prerequisite: consent of instructor.
- 540-3 Factors in Animal Reproduction.** Genetic and physiological factors in determination, differentiation, and modification of sex in animals. Prerequisite: consent of instructor.
- 560-3 Advanced Game Management.** Principles of maintenance and improvement of game resources. Prerequisite: consent of instructor.
- 561-4 Game Mammals.** Natural history and management. Prerequisite: consent of instructor.
- 566-4 Fish Culture.** Production of game, food, and bait fishes. Design of facilities chemical and biological variables, spawning techniques, diseases and nutrition. Prerequisite: consent of instructor.
- 578-4 Population Genetics.** Genetic structure of populations, factors causing changes and principles governing rate and direction of change. Prerequisite: consent of instructor.
- 579-4 Animal Behavior.** The biological basis for the actions and responses of animals. Prerequisite: consent of instructor.
- 580-4 Advanced Systematics.** The implication of systematics, including the theory and dynamics of classification, speciation, population genetics, and evolution. Prerequisite: consent of instructor.
- 581-3 Readings in Current Zoological Literature.** Prerequisite: graduate status in biological science.
- 582-1.5 (.5,.5,.5) Graduate Zoology Seminar.** Credit may not be used by majors in zoology.
- 583-3 (1,1,1) The Teaching of Zoology in College.** Methods, practices, and objectives in teaching zoology. Designed as part of the apprenticeship program for preparation of college teachers. Prerequisite: graduate status in a biological science.
- 584-3 (1,1,1) Protozoology Seminar.** Advanced discussions of trends and problems in protozoology. Prerequisite: 406 or consent of instructor.
- 596-2 to 12 Special Research.** Investigations in zoology other than those for the degree. Only 3 hours may be credited toward a degree. Prerequisite: consent of instructor.
- 599-2 to 9 Research and Thesis.** For master's degree.
- 600-3 to 48 Research and Dissertation.** For doctor's degree.



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