

1969

## 1969-1970 Southern Illinois University Bulletin Edwardsville Campus (Graduate School Catalog)

Southern Illinois University Carbondale

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Southern Illinois University

*Bulletin*

*1969/1970 Graduate School Catalog  
Edwardsville Campus*

SIU

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.*

# Southern Illinois University *Bulletin*

*1969/1970 Graduate School Catalog  
Edwardsville Campus*



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## This Issue . . . . .

of the *Southern Illinois University Bulletin* covers in detail questions concerning the Graduate School and applies to the Edwardsville Campus. It supersedes Volume 9, Number 5.

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Division of Technical and Adult Education.  
Graduate School Catalog (Carbondale or Edwardsville).  
Guidelines for Prospective Students (Carbondale or Edwardsville).  
Schedule of Classes. Please specify *quarter* (fall, winter, spring, or summer) and *campus* (Carbondale or Edwardsville).  
Student Work and Financial Assistance.  
Undergraduate Catalog. The catalog is available 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. A copy of either edition (Carbondale or Edwardsville) of 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

*SPRING, 1969* Quarter Begins Wednesday, March 26 \*  
Memorial Day Holiday Friday, May 30  
Final Examinations Wednesday–Tuesday, June 4–10  
Commencement (Edwardsville) Tuesday, June 10  
Commencement (Carbondale) Wednesday, June 11

*SUMMER, 1969* Quarter Begins Tuesday, June 17 \*  
Independence Day Holiday Friday, July 4  
Final Examinations Monday–Friday, August 25–29  
Commencement (Edwardsville) Friday, August 29  
Commencement (Carbondale) Saturday, August 30

*FALL, 1969* New Student Week Sunday–Tuesday,  
September 21–23  
Quarter Begins Wednesday, September 24 \*  
Thanksgiving Vacation Tuesday, 10 P.M.–  
Monday, 8 A.M., November 25–December 1  
Final Examinations Monday–Saturday,  
December 15–20

*WINTER, 1970* Quarter Begins Monday, January 5 \*  
Final Examinations Monday–Saturday,  
March 16–21

*SPRING, 1970* Quarter Begins Monday, March 30 \*  
Memorial Day Holiday Friday, May 29  
Final Examinations Monday–Saturday, June 8–13  
Commencement (Carbondale) Friday, June 12  
Commencement (Edwardsville) Saturday, June 13

\* Classes begin with the evening classes after 5:30 P.M. on the Carbondale Campus and with the evening classes after 4:30 P.M. on the Edwardsville Campus.



# Board of Trustees and Officers of Administration

## BOARD OF TRUSTEES

*Term expires*

Kenneth L. Davis, <i>Chairman</i> , Harrisburg	1969
Lindell W. Sturgis, <i>Vice-Chairman</i> , Metropolis	1971
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Martin Van Brown, Carbondale	1973
Ivan A. Elliott, Jr., Carmi	1973
Harold R. Fischer, Granite City	1969
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# 1 / The Graduate School

## **The Role of the Graduate School**

The Graduate School is the central agency for organizing and supervising all graduate work of the University and for facilitating the research of the University. It plays an essential role in the development of instructional and research programs, in the acquisition of funds, and in the procurement of facilities necessary to encourage and support the research of the members of its scholarly community. In addition, the Graduate School is a major contributor to the public services provided by the University to the region, the state, the nation, and a number of other countries. In all of its programs of instruction and research, the Graduate School sets a high standard of achievement. It is in those students who have demonstrated this quality of excellence by completing advanced courses of study and by achieving significant results in their research that the Graduate School makes its major contribution to the public welfare.

## **Lovejoy Library**

The Elijah P. Lovejoy Library contains about 310,000 volumes, 150,000 government document items, 50,000 maps, 8,000 phonograph records, and a number of special research collections. About 50,000 volumes are added annually and 3,500 periodicals are subscribed to. The Alton and East St. Louis Libraries also contain about 15,000 volumes each, mostly chosen to support the General Studies programs at those locations. In addition, the resources of the Morris Library at Carbondale, approaching a million volumes, are available to faculty and graduate students. A printed catalog and other aids are available for the identification of materials which may be borrowed. Similarly accessible are the 2,000,000 volumes of the Center for Research Libraries, Chicago. Special memberships also permit faculty and graduate students to use the St. Louis Mercantile Library and the Missouri Historical Society Library.

Some of the areas of particular strength are:

1. A comprehensive collection of all English language trade publications, excluding some highly specialized fields, from most major countries.
2. A documents collection of about 150,000 items, including most of those published by the United States Government, the State of Illinois, the United Nations, and many other state, national, and international agencies.
3. A map collection consisting of about 50,000 maps, chiefly those of the Army Map Service and the United States Topographical Survey.
4. A considerable collection of curriculum guides, children's books, current school texts and other specialized materials in education.
5. Files of Negro newspapers on microfilm.

6. A collection of documents on more than eighty reels of microfilm on the history of the Mormons in Illinois.

7. Over 20,000 items of sheet music and scores of American popular music.

8. Over 8,000 phonograph records, including a large number of spoken word records and lectures.

9. A Slavic and East European collection of about 4,000 volumes which includes a large number of rare Czech-American imprints.

10. Several thousand books, pamphlets, newspaper issues and periodicals, many of them in German, on the history of Naziism and related movements in the United States.

11. A collection of about 3,000 anti-slavery pamphlets on microcards, which is part of the Library's larger collection devoted to abolitionist literature and to both historical and contemporary civil rights literature.

The Lovejoy Library is also a major source of materials on the history of the region which the Edwardsville Campus serves.

Lists of current periodicals and other serials are available. Further information on the collections of Lovejoy and Morris Libraries may be obtained in the December, 1968, issue of the Missouri Library Association *Quarterly*.

### **Research**

Research is the special concern of the Graduate School because its faculty must engage in scholarly research activities to maintain its effectiveness and also because advanced instruction of graduate students consists mainly of guidance in research. For these reasons, University policies governing research are developed by the Graduate School and administered through it.

The Office of Research and Projects has been established in the Graduate School to assist in the continuing development of the research activities of the University. University support for individual research projects is available to faculty members through the special research projects program administered by this office. The Office of Research and Projects also supervises cooperative research projects and particularly assists applicants in the preparation and submission of research proposals that involve outside support from such sources as government, foundations, business, and industry.

### **Data Processing and Computing Center**

The Data Processing and Computing Center of Southern Illinois University is a centralized facility which was established in 1962 to serve the research, instruction, administration, and area service computer needs of the University. The center is presently located in the basement of the Communications Building in rooms 0112 to 0124 and room 0185. A classroom for computer instruction is located in room 0186.

The center is equipped with an IBM 1620, 40 K, card and disk system devoted 100 percent to research and instruction and an IBM 1401, 8 K, 5 tape, 1 disk system that is used for instruction, administration reports, and some smaller research projects. An IBM 7044, 32 K word, 10 tape, 2 fixed disk system is available at the Carbondale Campus for the solution of larger problems. At noon of any day, the larger problems are placed in

the mail shuttle service, and the solution is returned the next day. The Carbondale center also has an MCR Docutran optical scanner for processing information directly from coded sheets.

The facilities are available for laboratory and demonstration purposes, for credit and non-credit instruction in all departments, for faculty and graduate university-sponsored research, for faculty and graduate externally sponsored research, for faculty and graduate independent research and for contract work after assignment of a project number.

There is no charge for the use of the center's facilities in connection with independent and university-sponsored research projects for faculty or graduate students which are not supported or are supported by funds that are limited to the regular state budget appropriations. The center charges for utilization in connection with an externally sponsored research project supported by contract with a government agency, a foundation, an industry, or business and covered by an itemized budget. Persons negotiating such contracts shall be expected to anticipate the need for center usage and to cover the cost of such services in the contracts.

An informal non-credit short course is offered each quarter for faculty and graduate students to introduce the FORTRAN computer language, the library of computer programs, and the open shop policy. For problem solutions not in the present library of programs on the computer, the faculty may program the problem or rely on the staff resources of the center. The graduate student should expect to utilize the staff resources only for brief consultation under the present open shop policy.

### **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 a basis of scholarship. Recipients are permitted to carry normal graduate schedules. The stipend for the academic year is normally \$2115 to \$2250, plus remission of tuition but not other fees. There is no work requirement. Fellowships are ordinarily renewable for the summer quarter following the period of appointment. Students seeking a master's degree may hold a fellowship for no more than four quarters. Fellowships for the summer depend upon recommendation by the student's major department. All application materials should be submitted 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 chairman.

Teaching, research, and other assistantships are available in a number of departments and research agencies. These positions pay a stipend which ranges from \$200 to \$325 per month, with the exact amount depending upon the assignment, experience, and academic achievement of the student. Remission of tuition is granted, but fees must be paid. Service of twenty hours per week, or corresponding load in teaching, is required. Assistants must carry no more than 12 hours and no less than 6 hours of credit per quarter. Students holding assistantships through the academic year will ordinarily be eligible for remission of tuition when enrolled for the following summer quarter whether or not they hold an assistantship for that quarter. Inquiries should be addressed to the appropriate chairman before February 1 preceding the academic year for which the assignment is sought.

### Housing

Graduate students may use the listings of accepted facilities maintained in the Housing Office, or they may seek housing on their own. 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.

The University has under construction at the present time 248 apartment units consisting of two- and three-bedroom furnished and unfurnished apartments. To secure further information concerning the procedures for making application and the qualifications to live in University housing, contact should be made with the Housing Office, Southern Illinois University, Edwardsville, Illinois 62025.

### Admission to the Graduate School

A student should obtain application forms from the Graduate School and submit application, together with transcripts and other supporting material, directly to the Graduate Admissions Office where it is evaluated for compliance with Graduate School admission requirements. Only if these are met and if the student seeks a degree is the application forwarded to the faculty in which the student indicates his desired major. The admission requirements of the Graduate School and the faculty must both be met before the student is admitted either conditionally or unconditionally, and both the Graduate School and the faculty may specify conditions. Several faculties require additional materials such as test scores or letters of recommendation. The student is informed of his admission status after this process has been completed. Admission to the Graduate School is determined almost entirely by the caliber of the applicant's previous college work.

To permit sufficient time for application to be processed, these deadlines for receipt of applications and official transcripts have been set:

1. *The second Saturday in July for admission to the fall quarter.*
2. *The last Saturday in October for the winter quarter.*
3. *The last Saturday in January for the spring quarter.*
4. *The last Saturday in March for the summer quarter.*

Applications which are incomplete on the deadline date or are received later may be granted unclassified (non-degree) admission status for the quarter for which admission was originally sought. The application papers continue to be processed for admission to a degree program only for the quarter following the one originally applied for. If the student decides to enter as an unclassified student, this in no way influences the decision relative to his acceptance as a degree candidate. Whether work taken by a student who is unclassified because of late application later counts toward a degree is decided by the Graduate School and the faculties 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. He must also submit a transcript showing the work he has completed and the courses he is taking.

An undergraduate student who is within 16 quarter hours of a bachelor's degree may take courses for graduate credit by applying for admis-

sion to the Graduate School in the usual way. At the time of registration, he must also obtain the approval of the graduate dean to take such courses for graduate credit. He remains an undergraduate student officially until he completes his baccalaureate requirements.

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

#### *Admission to Graduate Study for the Master's Degrees*

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

A student with a grade-point average of 3.40, but less than 3.70, may be granted *conditional admission* and will remain on conditional status until he earns 15 or more quarter hours of credit 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 of *C* or lower earned while on conditional status will be applied on a master's program. In addition, the conditionally admitted student must satisfy the Graduate English requirement before completing more than 24 quarter hours. Failure to meet these conditions will result in a student's being dropped from the degree program. A department, faculty, or other degree-program unit may add its own conditions for admission regardless of the grade-point average.

A student with an undergraduate grade-point average below 3.40 may be admitted only as an unclassified student.

#### *Admission to Graduate Study for the Specialist's Certificate*

An applicant for admission to graduate study beyond a master's degree may be admitted either conditionally or unconditionally. Conditions may be prescribed by both the Graduate School and the faculty of the program in which an applicant wishes to pursue his course of study. A student should first submit his application, together with transcripts and other supporting materials, to the Graduate Admissions Office where it is evaluated for compliance with admission requirements of the Graduate School. If these are met, the Graduate School forwards the credentials to the academic unit offering the major he indicates on his application, for action on admission to its degree program.

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 graduate grade-point average of 4.25 on a five-point grading scale is required. A master's degree from an accredited institution is regarded as the basic academic requirement for one wishing to pursue the sixth-year program.

The Dean of the Graduate School informs each student of any conditions imposed by the Graduate School or by the academic unit of his major. Among these conditions may be the successful completion of entrance examinations. All conditions must be fulfilled before the student can be admitted unconditionally. A student seeking admission to a master's or Sixth-Year Specialist's Certificate Program offered in the Education Division will ordinarily consult the adviser listed on page 8 for the faculty in which approval for a particular major is sought.

### *Admission to Graduate Study as an Unclassified Student*

A student may apply for admission to the University as an unclassified (non-degree seeking) student when he does not seek a graduate degree or certificate, when he has applied too late for the term for which he seeks admission, or when he wishes to qualify for admission to a degree program because his scholastic record does not qualify him for conditional admission. A student who seeks admission as an unclassified graduate student must present evidence that he holds a bachelor's degree.

*Qualifying work* has been established in order that students whose undergraduate grade-point averages are below the minimum required for admission to a master's program (3.4 on an  $A = 5.0$  scale) may prove themselves capable of better academic performance and thereby *qualify* for *consideration* for admission. Once a student has made formal application for admission to the Graduate School and has officially been informed that his grade-point average is below the minimum requirement, he may then apply for admission as an unclassified graduate student to pursue qualifying work.

A student whose average is between 3.2 and 3.399 may qualify for consideration by earning a 4.0 or better in not less than 12, nor more than 24, quarter hours of 300- or 400-level courses and by passing the Graduate English requirement. If he earns a 4.0 in the first 12 quarter hours, that is all he is required to take. If he does not earn a 4.0 in the first 12 quarter hours, he may continue until he has a total of 24 quarter hours, in an attempt to raise the grade-point average to 4.0.

A student whose average is between 3.0 and 3.199 may qualify for consideration by earning a 4.0 or better in 24 quarter hours of 300- or 400-level courses and by satisfactory completion of the Graduate English requirement.

No applicant with an undergraduate grade-point average below 3.40 may take more than 24 quarter hours in seeking to qualify for admission, and no more than one-half of the work should be taken in a single subject area.

Successful completion of this work does *not* assure the student of admission, but only of consideration by the department of his choice. It is solely the department's decision to accept the student into their master's program. Therefore, it is strongly suggested that the student seek the advice of the graduate adviser in the department before and while he is doing qualifying work.

### *Admission of International Students*

A student from abroad is subject to all requirements for admission established by the Graduate School. In addition, he must complete special forms pertaining to the admission of international students. For these admission forms and for other information concerning international students, inquiries should be sent to the Director of Foreign Admissions, Registrar's Office, Southern Illinois University, Edwardsville, Illinois 62025.

International students whose native tongue is not English are required to demonstrate proficiency in the English language through the following procedures.

1. A minimum score of 450 on the Test of English as a Foreign Language (TOEFL) is required for consideration for admission. Information

on this test and on the dates and places of testing may be obtained from the Educational Testing Service, Box 899, Princeton, New Jersey.

2. Students with a TOEFL score of 550 or more are admitted unconditionally to the Graduate School, if other academic requirements have been met.

3. Students with a TOEFL score between 450 and 549 are admitted to the Graduate School conditionally, if other academic requirements have been met, pending the results of tests which are taken upon the students' arrival at Southern Illinois University.

4. Students who fail the locally-administered examinations are required to take and pass intensive English proficiency work here, or its equivalent at some other institution, before they are admitted unconditionally to degree programs at Southern Illinois University or are allowed to take academic work counting towards a degree at Southern Illinois University.

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

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

If the above requirements are satisfactorily met and the student is admitted to a degree program, he is required to certify to the University that he has adequate financial resources available to him to undertake and continue in a program of study.

### **Advisement**

Each student admitted to the Graduate School is expected to consult a graduate adviser in the faculty of his major for assistance in planning his total program and in choosing courses each quarter. As soon as the student gains approval for a thesis topic and a thesis director, the latter is designated as chairman of the advisory committee. This committee advises the student in the preparation of the thesis, evaluates its quality when completed, and supervises the final examination, written or oral, when one is required.

Maximum course work for graduate students is 18 hours each quarter; 12 hours is considered a normal load. The maximum for teaching assistants, graduate interns, and research assistants, who are employed half-time, is 12 hours and the minimum is 6 hours; for persons who are employed full-time the maximum is 8 hours; for persons attending the eight-week summer session, the maximum is 12 hours. 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. Program changes after registration must be approved by the student's adviser and the Dean of the Graduate School. They may involve payment of a program change fee. Program change forms 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.



*Graduate Advisers*

Following is the list of advisers to graduate students pursuing a master's degree at Edwardsville.

Art—Harry H. Hilberry	Government—Daniel McHargue
Behavioral Science—Paul Campisi	Health Education *—Zadia Herrold
Biological Sciences—	History—Herbert Rosenthal
Ralph Axtell	Instructional Materials *—
Business Administration *—	Eldon Madison
I. A. Hardy	Mathematics—Robert N. Pendergrass
Business Education—Mary M. Brady	Music—Warren A. Joseph
Chemistry—William J. Probst	Philosophy *—George W. Linden
Counselor Education—John McBride	Physical Education *—Zadia Herrold
Economics *—Howard Dye	Physics—Lionel Walford
Education, General—Gordon C. Bliss	Psychology—Erwin Brinkmann
Educational Administration and	Secondary Education—
Supervision—George C. Ackerlund	Myllan Smyers
Elementary Education—	Sociology—Paul Campisi
Arthur Jordan	Special Education—Faye Shaffer
Engineering *—Julius Brown	Speech *—Hollis L. White
English—William C. Slattery	Speech Pathology and Audiology *—
Foreign Languages—	Hollis L. White
Alfred G. Pellegrino	Theater *—Andrew J. Kochman
Geography—Melvin Kazeck	

\* Course work only offered at this time.

**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:

	Not more than 5 hrs.	More than 5, less than 11	11 or more
Tuition Fee—Illinois Resident . . . . .	\$14.00	\$28.00	\$42.00
Tuition Fee—Out of State . . . . .	(30.00)	(115.00)	(172.00)
Student Welfare and Recreation			
Building Trust Fund Fee . . . . .	5.00	10.00	15.00
Student Activity Fee . . . . .	3.50	7.00	10.50
University Center Fee . . . . .	5.00	5.00	5.00
Athletic Fund Fee . . . . .	3.00	6.50	10.00
<i>Total</i> —Illinois Resident . . . . .	30.50	56.50	82.50
<i>Total</i> —Out of State Resident . . . . .	(46.50)	(143.50)	(212.50)

The student activity fee includes the fees for limited hospitalization, entertainment, partial athletics, the student newspaper and yearbook, and such other privileges as may be provided.

Teaching 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.

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.

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

### **Student Work and Financial Assistance**

The University maintains an Office of Student Work and Financial Assistance Program, which includes work on and off campus, cooperative work-study programs, summer employment, the federal work-study programs, and scholarships, awards, prizes, grants-in-aid, private agency awards, and student loan funds.

Additional information may be obtained from the Director of Student Work and Financial Assistance Program.

### **University Placement Services**

The University Placement Services assists students seeking employment after completion of their education. Its facilities are free to students, who are urged to register or up-date their papers during the fall quarter of each academic year. All inquiries concerning this service should be made to the Director of the University Placement Services.

### **Health Services**

The University maintains a health center which covers all types of medical services with a full-time physician on duty.

### **Graduate Degrees Offered**

Graduate degrees are available in the following fields:

#### *MASTER OF ARTS*

Behavioral Science  
Biological Sciences  
English  
Geographical Studies  
Government  
History  
Mathematical Sciences  
Psychology  
Sociology

#### *MASTER OF FINE ARTS*

Art

#### *MASTER OF MUSIC EDUCATION*

Music

#### *MASTER OF SCIENCE*

Behavioral Science  
Biological Sciences  
Chemistry  
Geographical Studies  
Mathematical Sciences

Physics  
Psychology

#### *MASTER OF SCIENCE IN EDUCATION*

Art Education  
Biological Sciences  
Business Education  
Chemistry  
Counselor Education  
Educational Administration and  
Supervision  
Educational Psychology  
Elementary Education  
English  
Foreign Languages  
Geography  
Government  
History  
Mathematics  
Physics  
Secondary Education  
Special Education

### Grading System

Grades are recorded by the letters *A*, *B*, *C*, *D*, and *E* ( $A=5.00$ ). Other grades may be:

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

*Wp*—Authorized withdrawal made after first four weeks through a program change with a passing grade. Work may not be completed.

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

*Inc*—Incomplete. Has permission of instructor to be completed within a time period designated by instructor, but not to exceed one year from the close of quarter in which course was taken. If *Inc* remains, it is not included in grade point computation. To complete the work, a student should not register for the course again but should complete the work from the original registration.

*Def*—Deferred. Used only for graduate courses of an individual, continuing nature such as thesis or research. When the work is completed, grade is changed to a letter grade.

*Abs*—Unauthorized withdrawal. Used when student fails to continue in attendance, but does not withdraw through a program change. Counted as an *E* in calculating grade-point average.

*S*—Satisfactory. Used only for noncredit courses.

*U*—Unsatisfactory. Used only for noncredit courses.

*Au*—Audit. A student registering for a course on an *audit* basis receives no letter grade and no credit hours. An auditor's registration card must be marked accordingly, and he pays the same fees as though he were registering for credit. A student registering for a course for *audit* may change to a credit status or vice versa through the official program change method during the first four weeks of a quarter. Thereafter the change may not be made.

Note: Letter grades *A*, *B*, *C*, *D*, and *E* as well as the grades *WE* and *Ab* are included in grade-point averages for academic retention. Authorized withdrawals made through a program change during the first four weeks of the term do not carry a grade. No credit is allowed toward a graduate degree for courses in which a grade below *C* is earned.

### Master's Degrees

#### GENERAL REQUIREMENTS

Forty-eight hours of acceptable graduate credit are required for a master's degree, except for the program in Fine Arts where 60 hours are necessary. 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. An evaluation of transfer credit is made in every case and may result in a reduction of the credit offered. Only in unusual circumstances is transfer credit given for work bearing a grade below *B*. No credit toward the degree may be earned by correspondence.

Only credit earned within a six-year period preceding the completion of requirements for the degree, whether at Southern Illinois University or elsewhere, is counted toward the degree.

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 chosen area of study; 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.

Each candidate for a master's degree shall write a thesis except where a graduate program has been approved by the Graduate Council to provide for some other arrangement. The thesis may be counted for not more than 9 nor less than 5 quarter hours of credit. For nonthesis programs, a research paper should show evidence of the student's knowledge of research techniques and should be based on a special project or specific courses as may be recommended by the advisory committee. 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. Two copies of the approved thesis (the original and first carbon) must be presented to the Graduate School at least five weeks prior to the date of graduation, to be bound and shelved in the library.

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

Each student whose native tongue is not English, and others having an undergraduate grade-point average below 3.70, must satisfy the graduate English requirement by passing the Graduate English Examination. The examination is offered once each quarter and should be taken the first quarter the student enrolls. After two failures, a period of six months must elapse before the student may take it again. After three failures, the student may not attempt the examination without permission from the Graduate Dean. The English requirement must be satisfied before the student has completed 24 quarter hours except the qualifying student who must pass it before being admitted to a degree program.

Candidates are expected to meet requirements in force during the year of graduation, but due consideration is 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. 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, the name of the chairman of the advisory committee, and the thesis adviser.

Whenever a student's grade-point average falls below 4.0, his standing is in jeopardy. When a student has accumulated 24 quarter hours of work after admission to a degree program, and has 8 or more quarter hours of *C* or *below* in 400- or 500-level courses, *not balanced* by *A* in 400- or 500-level courses, he will be dropped from the Graduate School and is not again admissible to a degree program.

The following deadlines are stated for the guidance of the candidate for the master's degree:

1. The Graduate English examination is to be taken by a conditionally admitted student 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 completed thesis accepted by the advisory committee should be presented to the Dean of the Graduate School at least five weeks before graduation.

5. The preliminary checkup and application for graduation are to be made with the Graduate School and the Registrar's Office at least five weeks prior to the graduation date. Application for graduation forms, which may be secured from the Registrar's Office, should be completed and returned to that 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 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 by the candidate.

#### 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 30 hours must be on the 500 level. A thesis is required.

#### MASTER OF MUSIC EDUCATION DEGREE

Forty-eight hours of acceptable graduate credit are required for the Master of Music Education degree candidate, of which a minimum of 24 hours must be on the 500 level. A thesis or a recital and a supporting paper is required.

#### 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 education 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 Education Division, and the Dean of University Graduate Studies and Research. The student should seek counsel regarding the completion of these requirements before his first enrollment for graduate work.

A thesis is not normally expected of students working towards this degree; instead, a research paper is required and the student is required to take Educational Administration 500 or a similar research course, as well as Counselor Education 420 or 422 in lieu of the thesis. There is no foreign language requirement for the Master of Science in Education degree.

## 2 / Instructional Units

THE MASTER OF ARTS and the Master of Science degrees, with work in behavioral science, biological sciences, chemistry, English, geography, government, history, mathematics, physics, psychology, and sociology are offered on the Edwardsville Campus. The Master of Fine Arts degree, the Master of Music Education degree, and the Master of Science in Education degree, the latter with programs in business education, counselor education, educational administration and supervision, elementary education, special education, and approved areas of secondary education may also be completed on the Edwardsville Campus.

### Art

Graduate programs in art lead to the Master of Fine Arts or Master of Science in Education degree. In addition to the general rules, regulations, and requirements of the Graduate School, the following specific requirements pertain to these degrees. The faculty should be consulted for complete details.

#### *Master of Fine Arts Degree*

The Master of Fine Arts degree is a professional degree intended to further the individual artistic development of each degree candidate, and is designed to provide him with professional competencies in one or more of the creative arts of sculpture, painting, printmaking, and ceramics, or in the specialized areas of art education.

*Prerequisites.* 9 hours of Art History; 50 hours of Studio courses; 12 hours of Art Education (For Art Education option only).

Approval by the Graduate Faculty of a portfolio of work in the areas of intended specialization. (This material should be submitted only when requested and may be either originals or good photographs.)

*Specializations.* A candidate for the Master of Fine Arts degree has the option of specializing in one of the four major studio areas of sculpture, painting, printmaking, or ceramics, or may combine a reduced studio emphasis with specialization in art education. The candidate must accumulate a minimum of 60 quarter hours of graduate credit, 30 hours of which must be at the 500 level. He must satisfy the following course requirements:

1. Studio majors only: A minimum of 20 hours in one major area and a minimum of 32 hours in studio courses.

2. Art Education option only: A minimum of 12 hours in one studio area and a minimum of 24 hours of studio courses.

3. Art Education option only: A minimum of 16 hours of art education.

4. All candidates: A minimum of 12 hours of graduate art history; a minimum of 3 hours of graduate drawing; a minimum of 5 hours of Thesis 599.

*Thesis.* The candidate specializing in a studio area presents a thesis in-

volving his major field. The thesis consists of a final studio project(s) accompanied by written and photographic records and explanations, in proper thesis form, and the presentation of a thesis exhibition of the candidate's works designed and hung by the candidate. For the art education specialization, the candidate presents a thesis which may be experimental, historical, or descriptive, but includes evidence of academic knowledge of the general area which he is investigating.

*Examinations.* Examinations for the Master of Fine Arts degree consist of both written and oral examinations and include a defense of the thesis. These examinations are scheduled and supervised by the candidate's major professor and where possible, the examining committee for oral examinations is comprised of the student's graduate committee. The candidate is given reasonable and proper notice of the dates of both written and oral examinations.

### *Master of Science in Education Degree*

This degree is given in cooperation with Secondary Education. The Faculty of Art and Design administers and provides the work in Art Education and Studio Areas. Applicants for this program should have an undergraduate degree in art or art education, and may be required to take additional undergraduate courses if needed as preparation for graduate offerings.

The requirements for this degree total a minimum of 48 quarter hours. These hours are distributed as follows: 16 hours in education; 32 hours in art education, art history, and studio; 5 to 9 hours to be devoted to either thesis work or research work. Such work results in the writing of a thesis or a research paper. The candidate must participate in an oral examination of the above-mentioned thesis or research paper.

### **Behavioral Science**

The program leading to the Master of Arts and the Master of Science degrees in Behavioral Science is offered by the combined Faculties of Anthropology, Psychology, and Sociology. A coordinating committee consisting of representatives of the respective departments has the responsibility for coordinating the program.

The program in Behavioral Science consists of 48 hours of course work in anthropology, psychology, and sociology excluding thesis credit. A core curriculum aimed at giving students a broad understanding of the three disciplines involved consists of the following courses:

- |   |         |
|---|---------|
| 1. Pro-Seminar in Cultural Anthropology | 8 hours |
| 2. Pro-Seminar in Psychology            | 8 hours |
| 3. Seminar in Sociological Theory       | 4 hours |
| 4. Seminar in Social Psychology         | 4 hours |

Exceptions to the core courses may be approved by a student's advisement committee (described below). The important aspect of this program is that it gives the student a broad appreciation of the three disciplines and indicates their interrelatedness. The core, other graduate level courses, and individual research are meant to be flexible to meet individual student needs. It should be noted parenthetically that the program does not include equivalent courses which other programs now offer for certification for teachers, counselors, or psychologists. The committee, in consultation with the student, determines the final program.

Students are routinely expected to meet all course prerequisites. For example, in the case of the Pro-Seminar in General Psychology, these include a previous course in Introductory Psychology, Statistics, and Experimental Psychology.

*Admission:* To enroll in this program a student must satisfy the admission requirements of the Graduate School for unconditional admission and must have been approved by the Graduate Dean and the Chairman of the Behavioral Sciences and Psychology Faculties respectively upon the recommendation of the interdisciplinary coordination committee responsible for the administration of the Behavioral Sciences Program. Students who show high promise but who do not meet the above admissions requirements are considered for conditional admission by the committee.

*Examination:* A student must demonstrate general knowledge of the three subject areas by satisfactory performance on a comprehensive written examination. The examination is taken only after completion of the 24 hours core program.

*Thesis:* He must complete a thesis, or in exceptional cases with the approval of the coordinating committee, present an acceptable research paper demonstrating basic research competence.

Interested students may write to or consult with the Chairman of the Behavioral Sciences Faculty or the Chairman of the Psychology Faculty for more detailed information.

### **Biological Sciences**

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

A student with a baccalaureate degree who satisfies the general admission requirements may apply for admission to the biological sciences program. The entering graduate student should have completed basic background preparation in the biological sciences, plus organic chemistry, one year of physics, and one year of college mathematics. Deficiencies in undergraduate preparation may be removed concurrently with graduate work. The results of the Graduate Record Examination (GRE), including the advanced test in biology, must be submitted before or during the first quarter of graduate work. Students admitted conditionally to the Graduate School must have a GRE score of 950 or higher (combined quantitative and verbal) to be admitted to the M.A. or M.S. programs.

Completion of work for the Master of Arts and Master of Science degrees requires at least 32 hours in biology including: an acceptable thesis, Biology 501, continuous attendance in Biology 590, four courses in biology from numbers 400–489, 502–589, and a minimum of 8 hours of supporting work outside of the department. Election of a minor is optional. The Master of Arts degree requires a reading knowledge of a foreign language. The Master of Science degree requires demonstrated competence in any one of the doctoral research tools which is deemed appropriate for the student's program. Either one of these two programs is appropriate for students preparing to teach biology in junior college.

Students who satisfy the requirements for admission to the Graduate School and who have been approved for work in secondary education by the Education Division may qualify for teaching field study in the biological sciences. Entrance into the program requires an undergraduate



preparation of at least 20 junior-senior hours in the biological sciences, one year of college chemistry, and one course in physics or a suitable equivalent. This preparation should have included work in both botany and zoology, a course in genetics, physiology, and at least one field course. Any deficiencies involving the above requirements may be completed concurrently with work toward the degree. In addition to the requirements of the Education Division, the student matriculating for this degree must earn at least 16 hours and may earn as many as 32 hours of graduate credit in the biological sciences. Completion of the Master of Science in Education degree requires at least one quarter of Biology 504 (Instructional Innovation), and one quarter of Biology 590 (Graduate Seminar).

Areas of specialization possible within the biological sciences include biogeography, cellular biology, developmental biology, ecology, herpetology, ichthyology, mammalogy, micro-anatomy, parasitology, plant anatomy and morphology, sensory physiology, and taxonomy of vascular plants.

### **Business Education**

Graduate courses in business teacher education are taken as a major in the Faculty of Business Education leading to the Master of Science in Education degree. This program consists of a minimum of 48 quarter hours of course work distributed as follows: 24–32 quarter hours in Business Education and other Business Division courses; 8–16 quarter hours in Education Division courses; and 0–16 quarter hours of electives.

The graduate program is planned for those students who have an adequate subject matter and professional education background with teaching qualifications in at least one of the following business teaching areas: bookkeeping and accounting, data processing, basic business, consumer economics, distributive education, and secretarial and clerical.

Deficiencies in background must be eliminated by taking appropriate courses before the completion of 24 hours on the master's program. Those students who do not meet state certification requirements at the beginning of their program must do so in order to qualify for the degree.

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.

Specific requirements for the degree in addition to the general requirements of the Graduate School include:

1. Indication of proficiency in the subject matter and professional education areas as shown on a written examination taken during the last quarter of the graduate program or upon completion of all course work.

2. Indication of ability to explain and defend thesis as demonstrated on final oral examination. In the case of failure to pass either of these examinations, either one may be repeated, with committee approval, within a two-year period after additional preparation through course work, individual study, or revision of thesis.

3. Required courses in Business Education:
  - Business Education 500—Principles and Problems of Business Education.
  - Business Education 502—Research in Business Education.
  - Business Education 503—Tests and Measurements in Business Education.
4. Required core in professional education:
  - Measurement and Statistics—Met by Business Education 503.
  - Research—Met by Business Education 502.

One course from each of two of the following areas:

- a. Curriculum:
  - Education Administration 560—Curriculum.
  - Secondary Education 562—Workshop in High School Curriculum.
- b. Developmental Psychology and Learning:
  - Counselor Education 511—Educational Implications of Learning Theories.
  - Counselor Education 515—Psychological Aspects of Education.
  - Counselor Education 562b—Human Development in Education (Adolescence).
- c. Social Foundations:
  - Education Administration 431—History of Education in the United States.
  - Education Administration 554—Contrasting Philosophies of Education.
  - Education Administration 502—Seminar in Comparative Education.

5. A minimum of 5 hours and a maximum of 9 hours' credit in Business Education 599 (Thesis) is allowed for those students who choose to write a thesis.

The Graduate Committee consists of three members with the chairman from the Faculty of Business Education.

## Chemistry

Graduate courses are offered which lead to the Master of Science degree in chemistry or provide the cognate field concentration for the Master of Science in Education program in secondary education. A special program leading to the Master of Science degree may be arranged for students who plan to teach in junior colleges.

Students interested in any of these programs should consult the chairman of the Faculty of Chemistry for specific information. Following is a listing of the primary requirements which must be fulfilled in addition to the general requirements specified by the Graduate School:

### *Master of Science Degree*

1. Earned credit in Chemistry 490, 511a, 531, 541, 561 or 562, 575.
2. Research and Thesis, Chemistry 597, 5 to 9 hours.
3. Attendance at seminar (Chemistry 575).
4. A reading knowledge (or one year of undergraduate credit) of a foreign language approved by the student's advisory committee.
5. A final oral examination on the thesis.
6. If a secondary concentration in a field other than chemistry is elected, a minimum of 30 hours of credit must be earned in chemistry.

### *Master of Science in Education Degree*

1. From 16 to 32 hours of graduate credit in chemistry, and a total of at least 64 undergraduate and graduate hours in chemistry.
2. Program of study approved by the Graduate Committee of the Faculty of Chemistry.
3. A research paper on a topic approved by the Graduate Committee.
4. Satisfactory performance on an oral examination over the research paper and appropriate course material.

### **Education**

The Education Division offers graduate programs leading to the Master of Science in Education degree and the Sixth-Year Specialist's Certificate. At both levels, programs are available in counselor education, educational administration and supervision, and secondary education. The programs in elementary education and in special education lead to the master's degree only.

### *Master of Science in Education Degree*

For the Master of Science in Education degree, each student must complete an approved 48-hour program of study, which must include at least 24 hours earned in courses numbered 500. He must maintain a grade-point average on all graduate courses of no less than 4.00 on a 5.00 scale. Each student must also file with the Graduate Office a research paper approved by his adviser. In addition, he must pass a comprehensive oral final examination and fulfill all requirements of the Graduate School.

Each student who expects to work in the elementary or secondary school must meet the requirements for a teacher's certificate appropriate for his area as a prerequisite for completing a master's degree program. Students wishing to concentrate in Counselor Education for future work in business personnel offices or for pastoral counseling must meet the appropriate prerequisites for each of these areas. The student's adviser determines what prerequisites must be met.

Each program includes three areas of study: (1) the general-professional core, (2) the cognate field, and (3) the field of specialized-professional studies.

1. *The general-professional core:* The general-professional core consists of a block of studies that meets the pattern set forth below of 16 hours in general-professional courses for all students majoring in education.

The courses for the core are chosen with the approval of the student's adviser for his field of specialization and to avoid duplication of undergraduate courses. The student takes one course from each of groups *a* and *b* of the general-professional courses listed below. He also takes two courses from groups *c*, *d*, and *e* but the two must not be in the same group. If the student has taken any of the listed general-professional courses which may be out-dated for application to a master's degree program, he may substitute for each such course some other graduate course in education which his adviser approves as a part of his 16 hours of general-professional work.

*a. Measurement and Statistics:* Counselor Education 420, 422, 520, or 522.

*b. Research:* Educational Administration 500 (required by all).

*c. Curriculum:* Educational Administration 560, Elementary Education 561, Secondary Education 550, 562, or Counselor Education 542.

*d. Developmental Psychology and Learning:* Counselor Education 511, 515, 525, 562a, 562b; Special Education 414; or Psychology 407.

*e. Social Foundations:* Educational Administration 431, or 554, 502.

2. *The Cognate Field:* The student takes at least 15 hours in one cognate field or earn 12 to 18 hours in elective courses related to his teaching field, except for the student specializing in secondary education where a concentration consisting of 16 to 32 hours substitutes for the secondary concentration. In appropriate instances, the adviser may substitute needed education courses for some academic courses. This might be done where the student has strength in the latter but is deficient in the general-professional studies in education.

3. *The Specialized-Professional Field:* In addition to the core requirements, the student completes 14 hours or more in a sequence of study within a field of specialization in education, except in secondary education in which 8 to 16 hours are required. Specialties may be selected from the areas of educational administration and supervision, elementary education, counselor education, secondary education, and special education. The adviser plans with the student a balanced program that will build on the student's prior preparation for teaching.

#### EDUCATIONAL ADMINISTRATION AND SUPERVISION

The specialization in educational administration includes the following sequence: Counselor Education 420 or 422, Educational Administration 456, 500, 524, 560, Elementary Education 557, and Secondary Education 564; eight hours of additional required courses may be selected from Educational Administration 420, 502, 520, 554, Elementary Education 561, Secondary Education 508, 550, 562 or Counselor Education 542.

Students specializing in instructional supervision must select work in the following sequence: Counselor Education 420 or 422, Educational Administration 500, 560, Elementary Education 561 or Secondary Education 508, 550, 562, Educational Administration 524, 456, 556, and Counselor Education 515.

Candidates whose background does not include a strong academic concentration are encouraged to pursue a secondary concentration in an academic area. Candidates with strong undergraduate academic concentrations may take work in foundations, and counselor, elementary, or secondary education.

#### ELEMENTARY EDUCATION

Programs in elementary education are developed for the classroom teacher and for those who wish to concentrate in one of the following areas: language arts, reading, social studies, elementary mathematics, and elementary science. Each of these areas includes 16 hours in the general-professional core of courses, a carefully planned sequence of 16 hours in elementary education, and 16 hours of electives. The electives may be used to give breadth to the student's course of study or provide a degree of specialization.

A total of 48 hours is required for these programs.

Students specializing in elementary education select courses from the following: Elementary Education 415, 441, 442, or 541, 437 or 505, 542, 543.

#### COUNSELOR EDUCATION

The purpose of the counselor education program is to develop skills and techniques as they relate to the counselor's role. An understanding of human behavior, the helping relationship, counseling skills, and technical competencies are stressed.

Prescribed course sequences and integration of content material are considered essential in program planning. The student's progress is reviewed after completion of the first 24 quarter hours; therefore the following courses must be taken during that period: Counselor Education 420, 422, 542, 412 (Psychology 432 may replace Counselor Education 412). The remainder of the program must include the following in approximately this sequence: 562a or b, 537, 522, 545j and 541. During the first half of the program, an orientation to research techniques is considered essential. Educational Administration 500 or the equivalent research methods course is required. The student's adviser especially should be consulted in this phase of his program.

If a student plans to take a practicum experience as part of his master's program, he should take it at the end of the integrated sequence of courses.

#### SECONDARY EDUCATION

A program consisting of a minimum of 48 hours of work (16 hours in the general-professional core of courses, 8 to 16 hours in secondary education, and 16 to 32 hours in one of the undergraduate teaching subjects and/or cognate courses) is arranged jointly by the adviser of secondary education and the adviser of the subject matter area in which the student plans to teach. The student's undergraduate record, experience, and plans are taken into account in determining the number of courses in secondary education and subject matter to be taken. Appropriate elective courses are selected for those who plan to work in junior colleges or other institutions of higher education.

With the approval of his adviser, each student specializing in secondary education must select 8 to 16 hours (usually 8) of work in the following: Secondary Education 407, 505, 564, 570, 575, or 579; Special Education 414; Counselor Education 542, 543, or 562b; Instructional Materials 406, 417, or 546. The student is encouraged to take a special methods course in his teaching field.

#### SPECIAL EDUCATION

The program in special education leading to a Master of Science in Education degree is designed to prepare teachers of exceptional children and to enable them to qualify for certification to teach specific types of exceptional children. To be admitted to the degree program, the student must have a valid teaching certificate or he must qualify for one.

Students may specialize in an area of special education including the educable mentally handicapped, the emotionally disturbed, and the gifted. Each of these sequences requires certain background courses, such as child psychology, mental hygiene, and educational measurement. Students specializing in the educable mentally handicapped and the emotionally disturbed may also be required to take selected elementary education courses at the discretion of their advisers.

The program in the educable mentally handicapped prepares experi-

enced educators to teach children in state-approved classes. The core sequence includes, in order, the following special education courses: 414, 428, 410b, 413b, 481b, 420b, and 577.

The program in the emotionally disturbed is designed to prepare teachers of emotionally disturbed children in public schools or in institutions treating such children. The core includes the following sequence of special education courses: 414, 410a, 413a, 481a, 420a, and 577.

Experienced teachers enrolling in the program for the gifted must take the core sequence which includes the following special education courses: 414, 410c, 413c, 481c, 420b, and 577.

All students in these sub-specialties must take a course in research methods and submit a research paper approved by their graduate advisers. They must select electives in consultation with their advisers.

A fourth specialty is the Administration of Special Education. Applicants for this program must have teaching experience in Special Education. Since students in this program will have a wider range of skills and possess diversified backgrounds, broad programs are planned for two major objectives: (1) to give the student an understanding of and experience with several types of exceptional children, especially in sub-areas in which he has not taught, and (2) to develop his administrative competencies.

Local and state resources are used to give the student direct experience with exceptional children. These include the public schools of Madison and St. Clair counties, the Alton State Hospital and State Department of Mental Health; Specialized Services; Easter Seal Society; and the Madison County Health Center. In addition, a Special Education Diagnostic Center located on the campus provides a training resource for students, teachers, and auxiliary special education personnel.

### *The Sixth-Year Specialist's Certificate*

#### COUNSELOR EDUCATION

The Sixth-Year Specialist's Certificate Program requires a minimum of 45 quarter hours of work. The program is individually planned to meet the student's professional objectives. This program includes a minimum of 16 hours of practicum and/or internship. Specific courses and the sequence in which they are to be taken must be approved by the student's advisory committee.

#### EDUCATIONAL ADMINISTRATION AND SUPERVISION

Admission standards for the Sixth-Year Specialist's Certificate Program parallel the admission requirements for the Doctor of Philosophy degree program. Students admitted on a provisional basis must have the consent of the Dean of University Graduate Studies and Research. 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.

The program leading to the Sixth-Year Specialist's Certificate Program includes 8 hours of graduate courses in the foundation field, 16 hours in the area of educational administration, 5 hours in a field study, and either 8 hours in an internship or practicum, or additional course work for those with extensive administrative experience. The areas of specialization, the practicum, and the field study are individually planned in terms of the candidate's professional goals. Eight hours of cognate course work is also required. A comprehensive oral or written exam is required.

## SECONDARY EDUCATION

Admission standards for the Sixth-Year Specialist's Certificate Program parallel the admission requirements for the Doctor of Philosophy degree program. All candidates must have the master's degree or its equivalent.

The work leading to the Sixth-Year Specialist's Certificate Program is arranged in terms of the needs and objectives of the student. The program is designed to extend the competence of classroom teachers in the junior and senior high schools and the junior college. Candidates admitted to the program plan with an appointed committee an appropriate sequence of education and cognate courses of at least 45 quarter hours of credit. The candidate completes a field study or a practicum or both at the discretion of his committee. A comprehensive oral or written exam is required.

### English

Graduate courses in English may be taken for work leading to the Master of Arts degree and for the subject-master concentration in the Master of Science in Education degree program. Inquiries about admission should be sent to the graduate adviser, Faculty of English Language and Literature, Southern Illinois University, Edwardsville, Illinois 62025.

The Master of Arts degree in English permits the student to elect to write a thesis or to take a comprehensive examination. For either program the student must satisfy the following requirements:

1. Complete at least 48 hours of satisfactory course work in English.
2. Take English 500 in the first term it is available.
3. Take one course in English linguistics at the 400 level or take English 501.
4. Present two years of course work at the college level in a modern or a classical foreign language with at least a *C* average, or demonstrate proficiency in a foreign language.

For the thesis option:

1. Submit to the chairman, Faculty of English Language and Literature, an accepted thesis.
2. Pass a one-hour oral examination on the thesis and related areas.

For the examination option:

1. Submit to the chairman, Faculty of English Language and Literature, a clean copy of the research paper best representing his graduate work, such paper to have received a grade of *A* or *B* in an English course at the 400 or 500 level.
2. Pass the master's comprehensive examination on a reading list in English and American Literature and Linguistics.

A program leading to the Master of Arts degree for the junior college English teacher is also offered.

### Foreign Languages

In conjunction with the Education Division, the Humanities Division offers foreign language concentrations (French, Spanish, or German) in the program leading to the Master of Science in Education degree (secondary education). The program is designed primarily for prospective or in-service foreign language teachers in secondary schools who wish to improve their language and professional competence to graduate level standards of excellence.

Applicants for admission to a foreign language concentration must receive the approval of the Foreign Languages Faculty of the Humanities Division in addition to meeting the general requirements for admission to the Graduate School and the requirements of the Education Division for this program.

A foreign language concentration normally involves graduate level work in each of four areas of competence: language skills, language analysis, literature and culture, and professional preparation. Candidates normally take a minimum of four hours in each area with half of the total work on the 500 level.

No specific courses are required of all candidates. The work taken in each area varies according to the candidate's previous academic training, teaching experience, and language proficiency as demonstrated upon entrance into the program. The total minimum hours of work in the concentration is 16; the maximum, 32. An average of 24 hours is required to complete the concentration for those with undergraduate foreign language majors of 27 quarter hours beyond the intermediate college level. Candidates with deficient academic preparation but with demonstrated language proficiency may be admitted to the program but are expected to take closer to the maximum of 32 hours in the concentration. No candidate is considered as accepted in a foreign language concentration until it is established by consultation with the Education Division that his total needs in foreign language hours can be reconciled with his total education needs in the Master of Science in Education (secondary education) program.

To be retained in the foreign languages concentration of the program, candidates must maintain a *B* (4.0) average in the foreign languages work. Graduate work in a foreign language taken at other universities and in NDEA Institutes granting graduate credit is integrated into the concentration within the limits of the regulation of the Graduate School concerning the transfer of graduate credit.

### Geographical Studies

Programs leading to the Master of Arts, Master of Science, and Master of Science in Education degrees are offered. The basic requirements in each of the programs are similar and require: (1) a core program in the major subject area of geography; (2) a competence in a specialized area; and (3) a thesis or its equivalent to demonstrate research ability. Areas of specialization are cartography, cultural, economic, earth science, urban geography, and urban and regional planning. These specialization programs may include course work from related departments. Students not having an undergraduate concentration in geography are required to take undergraduate course work in deficient areas.

The basic core program requires graduate course work in the following areas:

1. Physical or Economic Geography.
2. Quantitative or Field Techniques.
3. Research Techniques.
4. Cartography.
5. Philosophy of Geography.

Sixteen or more quarter hours are required in an area of specialization. Twenty-four quarter hours of geography are required to list geography as a secondary concentration in the Master of Science in Education de-



gree. The Master of Science degree requires 56 hours, two research papers, and competence in quantitative techniques or field methods instead of a foreign language.

The chairman advises all graduate students prior to the appointment of a graduate adviser. A comprehensive preliminary examination is required and used in advising students. An oral defense of both the thesis outline and the completed thesis is required. The thesis outline must be developed with the advice of the thesis chairman and the student's advisory committee. After approval, the thesis title must be filed in the office of the graduate dean.

All general requirements of the Graduate School must be met.

### Government

Graduate courses in government may be taken as a major or minor leading to the Master of Arts degree, or as a concentration in government toward the Master of Science in Education degree.

The subject-matter fields in which students concentrate their study are:

1. American Government and Politics.
2. Comparative Politics.
3. International Relations.
4. Political Theory.
5. Public Administration.
6. Public Law.

All candidates for graduate degrees are expected to select one of these areas of concentration as their major field and to demonstrate special competence both in that field and in two other areas of concentration.

Departmental processing of applications for acceptance as a graduate student in government is the joint responsibility of the department's director of graduate studies and its chairman.

The director of graduate studies serves as adviser for all graduate students until such time as an advisory committee is named for the individual student. This should be done by the end of the second quarter in residence.

### *Master of Arts Degree*

Requirements for admission imposed by the department are in addition to those of the Graduate School. The department ordinarily considers accepting as potential candidates for the master's degree only persons who have graduated from an accredited four-year college or university with a 3.70 overall grade-point average and 4.0 grade-point average in their major, and who have completed a minimum of 21 quarter or 14 semester hours in the field of government or political science. The candidate must present course work or other evidence of competence in three fields of political science. Scores from the Graduate Record Examination—both the aptitude test and the advanced test in government—must be submitted. Persons who do not meet these minimal requirements or their equivalent can be considered for acceptance only on a petition to the department's director of graduate studies and chairman which, if granted, indicate the deficiencies to be made up by work that will not be counted toward the Master of Arts degree.

A minimum of 48 quarter hours of credit, no more than 9 of which may be for the thesis, constitutes the basic course requirements for the Master

of Arts degree. At least 24 of these hours must be in courses at the 500 level. The course work must be so planned as to include at least 9 hours of work in each of two areas other than the one in which the thesis is written.

A student who completes only the minimum of 48 hours of course work may devote no more than 9 of those hours to courses outside the department unless the work is in a cognate field which has been approved as a replacement for one of the areas of concentration within the department. In the latter event, as many as 16 hours in the outside field may be counted within the 48-hour minimum, and a minimum of 15 hours in the cognate field are required.

Each candidate for a Master of Arts degree must include in his studies the departmental course in the scope and method of political science (Government 499).

A student must maintain an overall 4.00 grade-point average in order to be eligible for the Master of Arts degree, and no more than 9 hours of work with a grade of *C* may be counted toward the Master of Arts. A student whose work at any time falls significantly below this average may be dropped from the graduate program after consultation between his adviser and the director of graduate studies.

Proficiency in one modern foreign language is one of the University's requirements for the Master of Arts degree. Foreign language proficiency is demonstrated by successful completion of an examination administered by the Foreign Language department which is designed to test reading ability equal to that expected of students who have completed two years of college-level training in the foreign language. Proficiency in a foreign language must be certified to the Graduate School at least three months prior to graduation.

A thesis of the usual form and scope is required for the Master of Arts degree. Additional course work is not accepted in lieu of a thesis.

The final oral examination covers the thesis and the major area in which it was written. It also tests the candidate's competence in his two minor areas.

## History

Programs leading to the Master of Arts degree in history and to a teaching concentration in history for the Master of Science degree in secondary education are offered by the Faculty of Historical Studies. The Master of Arts degree is recommended for students who plan to continue graduate studies at the doctoral level, or who desire to teach in junior colleges.

Each student will be individually advised in his program, and may elect courses in Ancient History, Medieval and Modern European History; Latin American and United States History; and other specialized fields.

In addition to the general requirements of the Graduate School, the following specific requirements apply for the degrees indicated:

### *Master of Arts Degree*

1. At least 32 of the required 48 hours of graduate credit must be in history. At least half of the history hours must be completed in courses at the 500 level.

2. The combined total of graduate and undergraduate hours in history must be no less than 64.
3. A thesis must be presented for which 8 quarter hours of credit is given at the 500 level.
4. A reading examination in a modern foreign language must be passed.
5. A final oral examination covering the thesis and other appropriate topics must be passed.

*Master of Science in Education Degree<sup>1</sup> (Secondary Concentration in History)*

1. At least 16 and normally 24 hours of graduate credit in history are required. Half of the hours in history must be at the 500 level.
2. The combined total of graduate and undergraduate hours in history must be no less than 64.
3. The program of courses in history must be approved by the graduate history adviser to provide adequate balance in areas of study.
4. A research paper of acceptable quality must be submitted.
5. A final oral examination covering the program of graduate study must be passed.

### Mathematical Sciences

Graduate work in the mathematical sciences may lead to the Master of Arts or the Master of Science degree. Courses are offered for students interested in applied mathematics, computer science, pure mathematics, or probability and statistics. Students may prepare for positions as junior college teachers, for positions in industry or government, or for advanced study in mathematics leading to the Ph.D. degree.

A program given jointly with the Education Division offers courses leading to the Master of Science in Education degree with a concentration in mathematics.

In addition to the general requirements of the Graduate School, the following specific requirements apply for the degrees indicated:

*Master of Arts Degree*

1. At least 40 of the required 48 hours of graduate credit must be in mathematics. Course work must include at least three of the following sequences: Mathematics 501, 520, 530, 551, 555.
2. A thesis which carries from 5 to 9 hours credit.
3. Reading ability in mathematical literature in French, German, or Russian.
4. Satisfactory performance on written examinations over three areas of mathematics.
5. Satisfactory performance on an oral examination over the thesis and other topics that are deemed appropriate by the examining committee.

*Master of Science Degree*

1. At least 32 of the required 48 hours of graduate credit must be in mathematics. Course work must include two of the following sequences: Mathematics 501, 505, 520, 530, 551, 555, 575, 580.

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<sup>1</sup> Master of Science degree students are advised in both the Social Sciences and Education Divisions, and their programs require the approval of two advisers. Candidates for this degree should have a strong undergraduate background in history in order to qualify for graduate work.

2. A thesis or a research paper.
3. Satisfactory performance on written examinations over three areas, two of which must be mathematical.
4. Satisfactory performance on an oral examination over the research paper and other topics that are deemed appropriate by the examining committee.

*Master of Science in Education Degree (Concentration in Mathematics)*

1. From 16 to 32 hours of graduate credit in mathematics with at least 8 hours in mathematics at the 500 level. Specific courses are chosen to fit the background and needs of individual students.
2. A research paper.
3. Satisfactory performance on an oral examination over the research paper and course material.

### Music Education

In addition to the general requirements of the Graduate School, requirements for the Master of Music Education degree with a concentration in music education are:

1. Entrance examinations in Music Theory, Music History-Literature, and in Music Education must be passed before a student is permitted to enroll in 500-level courses in those areas.

Students planning to do a recital in lieu of a thesis must pass a performance audition prior to enrolling in applied study. Twelve hours' credit in the applied area are required.

2. A minimum of 18 hours in music education courses. Six hours of professional education courses may be substituted, upon approval of the adviser.

3. Specific courses required: Music 501-3, 502a-3, and 599-6.

4. Elective courses in music to make a total of 48 hours for the degree. Cognate courses, up to a total of 6 quarter hours' credit, may be used, upon approval of the adviser.

5. Twenty-four or more hours must be in courses at the 500 level.

6. A thesis is normally expected. However, a student who desires to perform a recital and submit a supporting paper for the recital, in lieu of the thesis, may do so upon approval of his adviser and auditioning committee.

### Physics

The Faculty of Physics offers a program of study leading to the Master of Science degree. Two courses of study are available: the Master of Science degree in Physics and the Master of Science in Education degree with a concentration in Physics for students planning to teach at pre-college levels. Students planning to teach at the junior college level are advised to enter the Master of Science in Physics program since junior colleges are generally requiring a Master of Science degree in the subject matter area. Students who plan to earn either degree in physics are governed by the regulations in this catalog with respect to scholastic attainment, hours of credit, residence, foreign language competence, and time limitation for completion of the program.

### *Master of Science Degree*

In addition to the general rules, the Faculty of Physics specifies requirements which are outlined below.

1. *Admission.* A student with a baccalaureate degree who satisfies the general requirements for admission to graduate work may qualify for this program provided he has a 4.0 average in an undergraduate concentration in physics or has permission of the physics graduate faculty. A student with an undergraduate concentration in a field other than physics may enter this program if he has completed 20 hours of physics at the junior-senior level with a 4.0 average or has permission of the physics graduate faculty.

2. *Program of Study.* In order to receive the degree, a candidate must satisfy the general requirements of the graduate school and must earn at least 30 hours of graduate credit in physics with an average grade of 4.0 or higher. The remaining 18 hours must be in electives approved by the student's advisory committee. These are generally in mathematics, engineering, or chemistry. However, students interested in junior college teaching might well benefit from courses such as Education 565-4 or Science and Technology 415-1 to 3. This program of study must include the following physics courses: 510a, 510b, 530a, 530b, 575, and 590.

The remaining 12 hours must be selected from 400-500 level physics courses. Before a student is accepted as a candidate for this degree, his proposed program of study must be approved by his Advisory Committee.

3. *Advisory Committee.* Each candidate's program is supervised by a committee of the Physics Graduate Faculty composed of a chairman and at least two other members. Initially the chairman of the committee is the Graduate Adviser who appoints the other members of the committee.

When the student begins his research work, the student's research supervisor becomes the chairman of the committee.

If the student elects a secondary concentration, a graduate faculty member from that discipline should be a member of the committee.

4. *Examination.* In order to qualify for the proposed degree and to begin research work for a thesis, the candidate must pass a written examination under the supervision of his Advisory Committee. The Graduate Adviser solicits from the Physics Graduate Faculty appropriate questions from which the Advisory Committee chooses the questions for the examination. The Graduate Adviser is responsible for administering the examination, which is graded by the committee. A unanimous vote is required for a passing grade.

The examination is given in two parts. Part I covers topics from the fields of classical mechanics and electromagnetic theory; and Part II from the fields of atomic, nuclear, and solid state physics, kinetic theory, thermodynamics, statistical mechanics, optics, and quantum mechanics.

5. *Thesis.* Each candidate must submit to the Graduate School and to the Science and Technology Division a thesis based on his work in an approved physics research program. After a thesis, acceptable to this Advisory Committee, is submitted, the candidate must pass an oral examination in order to be certified for the degree.

### *Master of Science in Education Degree*

In addition to the general rules, the Faculty of Physics specifies the following requirements.

1. *Admission.* A student who satisfies the requirements for admission to the Master of Science program (Section B. 1) and has been approved for work in secondary education by the Education Division may qualify for a program leading to the Master of Science in Education degree with work in physics.

2. *Program of Study.* In order to receive the proposed degree, a candidate in addition to the general requirements and the requirements of the Education Division, must earn at least 16 hours of graduate credit in physics and may earn as many as 32 hours of graduate credit in physics toward the degree. The student must have at least a *B* (4.0) average in all graduate work in physics as well as a 4.0 average in all graduate work; at least 6 hours of physics courses must be at the 500 level.

Before a student is accepted as a candidate for this degree, an Advisory Committee must be formed for this student consisting of at least one member from the Physics Graduate Faculty.

3. *Research Paper.* A research paper or thesis approved by the student's Advisory Committee is required of all candidates for this degree.

4. *Examination.* As required by the general rules of the graduate school, a candidate for this degree is required to pass a comprehensive oral examination of his graduate work under the supervision of his Advisory Committee.

The research activity of the Faculty of Physics is concentrated in two main areas, solid state physics and plasma physics. The Solid State Laboratory consists of a General Electric XRD6 Single Crystal Diffractometer, a Varian 12" Magnet system with Fielddial Mark II control, fast pulse instrumentation, microwave equipment, and sample preparation equipment. The Plasma Physics Laboratory possesses a 132 KVA Plasma Flux Magnet System, a magnetic pinch device, and work is progressing on a Cesium plasma Q-machine. A fast flow microwave discharge system is being constructed to study molecule-atom energy transfer. Optical, electrical, and microwave diagnostics are also available. There is a well-equipped machine shop, an electronics shop, and glass-blowing facilities. The Science Laboratories possess GE-265 time-sharing computer terminals, and IBM 1401 and 1620 computers are housed in the adjacent building. Access to an IBM 7040 is also available.

Graduate students in physics are eligible for fellowships awarded by the Graduate School. A typical stipend is \$2400 for the academic year plus tuition. Teaching assistantships of up to \$2700 plus tuition for the academic year are available from the Faculty of Physics. Teaching assistants are assigned teaching duties requiring a total of 15 hours per week during the academic year. This typically involves about 6 contact hours per week. Additional financial support is available during the summer months. Several research assistantships are also available for qualified students. Applications for assistantships should be received by March 1.

## Psychology

A Master of Arts and a Master of Science degree are offered in psychology. A minimum of 60 quarter hours of acceptable graduate credit is required for either degree. A candidate for the Master of Arts degree is also expected to demonstrate reading proficiency in a modern foreign language. Each candidate must submit a thesis as evidence of his knowledge of formal research techniques.

Because of the general flexibility of the program, several options are available for students seeking preparation for entry into such professional areas as school psychology, teaching, and industrial psychology or into advanced graduate programs in psychology.

Separate application forms for both the psychology faculty and the Graduate School are required; both the faculty's admissions committee and the Graduate School must grant their approval.

While an undergraduate concentration in psychology is desirable, capable students from other academic concentrations interested in psychology may enter the graduate program provided they have had at least *one* course in each of the following: applied psychology, statistical methods, and experimental psychology. The prospective enrollee must submit results of the Miller Analogies and the Graduate Record Examination and must show at least a *B* average in his major undergraduate field.

A tentative plan of study must be approved by the psychology adviser. Course work includes a core program required of all candidates. The core consists of 501-12 Proseminar in General Psychology, 520-4 Research Design and Inference I, and 599-6 to 9 Thesis. In addition, 521-4 and 522-4 Research Design and Inference II and III or 593-8 Practicum in Psychology is required. The remaining 27-30 hours of the program are electives which must include a sequence of three or more courses in at least one area of psychology (child, learning and motivation, perception, personality, social) to assure some work in depth in a chosen field.

A variety of research and practicum experience is important. All students are expected to participate in research or practicum experiences.

### Sociology

The Sociology Faculty offers a program of study leading to the Master of Arts and the Master of Science degrees. In addition to the general regulations of the Graduate School, the following conditions pertain.

1. Course work must include 20 quarter hours distributed among the following areas (1) Methodology, (2) Statistics, (3) Methods of Field Research, (4) Sociological Theory, and (5) Social Psychology.

Of the 48 hours required for graduation, a student may earn a maximum of 8 in independent reading and thesis research; however, approval of the candidate's thesis must be obtained before credits for these are approved.

2. A student must pass a comprehensive written examination in which he demonstrates general knowledge of sociology. This examination is given in three parts of two hours each usually in the spring.

3. Candidates for the Master of Arts degree must submit a thesis based on original research and pass an oral examination in defense of the thesis.

4. Reading knowledge of one foreign language must be demonstrated by passing the appropriate foreign language examination as provided by the Foreign Languages Faculty.

The requirements for the Master of Science degree are the same as for the Master of Arts with the following exceptions: (1) a research paper may be offered in lieu of a thesis, and (2) reading knowledge of a foreign language is not required.

Applicants should apply to the chairman of the Faculty. Detailed statements of departmental requirements for master's degrees are available upon request.

# 3 / Course Descriptions

HERE ARE DESCRIBED all of the courses offered by the University at the Edwardsville Campus 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	Higher Education
Anthropology	History
Art	Instructional Materials
Biology	Management
Business Administration	Management Operating Systems
Business Education	Marketing
Chemistry	Mathematics
Counselor Education	Music
Economics	Personnel and Industrial Relations
Educational Administration and Supervision	Philosophy
Elementary Education	Physical Education
Engineering	Physics
English	Production
Finance	Psychology
Foreign Languages	Quantitative Methods
General Foreign Language	Rehabilitation
French	Science and Technology
German	Secondary Education
Spanish	Social Welfare
Romance Philology	Sociology
Geography	Special Education
Government	Speech
Health Education	Speech Pathology and Audiology
	Theater

## Explanation of Entries

The first entry for each course is a three-digit numeral which serves to identify the course. Courses numbered 400–499 are open to both seniors and graduate students. Courses numbered above 499 are for graduate students only.

Following the course identification number is another number, which indicates the maximum credit allowed for the course. The maximum may vary, and specific credit hours may be assigned for each quarter a course is given.

After each course description are listed the prerequisites, if any, which must be satisfied by the student before the student is permitted to enroll in that particular course.

To learn when a course is offered, the student should consult the Schedule of Classes which may be obtained from Central Publications, Southern Illinois University, Edwardsville, Illinois 62025. When requesting a schedule, please specify the quarter desired (fall, winter, spring, or summer).



### Accounting

**442-4 Advanced Cost Accounting.** Managerial control and profit planning through capital budgeting, inventory planning, subjective probabilities, statistical methods, and operations research; direct and relevant costing; nonmanufacturing costs; differential and comparative cost analysis. Prerequisite: 341.

**453-4 Advanced Accounting.** Advanced study of accounting principles and procedures relating to specialized topics, including partnership equity, installment and consignment sales, insurance, compound interest, and preparation and use of consolidated statements. Prerequisite: 351b.

**456-4 Auditing.** Objectives, standards, and procedures involved in examining and reporting on financial statements of business organizations. Prerequisites: 341, 351b.

**458-4 Accounting Systems.** Problems in accounting systems design and installation. Examination of existing systems and practice in system design and reports. Prerequisites: 331, 341, 351b.

**461-4 Advanced C.P.A. Problems.** A course using problems from the American Institute of Certified Public Accountants' examinations given in recent years and supplementary problems from selected sources. Prerequisites: 341, 351b.

**530-4 Conceptual Framework of Accounting.** Accounting records of income measurement, price level, principles of financial statement analysis, and fund flow statements. Restricted to Master of Business Administration students.

**533-4 Managerial Accounting.** Consideration of programs and techniques of internal control and reporting for management, cost concepts and applications, variable costing, cost-volume-profit relationships, budgeting concepts, and complex problems for managerial decision. Prerequisite: 530.

**538-4 Seminar in Accounting.** Comprehensive study and research in selected areas of accounting related to students' special interests. Prerequisite: 533.

### 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."

**404-4 Primitive Art and Technology.** The development of man as an art-loving and a tool-using being. Artistic and technological tradition of non-Western peoples, past and present.

**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.

**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.

**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.

**416-4 Culture Change.** Examination of long and short range culture change, acculturation process and innovation, theory and method of study of culture change.

**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.

**483-3 to 18 Individual Study in Anthropology.** Guided research upon anthropological problems. Students should consult chairman before enrolling.

**507-9 (3,3,3) Pro-seminar in Social Anthropology.**

**508-8 (4,4) Pro-Seminar in Cultural Anthropology.** (a) Theory and method of anthropology. Cultural variables and human behavior, formulation of problems and their research according to preferred anthropological techniques, case studies in theory and method. (b) Acculturation and applied anthropology. Variables influencing culture change, planning and culture change, case studies in culture change.

## Art

**Art Education:** 408, 460, 466, 560, 566.

**Art History:** 483, 571.

**Studio:** 401, 405, 406, 410, 416, 420, 426, 441, 501, 502, 511, 520.

401-2 to 12 **Research in Painting.**

405-2 to 12 **Studio in Sculpture.**

406-2 to 12 **Studio in Painting.**

408-4 **Art Education for Elementary Teachers II.**

410-2 to 12 **Research in Prints.**

416-2 to 12 **Studio in Prints.**

420-2 to 12 **Research in Pottery.**

426-2 to 12 **Studio in Pottery.**

441-2 to 6 **Studio in Drawing.**

460-2 to 12 **Research in Art Education.**

466-2 to 12 **Studio in Art Education.**

483-3 to 12 **Research in Art History.** Individual research in the painting, sculpture, architecture, and related arts of the various periods.

501-2 to 12 **Seminar in Painting.**

502-2 to 12 **Seminar in Sculpture.**

511-2 to 12 **Seminar in Prints.**

520-2 to 12 **Seminar in Pottery.**

560-2 to 12 **Seminar in Art Education.**

566-2 to 12 **Research in Art Education.**

571-2 to 5 **Readings in Art History.**

599-5 to 9 **Thesis.**

## Biology

**410-4 Advanced Genetics.** A study of quantitative inheritance, chromosomal evolution and organization, the regulation of gene action, and radiation genetics. Three lectures, one laboratory per week. Prerequisites: 303a, GSD 114d.

**415-4 Experimental Embryology.** A survey of the literature from the beginning of experimental embryology; laboratory includes classical and modern techniques. Two lectures, two laboratories per week. Limited to ten students. Prerequisite: 301c and organic chemistry (or concurrent registration).

**420-4 Plant Synecology.** The structure, development, and causative factors in the distribution of plant communities. Field techniques for quantitative measurements and interpretations of successional dynamics are stressed. Three lectures, one laboratory per week. Saturday field trips required. Prerequisite: 303c.

**423-4 Principles of Parasitism.** Principles dealing with parasitic relationships. Includes study of types of association, morphologic, and physiologic adaptations of parasites, defensive mechanisms, immunity and specificity. Selected examples from plants and animals are used to illustrate the general principles and life histories. Two lectures, two laboratories per week. Prerequisite: 302 a,b,c.

**435-4 Ethology.** A survey of animal interactions and the response of animals to environmental stimuli. Three lectures, one laboratory per week. Prerequisite: 302a.

**441-3 Mammalian Physiology.** Nervous and endocrine coordinating processes, sensory function, circulation, respiration, alimentation, and regulation of body fluids, with special reference to man. Three lecture hours per week. No graduate credit. Prerequisites: organic chemistry and 302d or GSA 310.

**442-1 Mammalian Physiology Laboratory.** Selected experiments with mammals including man. One three-hour laboratory per week. No graduate credit. Prerequisite: concurrent enrollment in 441.

**444-4 Integrative Physiology.** Mechanisms of response and integration with emphasis on the role of the nervous system. Three lectures, one laboratory per week. Prerequisites: 301a, 302a, and organic chemistry (or concurrent registration).

**447-4 Topics in Plant Physiology.** Photosynthesis, mineral nutrition of plants,

- water regime, growth and movement of plants. Two lectures, two laboratories per week. Prerequisites: 302c, Chemistry 111a,b,c.
- 455-4 Plant Anatomy.** Developmental and comparative studies of seed plants including structure of vegetative and reproductive parts and embryology. Three lectures, one laboratory per week. Prerequisite: 302c.
- 458-5 Functional Morphology of Vertebrates.** The phylogenetic approach to comparative form, function, and development of vertebrate organisms. Two lectures, three laboratories per week. Prerequisite: 302a.
- 470-4 Field Botany.** Taxonomy, natural history, and distribution of local plants. Two lectures, two laboratories per week. Cost of field trips may be \$10-\$25 per student. Prerequisite: 302c.
- 480-4 Field Zoology.** Taxonomy, natural history, and distribution of local animals. Two lectures, two laboratories per week. Cost of field trips may be \$10-\$25 per student. Prerequisite: 302a.
- 485-4 Ichthyology.** Relationships, ecology, behavior, physiology, and anatomy of fishes. Field study of local fauna is stressed. Two lectures, two laboratories per week. Saturday field trips required. Prerequisite: 302a or consent of instructor.
- 486-4 Herpetology.** A study of amphibians and reptiles, their evolution, relationships, morphology, and behavior. Two lectures, two laboratories per week. Saturday field trips required. Prerequisite: 302a,c or consent of instructor.
- 488-4 Mammalogy.** Taxonomy, natural history, and evolution of animals. Two lectures, two laboratories per week. Prerequisite: 302a.
- 493-2 to 8 Research in Biology.** No credit toward a secondary concentration in biology. Prerequisites: senior standing, consent of department.
- 497-2 to 8 Biology Field Studies.** A trip of four to eight weeks to acquaint students with animals or plants in various environments and/or with methods of field study, collection, and preservation. Arrangements made in advance of term; travel costs borne by student. No credit toward a secondary concentration in biology. Prerequisite: consent of faculty.
- 501-2 Research Orientation.** An intensive study of several widely divergent problems in biology with special reference to the development of concepts and investigative techniques.
- 504-9 (3,3,3) Instructional Innovation in Secondary School Biology.** A laboratory-oriented workshop of group participation in varied approaches to experimentation and problem solving in the biological sciences.
- 506-4 Cellular Regulation.** The effects of the physical and chemical environment on cellular processes and activities (e.g. on the cell growth and division, metabolism, ultrastructure, and biochemistry.) The molecular bases for the responses for the cell to changes in the environment are stressed. Four hours lecture per week. A term paper is required. Prerequisites: 301b, two quarters of organic chemistry.
- 511-4 Population Genetics.** Genetic structure of populations, factors causing changes, and principles governing rate and direction of change. Prerequisite: 303a.
- 512-4 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: 303a.
- 521-4 Limnology.** Principles exemplified by the lakes and streams of southern Illinois. Cost of field trips may be \$10-\$25 per student.
- 524-3 Biogeography.** Concepts and principles relating to patterns of plant and animal distribution on a continental and world-wide basis. Prerequisite: 303c.
- 545-3 Physiology of Sense Organs.** Structure and function of selected sense organs, including physiochemical processes in transducer action by receptors and handling of sensory messages. Prerequisite: 303d.
- 547-3 Mineral Nutrition of Plants.** Mineral absorption, accumulation, and requirements of plants with special reference to the physical chemistry of cellular membranes. Prerequisite: 447.
- 553-4 Morphology of the Spermatophytes.** A seminar on the current theories concerning the origin, evolution, and trends of specialization in seed plants. Prerequisite: 455.
- 580-4 Advanced Invertebrates.** The nature and life of invertebrate animals with emphasis on comparative form, function, behavior, and occurrence. Prerequisite: 302a.

**581-4 Helminthology.** Identification, morphology, physiology, and life histories of parasitic worms. Prerequisite: 423.

**590-3 (1,1,1) Graduate Biology Seminar.** Lectures presented by faculty, visiting investigators, and students. Students present one seminar per quarter. Continuous attendance required.

**591-1 to 4 Readings in Biology.** Supervised readings in specialized areas. No credit toward a secondary concentration in biology. Prerequisite: consent of instructor.

**593-1 to 4 Special Problems in Biology.** Supervised investigation. Prerequisite: consent of instructor.

**599-2 to 9 Research and Thesis.**

## Business Administration

**440-4 Legal Environment of Business.** The varied facets of the external and internal legal environments within which business firms operate. Further development of analytical skills is attained through the use of cases and readings which describe and analyze the legal framework supporting, facilitating, and guiding everyday business decisions. Common law, statutory law, and administrative law as they affect the business environment.

**441-4 Business Policy.** Development of a top-management view leading to the formulation of general policies to be followed by the organization. Determination of objectives, the development of plans for their achievement, organizing administrative personnel to carry them out, implementation of programs, measurement of results, and the reappraisal of objectives, plans, and action-patterns in the light of evolving situations. Prerequisites: 341, 440.

**511-4 Accounting Theory.** Contemporary advanced accounting theory, including controversial issues with emphasis on net income determination and asset valuation; particular attention given to current publications of the professional and governmental agencies.

**526-4 Managerial Economics.** A course in the economics of the firm. Emphasizes demand, costs, prices, and profits in developing a conceptual business-decision framework.

**539-4 Seminar in Finance.** Current issues and practices in business finance. Student selects a problem for intensive exploration and reports his findings to the class.

**540-4 Concepts of Managerial Performance.** Emphasizes the role of management in achieving efficient work organizations. Reviews the various approaches to management as a foundation of realistic understanding of the broad range of problems confronting managers. Case problems supplement text materials. Restricted to Master of Business Administration students.

**541-4 Business and Its Legal Environment.** The legal framework within which business operates. Social, political, and economic environmental influences brought to bear on a firm by law. Specific relationships of this government to business, resulting from the anti-trust laws, the regulatory commissions, and government ownership of productive facilities. Restricted to Master of Business Administration students.

**542-4 History and Theory of Management.** An analytical study of the background and growth of management theory from its early beginnings to the present. Emphasis largely on the theory and practice of business management.

**543-4 The Administrator.** A focus upon the changing issues faced by managers in their efforts to achieve better management of human resources. The point of view is that of the line manager rather than that of a personnel-staff specialist. The case method facilitates the search for sensitive understanding and operational guidelines; the goal is to develop leadership patterns conducive to a satisfying, as well as an efficient, organizational entity. Prerequisite: 540.

**544-4 The Methodology of Business Research.** Basic concepts and techniques appropriate to research for business; research as a basis for creative decision-making in diverse business situations. Formulation of hypotheses; development of appropriate models and methodology for testing of hypotheses; presentation of research results; evaluation of the research results of others. Students are assisted in designing individual and group research projects having relevance for later seminars. Should be taken at the beginning of the second year.

**545-4 The Social Framework of Business.** Critical examination of the role of business in modern society. Emphasis on the large corporation, the responsibility of its management, the relationship of the corporation to the individual, the professional role of the manager, and the efficient management of the firm's resources. Prerequisite: 541.

**548-4 Seminar in Managerial Performance.** Depth study of a limited range of current problems and developments in management development, compensation, management by objectives, task-team leadership, and sensitivity training. Emphasis on the planning and leadership roles of management. Selection of topics is guided by the interests of the students and instructor. Prerequisite: 543.

**549-4 Corporate Policy Formulation and Administration.** A comprehensive, integrative course, focusing on the development and implementation of corporate strategy. Students analyze and diagnose complex business situations, bringing together their prior work in all areas of graduate study. Written analyses of cases and a four-hour final examination provide opportunity for appraisal of student's overall comprehension. Prerequisite: final quarter standing.

**559-4 Seminar in Marketing.** Students select and defend, on an individual basis, problems in marketing theory, research, and policy. May be repeated once with consent of department.

### 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: 304 or equivalent.

**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.

**405-4 Teaching Basic Business Subjects.** 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.

**406-4 Teaching Office Practice.** Instructional methods and materials for, and the evaluation of pupil performance in office practice.

**408-3 Teaching Data Processing and Bookkeeping.** Instructional methods and materials for, and the evaluation of pupil progress in data processing and bookkeeping.

**414-6 (3,3) Organization and Administration of Cooperative Vocational Business Education.** (a) Philosophy and objectives of cooperative vocational programs, methods of selecting students and work stations, placing and supervising students on part-time jobs. (b) Preparation of instructional materials, job analysis, conducting related information classes, evaluating workers and work stations, advisory committees, public relations aspects of cooperative programs.

**415-6 Supervised Business Experience and Related Study.** Designed to prepare teachers and coordinators of in-school and cooperative vocational business education programs in accordance with the requirements of the Illinois State Plan for the Administration of Vocational Education. First week (15 hours) devoted to classroom study of the principles and problems of coordinating in-school and cooperative vocational business education programs; next five weeks (200 hours) devoted to supervised occupational experience; seventh week (15 hours) devoted to classroom analysis and evaluation of on-the-job experiences of the members of the class in relation to their future work as coordinators and vocational teachers. Each student applies for and obtains his own position with the assistance and approval of the instructor. While employed, each student looks for and analyzes relationships between his work experiences and the in-school or cooperative work experience program he will later conduct.

**417-4 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 applicable to high school students. Approximately one-third of course is

spent in machine operation. Prerequisite: Management Operating Systems 280.

**426-4 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.

**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.

**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: 426 or consent of instructor.

**500-4 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.

**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.

**503-4 Tests and Measurements in Business Education.** The selection, construction, administration, and interpretation of tests and test scores in business education subjects. Principal emphasis on teacher-made tests, especially of the performance type, with secondary attention to published tests in the field.

**505-2 to 16 Workshop in Business Education.** Major issues in business teacher education. Ordinarily offered during one or two weeks of the summer session.

**507-4 Teaching Data Processing.** A consideration of problems inherent in the teaching of data processing in secondary and post-secondary schools. Evaluation of curricula, objectives, course content, evaluation, and teaching materials. Prerequisite: 417.

**508-4 Administration and Supervision in Business Education.** History and philosophy of administration and supervision in Business Education with consideration of problems arising at local, state, and national levels; and at secondary, college, and university levels. Supervisory problems include curriculum construction and evaluation, classroom supervision, promotional policies, selection of textbooks, purchase and maintenance of equipment, physical arrangements, and other areas according to need of students.

**509-4 Improvement of Instruction in General (Basic) Business Subjects.** Designed for the experienced high school teacher who is interested in the study of curriculum and teaching problems in basic business subjects. Includes teaching procedures, review of materials, formulation of tests, and evaluation. The organization of teaching units and projects is emphasized.

**510-4 Improvement of Instruction in Secretarial Subjects.** Designed for the experienced high school teacher who is interested in the study of curriculum and teaching problems in secretarial subjects. Includes teaching procedures, review of materials, formulation of tests, and evaluation.

**590-2 to 5 Readings in Business Education.** Supervised readings in selected subjects. Prerequisite: consent of instructor.

**591-2 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.

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

## 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. Four lecture hours per week. Prerequisite: 461b.

**412-3 Inorganic Preparations.** A study of several important inorganic syntheses. One lecture, six laboratory hours per week. Prerequisites: 235; 305b or 341c.

**432-8 (4,4) Instrumental Analytical Measurements.** Theory and practice of instrumental analytical measurements, including spectrophotometric, electro-analytical, and chromatographic methods. Two lecture, six laboratory hours per week. May be taken in either sequence. Corequisite: 461b.

**433-3 Intermediate Quantitative Analysis.** A study of the analysis of complex materials, with emphasis on separations, functional group analysis, and instrumental applications. Two lecture, three laboratory hours per week. Prerequisites: 432a or b, 461c.

**444-3 Organic Reactions.** A review of fundamental principles and an introduction to advanced topics. Three lecture hours per week. Prerequisite: 341c.

**446-4 Qualitative Organic Analysis.** A systematic study of the separation and identification of organic compounds. Two lecture, six laboratory hours per week. Prerequisite: 305b or 341c, and 345b.

**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 methods of procedure in the field of quantitative organic chemistry. One lecture, six laboratory hours per week.

**451-6 (3,3) Biochemistry.** (a) Carbohydrates, lipids, amino acids and proteins, nucleic acids and nucleoproteins, enzymes. (b) Vitamins and coenzymes, metabolism of carbohydrates, lipids, amino acids, and proteins, energy metabolism, hormones. Must be taken in a,b sequence. Prerequisite: 235, 305b, or 341c.

**455-2 (1,1) Experimental Methods in Biochemistry.** (a) Some modern separation techniques. (b) Biochemical preparations, syntheses and methods of identification. Prerequisite: concurrent enrollment in 451a.

**460-5 Theoretical Chemistry.** Traditional aspects of physical chemistry without the requirement of calculus. Four lecture, three laboratory hours per week. Prerequisites: 235; 305b or 341c, and one year of physics or consent of instructor.

**461-12 (4,4,4) Physical Chemistry.** A fundamental course in physical chemistry. Three lecture, three laboratory hours per week. Must be taken in a,b,c sequence, and each is a prerequisite for the next course in the sequence. Prerequisites: 235 (concurrent), 341c, 12 hours of physics, and one year of calculus.

**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. Three lecture hours per week. Prerequisite: 461c.

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

**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 a 4.00 grade-point average, and consent of chairman.

**511a-3 Advanced Inorganic Chemistry.** Theoretical and empirical treatment of chemical bonding and molecular structure. Prerequisite: 461c.

**517-3 Laboratory Techniques in Inorganic Chemistry.** Advanced techniques for the inorganic research chemist. Prerequisites: 412; 511a, consent of instructor.

**519-2 to 30 (2 to 6 per quarter) Advanced Topics in Inorganic Chemistry.** Selected topics such as kinetics of inorganic reactions, stereochemistry of inorganic systems, chemistry of coordination compounds, nonaqueous solvent systems, and others. Prerequisites: 511a, consent of instructor.

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

**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. Prerequisite: 432.

**541-3 Advanced Organic Chemistry.** An advanced course covering covalent bonding, structure, stereochemistry, reactions, reaction mechanisms, substituent effects, correlation of physical and chemical properties, and physical methods in organic chemistry. Lecture. Prerequisite: 444.

**547-3 to 6 Advanced Laboratory Preparations in Organic Chemistry.** Prerequisites: 446, consent of instructor.

- 549-2 to 30 (2 to 6 per quarter) Advanced Topics in Organic Chemistry.** Specialized topics in organic chemistry. The topic to be covered is announced by the department. Prerequisite: 543.
- 561-3 Chemical Thermodynamics.** Basic methods and theories as applied to chemical problems. Lecture. Prerequisites: 461c.
- 562-3 Atomic and Molecular Structure.** A survey of basic principles in atomic spectroscopy, quantum chemistry, and statistical thermodynamics. Lecture. Prerequisite: 561.
- 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.
- 575-1 to 3 Graduate Seminar.** Advanced level talks presented and discussed by graduate students. Required for all graduate students.
- 597-3 to 15 Research and Thesis.** Prerequisite: consent of chairman.

### Counselor Education

- 410-4 (2,2) Dynamics of Campus Leadership.** Organized presentation of accurate information about the University's historical development and plans for future growth, organizational structure, philosophy, administrative policies, and goals with emphasis on the role of student groups in the educational community. (a) Elected or potential student leaders. (b) Resident assistants. Prerequisite: consent of instructor.
- 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.
- 422-4 Educational Measurements I.** Study of the philosophy and techniques of measurement. Special attention to the construction and use of teacher-made tests and basic concepts related to standardized tests. Prerequisite: 305.
- 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.
- 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 are delineated with special reference to the public school administration, counselor, and social workers, the court, probation officers, and police. Prerequisite: consent of instructor.
- 485-4 to 9 Workshop in Educational Utilization of Community Resources.**
- 501-2 to 8 Special Research Problems.** For majors in Counselor Education. Formulating, investigating, and reporting on a problem in the area of guidance. Prerequisites: advanced standing, consent of instructor.
- 510-4 College Student Personnel Services.** An overview of the student personnel program in higher education for the beginning graduate student. Various types of organizational structures in higher education. Description and discussion of the functions of college student personnel programs, with emphasis on the organizational relationships of the various functions. Prerequisite: admission to program.
- 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.
- 515-4 Psychological Aspects of Education.** Designed to survey the applications of psychology to educational settings. Prerequisite: advanced standing.
- 520-8 (4,4) Educational Statistics and Experimental Design.** (a) Statistical methods needed for educational research. Includes tests of significance, non-parametrics, 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. Prerequisites: 422b, 570a.
- 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. Prerequisites: 420, 422.

**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 instructor.

**526-4 Techniques in Individual Guidance.** Each student employs psychometric procedures, makes observations, and holds interviews with a pupil, his parents, teachers, and others. Prerequisite: consent of instructor.

**528-4 Advanced Guidance of the Individual.** A continuation of 526. Techniques and the methods of treatment applicable 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.

**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.

**536-12 (4,4) Appraisal of Intelligence.** (a) Child. Individual instruction in administering the Revised Stanford-Binet Tests. Instruction designed to assist student to interpret the test results. Additional individual instruments introduced. Emphasis on early childhood testing. Prerequisite: 535. (b) Child and Adult. Individual instruction in administration and interpretation of the Wechsler tests. Instruction designed to assist student in report writing. Emphasis from early childhood to adulthood. Prerequisite: 535. (c) Preschool. Individual instruction in administration of preschool tests. Age range of infants through six years. Prerequisites: 535, 536a.

**537-4 Counseling Theory and Practice I.** Systematic study of the major approaches to counseling. Observation and practice utilized to supplement didactic discussion. Prerequisite: 542.

**538-4 Counseling Theory and Practice II.** Systematic study of major theories of counseling as applied to school situations. Supervised experience in role-playing or laboratory experience utilizing these approaches. Prerequisite: 537.

**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: 542.

**542-4 Basic Principles of Guidance.** Introductory course on student personnel services. Survey of philosophy, principles, and organization of guidance services. Prerequisite: 305.

**543-4 Guidance Through Groups.** Study of the methods, techniques, and materials for the organization and utilization of groups for guidance purposes. Prerequisite: 442.

**545-8 to 16 Seminar.** (a) Problems in guidance. A seminar designed to analyze current problems in guidance. 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 instructor. (f) Pupil adjustment. Analyses various concepts of adjustment and instruction. Analyses research in classroom learning and implications for the classroom. Included are practice and review, transfer of training, retention and forgetting, and motivation. Prerequisite 511. (j) Organization and administration. Analysis of principles, procedures, and plans necessary for initiating, developing, and appraising a school guidance program. Prerequisite: 537.

**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 educational practices. (a) Childhood. Prerequisite: advanced standing. (b) Adolescence. Must be taken in a,b sequence.

**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: consent of practicum coordinator.

**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. Prerequisites: advanced standing, consent of instructor.

**Economics**

- 411-4 Collective Bargaining and Dispute Settlement.**
- 416-4 Money and Banking II.** Emphasis upon the Federal Reserve System and other banking systems. Prerequisite: 300.
- 418-4 Economic History of Europe.**
- 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: 200, 201.
- 431-3 Public Finance II.** State and local. Prerequisite: 330 or consent of instructor.
- 432-3 Fiscal Policy of the United States.** Countercyclical, secular, and emergency use of government expenditures, debt, and taxes. Prerequisite: 210 or consent of instructor.
- 436-3 Government and Labor.** (Same as Government 436.) A study of labor relations and legislation considering both constitutional and economic aspects. Prerequisites: 200, 201.
- 440-4 Intermediate Micro Theory.** A more intensive treatment of price theory. Prerequisite: 201.
- 441-4 Intermediate Macro Theory.** Basic analytical concepts of the modern theory of aggregate income determination. Prerequisite: 200.
- 450-6 (3,3) History of Economic Thought.** A two-term sequence covering the development of economic theory. (a) Ancients to 1850; (b) 1850 to present. Must be taken in a,b sequence. Prerequisites: 200, 201.
- 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). Prerequisites: 440, consent of instructor.
- 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.
- 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.
- 473-4 Business Enterprise and Public Policy.** Some of the major problems of social control of business arising out of the operation of business in modern society; covers types of control, necessity, and effects of controls. Prerequisite: senior standing.
- 481-3 Comparative Economic Systems.** Capitalism, socialism, fascism, and other forms of the economy. Prerequisites: 200, 201.
- 501-1 to 5 Economic Readings.** Contemporary books and periodicals in economics. Prerequisite: consent of chairman.
- 504-4 Economic Analysis.** Determination of prices, output, payments to labor, land, and capital under a market system. Theory of economic decision-making by the business firm. Introduction to macroeconomics. Restricted to Master of Business Administration students.
- 505-4 Theory of the Firm.** Price determination under competitive conditions and under other market structures. Includes demand analysis, business forecasting, returns to factors of production, and evaluation of capital outlays. Prerequisite: 504.
- 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. Prerequisite: 310, or 411, or consent of instructor.
- 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.
- 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.

**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.

**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. Recent American policies and problems bearing on national income fluctuations. Prerequisite: 441 or consent of instructor.

**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.

**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. Prerequisites: 440 and 441 or consent of instructor.

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

**582-4 Economic Behavior.** A theoretical and empirical study of the behavioral aspects of economics, including the behavior of firms, households, and government. Draws upon the recent literature of economics and also on frontier areas, upon directly relevant concepts and findings of related behavioral sciences. Prerequisite: 400 or equivalent or consent of instructor.

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

### **Educational Administration and Supervision**

**420-4 Legal Basis of American Education.** Particular emphasis is placed on common law principles.

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

**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.

**434-4 Administrator's Workshop.** A special program for the consideration of administrative problems pertinent to superintendents, high school principals, and elementary school principals.

**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.

**480-4 Backgrounds of Urban Education.** (See also Elementary Education 480 and Secondary Education 480.) Social, economic, and demographic factors as they impinge upon programs in urban schools. Prerequisite: consent of instructor.

**490-4 to 12 International Field Studies in Comparative Education.** Selected aspects of national systems of education examined in their social matrix. By means of direct observations, conferences, lectures, and seminars, the advanced education student is helped to gain a mature perspective on American education through comparison and contrast with educational systems of other societies critically to evaluate American educational patterns in light of observed alternatives, and to develop fresh curricular approaches in the area of international understandings through an examination of other cultural patterns. With permission of instructor this course may be repeated with credit.

**500-4 Research Methods.** Introduction to educational research with practical training in research writing techniques and evaluation in education.

**501-4 Seminar in Educational Administration.** The interdisciplinary approach to the study of the theory of educational administration. Open to students in approved sixth year and doctoral programs only.

**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.

- 503-4 Seminar in Philosophy of Education.** An interpretation of modern educational problems and trends in the light of basic philosophical viewpoints. Excerpts from leading writings are used. Prerequisite: 554 or equivalent.
- 504-4 Seminar in History of European Education.** Survey and interpretation of education in Europe from the Greek era to the present. Stresses relationship of European to American education.
- 506-4 Seminar: Curriculum in Relation to American Culture.** The effect of historical movements on curriculum in our nation at all ages and grade levels continued on a more intensive basis as applied to present-day curricular patterns. Prerequisite: 460 or consent of instructor.
- 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. Prerequisite: consent of the department advisory committee.
- 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.
- 524-4 School Administration.** Designed primarily for those who look forward to positions as supervisors, principals, or superintendents.
- 525-4 Personnel Administration.**
- 533-4 School Buildings.** Various phases of physical plant design and maintenance of concern to the school administrator.
- 534a-4 School Finance.** A study of the principles and issues of Public School Finance. Revenues, expenditures, indebtedness, and fiscal controls.
- 534b-4 School Business Administration.** Principles and practices governing management of business affairs of a public school system.
- 551-4 Community Junior College Curriculum.** Expanding curricula of the community junior college. College parallel, occupational technical, general developmental, and adult and community service programs critically analyzed. Investigation of techniques of curriculum development that implement desirable program changes. Prerequisite: 565 or consent of instructor.
- 553-2 to 12 Practicum in Urban Education.** Training in professional practice and inquiry in urban classrooms. Systematic investigations of educational problems characteristic of inner city schools. Intensive supervision provided by University and school staffs. Demonstration of competence in designing and implementing research strategies, in analyzing and interpreting data, and in applying findings to teaching strategies. May complete practicum while serving as interns or as unpaid assistants. Appointments contingent upon admission to the urban education program and upon approval of the candidate by both the school and the University.
- 554-4 Contrasting Philosophies of Education.** Deals both historically and contemporaneously with the ideologies which have developed from different concepts of education. Prerequisite: 355 or Philosophy 355 or equivalent.
- 556-4 Seminar in Educational Supervision.** Special research problems in supervision for advanced graduate students.
- 560-4 Curriculum.** Modern practices and procedures in curriculum development, with attention to the professional, social, economic, and other major factors, in curriculum planning.
- 563-4 Workshop in School Public Relations.** Designed to meet the needs of teachers, supervisors, and administrators, in the area of public relations. Prerequisite: consent of instructor.
- 565-4 The Community Junior College.** Survey of the community junior college movement. History, philosophy, objectives, and expansion of this unique American educational phenomenon. Special attention given to these factors in the developing social scene that significantly influence the character of community junior colleges.
- 575-2 to 4 Individual Research.** Selection, investigation, and writing of a research assignment under the personal supervision of a graduate faculty member in one of the following areas: (a) curriculum, (b) supervision, (c) buildings, (d) finance, (e) school law, (f) comparative education; (g) history of education, (h) philosophy of education, (j) administration, (k) elementary education. Prerequisites: 500, approval of adviser, consent of instructor.
- 596-5 to 9 Independent Investigation.** Field study required of each student working for the sixth-year specialists certificate.
- 597-1 to 3, 598-1 to 3, 599-1 to 3. Thesis.** Minimum of 5 hours to be counted toward the master's degree.

## Elementary Education

**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: Counselor Education 305.

**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.

**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.

**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: 337 senior standing. Not open to students who have had 505.

**442-4 Science for the Elementary Teacher.** Study of content and methods of elementary school science.

**470-3 Workshop in Sex Education for Elementary Teachers.** (Same as Health Education 470.) Designed to encourage elementary school teachers to integrate sex education concepts into their teaching program. Current theories and knowledge concerning the psychosocial aspects of the maturation process are related to the content used for teaching pupils at various grade levels. Specialists in psychology, public health, and social welfare offer a multi-discipline approach to help teachers plan a program based upon the characteristics and needs of pupils.

**480-4 Backgrounds of Urban Education.** (See also Educational Administration 480 and Secondary Education 480.)

**505-4 Improvement of Reading Instruction.** (See Secondary Education 505.) First course in the reading sequence. Survey of reading problems, aspects of the reading process, modern practices in teaching reading.

**507-2 to 4 Readings in Reading.** Independent reading; acquaintanceship with the literature and research in reading. Conference periods. Prerequisites: 505, consent of instructor.

**509-4 to 8 Practicum in Reading.** For advanced student. Teaching demonstrations and evaluations. Each student works with a group of reading disability cases. Prerequisites: 512a,b, and c, and consent of instructor.

**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 specialists. Problems of class members are studied and discussed. Prerequisite: 561.

**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.

**518-2 to 4 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. Designed for present and prospective teachers who wish to be more effective in dealing with student teachers.

**521-12 (4,4,4,) Diagnosis and Correction of Reading Disabilities.** Causes of reading difficulties; observation and interview procedures; standardized tests, instruments, and informal inventories; analysis techniques; experiences in preparing materials for corrective purposes. Each student diagnoses and treats a reading disability case under supervision. Prerequisites: 505, or concurrent registration with 505, and teaching experience.

**541-4 Problems in Elementary School Science.** Emphasis upon identifying and planning for the solution of problems related to the science curriculum, and problems in the classroom concerning teaching and learning. Prerequisites: 441, or 442, and Educational Administration 500.

**542-4 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.

**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.

**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 area studied.

**559-4 Workshop in Instructional Leadership in Elementary Education.**

**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.

**567-12 (4,4,4) Teaching Competencies and Their Application.** Individualized and flexible group study of teaching behavior in competency centers. Skills are developed, applied, and tested in simulated or field settings.

**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.

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

**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.

## Engineering

**405-5 (4,1) Generalized Radiation.** (a) Theory of electromagnetic and mechanical radiation. Analysis of wave motion, properties of progressive waves, and boundary conditions. Examples taken from radiation in fluids and elastic media, and from electromagnetic radiation. (b) Laboratory. Prerequisite: Physics 305a,b.

**410-8 (4,4) Electron Devices.** Study of active networks utilizing transistors and tubes from both analytic and synthetic points of view. Audio, video, operational, power amplifiers; LC, RC, and relaxation oscillators; power supplies; small-signal, large-signal, switching; wave shaping; analog and digital computing circuits. Prerequisites: 200, 201, 310, concurrent enrollment in 411.

**411-2 (1,1) Electron Devices Laboratory.** Experiments illustrate the analytic material in 410 and provide experience in synthesizing active circuits. Prerequisites: 200, 201, 310, concurrent enrollment in 410.

**420-6 Transport Phenomena.** Principles and mechanism of energy, mass, and momentum transport. (a) Molecular motion, laminar flow of a continuum, and transport in solids. (b) Turbulent flow, interphase transport, radiative transfer, and macroscopic balances of mass, energy, and momentum. Laboratory projects are scheduled. Prerequisites: 300a, 311.

**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 nonlinear differential equations. Simulation as well as iterative analog computation are covered. Prerequisite: 222 or Mathematics 225.

**443-6 (3,3) Engineering Design.** Principles of engineering design. Individual laboratory projects of a research design or development nature to study systems simulation of instrumentation are selected by the student. Prerequisite: 410.

**460-8 (4,4) Engineering Analysis for Decision Making.** (a) Introduction to fundamental concepts and theorems of engineering analysis with emphasis

on the theory of linear, dynamic, and integer programming. Network analysis, inventory theory, simplex and revised simplex method, and dual theorem. Prerequisites: Mathematics 252b, 361 or consent of instructor. (b) Introduction to advanced linear programming, nonlinear, probabilistic, and stochastic programming. Prerequisites: 370, 460a, or consent of instructor.

**470-12 (4,4,4) Geodesy.** (a) Geometry of the ellipsoid; geodetic systems; geodetic curves; and computations of coordinates, distances, and azimuths. Prerequisite: Mathematics 252b. (b) Astrogeodetic methods; potential theory; Laplace and Poisson equations; spherical harmonics; and gravity potential. Prerequisite: Mathematics 305b. (c) Reductions of gravity; introduction to satellite geodesy; and world geodetic systems.

**472-3 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: Mathematics 225.

**523-3 Digital Simulation Techniques.** Review of probability, generation of pseudo-random numbers, the Monte Carlo technique, sampling, variance reduction techniques, conditional Monte Carlo, model generation, simulation of discrete systems, simulation of continuous systems, selected simulations from business, electronics, and competitive problems. Prerequisite: 472.

**524-6 (3,3) Linear and Non-Linear Programming.** Origin of linear programming problems; properties of solutions; simplex and other methods of computation; duality and its interpretation; capacitated flow problems; applications to industry. Non-linear programming; Lagrange multipliers; discrete programming. Prerequisite: bachelor's degree in mathematics, natural science, or engineering.

**525-3 Analog and Digital Methods.** A comparative study of the types of problems handled most successfully by each of the two classes of computers to facilitate intelligent decisions as to what combination of machines are required in a given situation. Prerequisite: bachelor's degree in mathematics, natural science, or engineering.

**526-3 Simulation and Data Processing.** The use of digital and analog computers as simulators of industrial processes. Construction of flow charts, fixed time increments, and time status register methods of organization. Prerequisite: 525.

**531-8 (4,4) Operations Analysis and Synthesis.** Mathematical bases for decisions and programming in industry; models, methods, and objectives of systems engineering; specific methods and problems; emphasis on practical validity and use of empirical methods. Problem solving in operations research, including research-type reports by students. Prerequisite: bachelor's degree in mathematics, natural science, or engineering.

**533-3 Program Evaluation and Review Technique.** The use of operations analysis and synthesis to obtain optimum decision making in engineering programs of design and development. Prerequisite: bachelor's degree in mathematics, natural science, or engineering.

**560-8 (4,4) Automatic Control Theory.** Principles of feedback control applied to linear, lumped parameter systems; use of Nyquist, Bode, root-locus, phase-plane analysis; stability criteria. Emphasis on systems aspects; use of theory in automated industrial processes and instrumentation.

**590-2 to 4 Readings in Engineering Mathematics.** Selected topics in applied mathematics. Emphasis upon setting up and solving differential, difference, and integral equations for problems of practical significance in engineering design and systems analysis.

## English

**400-4 Introduction to English Linguistics.** 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.

**403-4 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.

**404-12 (4,4,4) Middle English Literature.** (a) Middle English literature excluding Chaucer; (b) Chaucer: early poems and *Troilus*; (c) Chaucer: *Canterbury Tales*. May be taken separately.

- 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. May be taken singly. Prerequisite: consent of instructor.
- 412-16 (4,4,4,4) English Nondramatic Literature.** (a) 16th century, (b) 17th century, (c) The Augustan Age, 1660-1744, (d) The Age of Johnson, 1744-1798. May be taken separately.
- 420-8 (4,4) American Poetry.** (a) Trends in American poetry to 1900 with a critical analysis of the achievement of the important poets, (b) the important poets since 1900. May be taken separately.
- 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 separately.
- 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 separately.
- 438-4 Intellectual Backgrounds of American Literature.** The relationship of basic ideas in America to American literature.
- 441-4 The Eighteenth Century Essay.**
- 442-4 Romantic Prose.** Fiction of Austen Scott, Mary Shelley, Peacock, the Gothic novelists; prose of Lamb, Landor, Hazlitt, DeQuincey; criticism, journals, and letters.
- 443-4 Victorian Prose.** The chief writers of nonfictional prose from the late Romantics to 1880.
- 447-4 American Humor and Satire.** A consideration of the writers and forms of 19th and 20th century humor.
- 454-12 (4,4,4) English Fiction.** (a) 18th century: Defoe through Jane Austen, (b) Victorian novel: 1830-1880, (c) 20th century. May be taken separately.
- 456-4 Modern Continental Fiction.** Selected major works of European authors such as Mann, Silone, Camus, Kafka, Malraux, Hesse.
- 458-8 (4,4) American Fiction.** (a) The novel in America from its beginning to the early 20th century, (b) trends and techniques in the American novel and short story since 1914. May be taken separately.
- 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 separately.
- 464-4 Modern Continental Drama.** The continental drama of Europe since 1870; representative plays of Scandinavia, Russia, Germany, France, Italy, Spain, and Portugal.
- 468-4 American Drama.** The rise of the theater in America; with readings of plays, chiefly modern.
- 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 companies. May be taken separately.
- 473-4 Milton.** Reading of *Paradise Lost*, *Paradise Regained*, *Samson Agonistes*, minor poems, major treatises.
- 485-4 Problems in the Teaching of English.** Aims, methods, materials, tests, programs, and other aspects of English instruction in the high school.
- 486-2 to 8 Workshop in High School English.** Intensive study in lectures, laboratory, and conferences, on the teaching of English in high school. Curriculum, materials, methods, aims.
- 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, and aims. Directed by competent authorities in the field.
- 488-9 (3,3,3) Methods of Teaching English as a Foreign Language.**
- 492-8 (4,4) Professional Writing II.**
- 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.



- 499-2 to 6 **Readings in English.** For English majors only. Departmental approval required. No more than four hours may be taken in any one quarter.
- 500-4 **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.
- 501-4 **Old English Grammar.** The development of the forms, the grammar, and readings.
- 502-4 **Beowulf.** Readings of the poem and study of its form, language, and history. Prerequisite: 501.
- 504-4 **Advanced English Syntax.** A study of generative grammars. Prerequisite: consent of instructor.
- 505-4 **Contrastive Linguistic Structures.** A comparison of the structure of English with the structure of other languages. Prerequisite: consent of instructor.
- 508-4 to 8 **Studies in Chaucer.**
- 509-4 to 8 **Studies in Middle English Literature.**
- 511-4 to 8 **Studies in the Renaissance.**
- 513-4 to 8 **Studies in 17th Century Literature.**
- 514-4 to 8 **Studies in Restoration and 18th Century Literature.**
- 519-4 to 8 **Studies in Contemporary British Literature.**
- 520-4 to 8 **Studies in Romantic Writers.**
- 521-4 to 8 **Studies in Victorian Poetry.**
- 524-4 to 8 **Studies in the Metaphysical Poets.**
- 531-4 to 8 **Studies in American Colonial Period.**
- 532-4 to 8 **Studies in American Transcendentalism.**
- 534-4 to 8 **Studies in Early 19th Century American Writers.**
- 536-4 to 8 **Studies in Later 19th Century American Writers.**
- 537-4 to 8 **Studies in 20th Century American Writers.**
- 538-4 to 8 **Problems in American Literature.**
- 540-4 **Studies in Linguistics (Historical & Dialectal).** Characteristics of regional vocabulary and usage in the United States, and in their relationships to dialectal features of British English; synchronic and diachronic descriptions of American English. Prerequisite: consent of instructor.
- 543-4 to 8 **Studies in Victorian Nonfiction Prose.**
- 555-4 to 8 **Studies in the Victorian Novel.**
- 560-4 to 8 **Studies in Renaissance Drama.**
- 566-4 to 8 **Studies in Shakespeare.**
- 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.
- 579-16 (4,4,4,4) **Studies in Modern Literature.**
- 580-4 **Traditional Themes.** Persistent themes and legends in literature—King Arthur, Faust, Utopia, and the like.
- 581-12 (4,4,4) **Problems in High School English.** (a) Composition. (b) Linguistics. (c) Literature.
- 585-2 to 8 **Teaching College Composition.** Objectives, methods, and materials for the course; observation; and practice under supervision.
- 597-2 to 4 **Readings in Linguistics.** Individual readings in linguistics under the guidance of a staff member.
- 598-1 to 9 **Independent Review of English and American Literature.** Restricted to master's degree students.
- 599-2 to 9 **Thesis.**

### Finance

- 420-4 **Problems in Corporation Finance.** Application of principles of finance to specific cases. Development of analytical ability and fuller comprehension of the nature of financial problems as encountered in business and industry by combining specific cases and collateral readings. Prerequisite: 320.
- 423-4 **Commercial Banking Operations.** The administration and operation of a commercial bank, including organization structure and asset management. Major problems are analyzed through study of cases. Prerequisite: 420.
- 424-4 **Financial Institutions.** A study of the evolution, functions, and practices of the many types of financial intermediaries especially which have come

into prominence since World War II. Particular attention is given to commerce and investments. Prerequisite: 420.

**425-4 Investments.** A survey of the investment field in theory and practice. Study of the state and federal agencies concerned with regulation of the issuance and exchange of securities in the interest of the investing public. The analysis of the particular types of investment securities and the bases for investment decisions and the management of investment portfolios. Prerequisite: 420.

**430-4 Business Finance.** An introductory course combining both a description of the structure of business financing and an analysis of functional finance from a managerial viewpoint.

**520-4 Finance.** Basic aspects of business finance. Sources of capital, short- and long-term financial planning and policy-making, the impact of the banking systems and of money or capital markets on business finance. Restricted to Master of Business Administration students.

**523-4 Financial Management.** Deepens understanding of financial concepts and practices through analysis of case problems in the major areas affecting the financial management of business. Prerequisite: 520.

**528-4 Seminar in Finance.** Intensive study and research in a problem in management of business according to the student's particular interests. Prerequisite: 523.

## Foreign Languages

### *General Foreign Language*

**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.

**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 laboratory, and applied linguistics. Required for all majors intending to teach foreign languages. Prerequisite: one quarter of any 300-level course or consent of instructor.

### FRENCH

**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.

**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 or consent of instructor.

**500-2 Seminar in Contemporary French Literature.** A study of the *nouveau roman* and anti-theater from 1950 to the present.

**501-2 to 6 Seminar on a Selected French Author.** Intensive study of one author. May be taken a maximum of 3 times.

**507-3 A Study of Romanticism.** Prerequisite: graduate standing in Romance language.

**510-4 19th Century Realism.** A study of the Parnassian school of poetry, of realism and its ultimate development into naturalism in the drama and novel. Prerequisite: graduate standing in Romance language.

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

**544-4 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.

**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: bachelor's degree with emphasis in foreign languages.

**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, textbooks, testing, organization of foreign language courses on various levels. Prerequisite: bachelor's degree with emphasis in foreign languages.

#### GERMAN

**401-4 Faust.** Analysis of both parts of Goethe's masterpiece, its background, meaning, and impact on world literature together with a general survey of the life and times of the author. Prerequisites: 201, one quarter of 220.

**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. Prerequisite: senior standing in German language.

**413-3 German Linguistics.** Introduction to Comparative German Linguistics tracing relationships among German languages on the basis of phonology, morphology, and syntax. Prerequisite: senior standing in German language.

**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.

**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.

**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.

**506-2 Romanticism I.** Study of the forerunners of German Romanticism: Holderlin, Jean Paul; and the authors of Early Romanticism: the writers of the so-called "Berlin School," with special attention to their involvement and reaction to 18th century thought. Lectures, reports.

**507-2 Romanticism II.** Study of Patriotic Romanticism: Kleist, Arndt, Korner, Uhland, etc., and Late Romanticism: Eichendorff, Lenau, Grillparzer, Heine, Morike, etc. Lectures, reports.

**509-4 (2,2) Old High German.** (a) Phonology, morphology, etymology, and syntax. (b) Continued study of grammar and reading of Franconian, Bavarian, and Alemannic texts. Prerequisite: graduate standing in German language.

**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.

**513-3 Twentieth Century German Novel.** Continuation of 512. Study of representative writers of expressionism, "Neue Sachlichkeit," etc. Lectures, reports.

#### SPANISH

**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.

**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.

**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.

**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.

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

**520-3 Seminar in Syntax.** Stylistics and grammatical analysis.

**525-3 The Spanish Ballads.** The romance studied as a part of the literature and folklore of Spain and the New World.

**535-3 Mexican Essayists of the 19th Century.** Currents of Mexican thought in the 19th century.

#### 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 students with concentration in these fields. Prerequisite: senior standing in Romance language.

#### Geography

**402-10 (4,3,3) 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 is 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 of instructor.

**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 of instructor.

**404-10 (4,3,3) 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 is 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 of instructor.

**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 of instructor.

**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 is 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.

**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 of instructor.

**410-8 (4,4) Quantitative Methods in Geography.** (Same as Government 410.) Statistical and computer research techniques for geographers.

**416-8 (4,4) Cartography.** Instruction and practice in the techniques of map-making and problems in map reproduction. Laboratory. Prerequisite: 310.

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

**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.

**426-12 (4,4,4) Photogrammetry.**

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

**461-7 (4,3) Advanced Regional Geography: Anglo-American.** 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.

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

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

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

- 465-7 (4,3) **Advanced Regional Geography: Africa.** See 461.
- 466-7 (4,3) **Advanced Regional Geography: Asia.** See 461.
- 467-7 (4,3) **Advanced Regional Geography: Latin America.** See 461.
- 468-7 (4,3) **Advanced Regional Geography: Oceania.** See 461.
- 470-16 to 20 (4,4,4,4 to 8) **Urban Planning.** (See Sociology 470c) (a) Planning concepts and methods. (b) Planning administration and the planning function in public process. (c) Field problems. (e) Planning and public administration internship.
- 471-8 (4,4) **Regional Planning.** Area and regional development, theory, and practices.
- 475-4 to 8 **Methods of Field Geography.** Application of geographic field techniques.
- 490-8 (1 to 2, 8 total) **Tutorial in Geography.** Individual and small group conferences with staff members to examine geographic concepts. Prerequisite: Institute status.
- 500-4 **Geographic Techniques I.** Emphasizes field and quantitative techniques used in geography.
- 501-4 **Geographic Techniques II.** Emphasizes the conceptual framework of geography, library and bibliographic techniques, and geographic writing.
- 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.
- 515-4 to 6 **Field Course.** Actual experience in the field. Under guidance of staff members students gather data and work toward the solution of selected field problems in one particular region of the world. Not offered on campus, but in a field camp location suited to the study of selected problems. Prerequisites: 500, 501.
- 520-2 to 8 **Seminar in Physical Geography.**
- 521-2 to 8 **Seminar in Economic Geography.**
- 522-2 to 12 **Seminar in Regional Geography.**
- 523-4 **Seminar in Cartography.**
- 524-2 to 8 **Seminar in Cultural Geography.**
- 527-2 to 8 **Seminar in Urban and Regional Planning.**
- 530-2 to 10 **Independent Studies in Geography.**
- 599-2 to 9 **Thesis.** Minimum of 5 hours to be counted toward a master's degree.

### Government

- 410-8 (4,4) **Quantitative Methods in Political Science** (Same as Geography 410). Statistical and computer research techniques for political scientists.
- 421-4 **Public Personnel Administration.** Analysis of problems of recruiting, retaining, and developing public service employees and related topics such as political neutrality, motivation, security, and manpower planning. Prerequisite: 320.
- 422-4 **Public Financial Administration.** Survey of problems encountered in the administration of public financial resources including budgeting, accounting, auditing, and fiscal and monetary policy. Prerequisite: 320.
- 423-4 **Comparative Public Administration.** Introduction to administrative organization and practices of Western and non-Western nation-states. Prerequisite: 320.
- 424-4 **Administrative Law.** Principles of administrative law in the United States with special emphasis on the law of public officers and on legal procedures for the enforcement of bureaucratic responsibility. Prerequisite: 320.
- 429-4 **Topics in Public Administration.** Intensive study of an administrative problem or process. Intended primarily for government concentrations with advanced standing. Prerequisite: 320.
- 445-12 (4,4,4) **American Political Behavior.** (a) Survey of studies of American elections emphasizing the psychological, sociological, and political-legal bases of voting behavior. (b) Survey of research findings concerning the relationship of psychological and sociological characteristics to the political process. (c) Survey of research findings concerning the relationship of communications content and communications media to the political process. Prerequisite: 203a.
- 449-4 **Topics in American Politics.** Intensive examination of one significant facet of the American political system. Primarily for government concentrations having had considerable work in the area. Prerequisite: GSB 203a.

**456-4 Topics in Comparative Politics.** Detailed study of a major question of relevance to comparative politics. For students with considerable background in government course work. Prerequisite: 350 or 355.

**472-8 (4,4) International Organizations.** (a) Description and analysis of both past and contemporary general international organizations, with special emphasis on the principles, structure, decision-making processes, operations, and problems of the United Nations and its related agencies. (b) Examination and comparative analysis of the foundations, nature, and functioning of contemporary regional organizations, their relationship to the United Nations system, and their role in world politics. Attention focused on such bodies as NATO, the Warsaw Pact, the OAS, SEATO, the Commonwealth, the Arab League, the Organization for African Unity, the European Communities, Comecon, and Lafta. Prerequisite: 200.

**473-12 (4,4,4) Foreign Politics of Major Powers.** (a) Institutional framework and decision-making processes of American Foreign policy; idealist and realist schools of thought; the national interest in historic and geographic perspective. (b) Analysis of objective strategy, and tactics of Soviet foreign policy, with emphasis on the combination of conventional and unconventional instruments including role of Communist parties. (c) Analysis of foreign policies of the major European powers, with emphasis on structural changes incident to the two world wars and the dissolution of colonial empires. Prerequisite: 370.

**479-4 Topics in International Relations.** Detailed study of a selected topic in the area of international relations. Primarily for government concentrations with advanced standing. Prerequisite: 370.

**481-8 (4,4) Descriptive Political Theory.** (a) Intensive study of major contemporary attempts to devise a general systems theory of politics. (b) The character of scientific inquiry as it relates to the discipline of political science. Prerequisite: 200.

**484-12 (4,4,4) History of Western Political Theories.** Examination of theories in the history of Western political thought. (a) Emphasis on the theories of Plato, Aristotle, the early and middle Stoa, Cicero, Augustine, and Aquinas. (b) Emphasis on the theories of Machiavelli, Bodin, Hobbes, Licko, Montesquieu, Rousseau, Burke, and Bentham. (c) Emphasis on the theories of Publius, Hegel, Comte, Mill, Marx, Green, Kropotkin, Sorel, the Fabians, and John Dewey. Prerequisite: 385.

**486-3 Workshop on Teaching the American Political Heritage.** Major concepts and topics of the American political heritage including myth, symbol, signal, natural rights, limited government, libertarianism, totalitarianism, and socialism; and methodological tools which aid communication of those topics to elementary and secondary school students in a palatable and comprehensive form.

**487-6 (3,3) American Political Theory.** Examination of leading American political thinkers. The concepts and topics of political thought in the United States are examined in relation to both the political milieu of their given periods as well as the manner in which they contributed to a developing policy. (a) From Puritan thought to Alexis de Tocqueville. (b) From Calhoun to the present. Prerequisite: 385.

**489-4 Topics in Political Theory.** Examination of the works of one major political thinker and the treatment of one major topic or idea by selected political thinkers. Primarily for students concentrating in government with advanced standing. Prerequisite: 385.

**495-12 (4,4,4) Constitutional Law.** (a) A study of the development of American constitutional law chiefly through judicial opinion. Emphasis is placed on the analysis of federalism and the distribution of powers. (b) A study of government power and the rights of property. Special attention is directed to tension between the public welfare and private rights, the extent of government power to regulate property rights, and state versus federal power over commerce and taxation. (c) A study of the nature and extent of civil rights and liberties in the United States. Special attention is given to freedom of speech, press, and association, separation of church and state, equal protection of the laws, and the rights of persons accused of crime. Prerequisite: 210 or equivalent.

**496-4 American Judicial Behavior.** Introduction to the methods, goals, and limitations of behavioral research on American courts and judges. The impact of technology on the judicial process. Prerequisite: 340c.

**499-4 Scope and Method of Political Science.** Introduction to major schools

of thought and basic research techniques in political science. Prerequisites: 200, 20 hours in courses numbered above 399.

**521-1 to 12 Readings in Government.** Supervised readings in selected subjects. Not more than 6 hours may apply toward the master's degree. Prerequisite: consent of instructor.

**529-2 to 9 Seminar in Public Administration.** Prerequisite: consent of instructor.

**545-2 to 9 Seminar in American Politics.** Prerequisite: consent of instructor.

**555-2 to 9 Seminar in Comparative Politics.** Prerequisite: consent of instructor.

**575-2 to 9 Seminar in International Relations.** Prerequisite: consent of instructor.

**585-2 to 9 Seminar in Political Theory.** Prerequisite: consent of instructor.

**590-2 to 9 Seminar in American Public Law.** Prerequisite: consent of instructor.

**599-2 to 9 Thesis.**

### 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.

**415s-3 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 are treated. Lectures by safety authorities, demonstrations, field trips, audio-visual materials, and individually supervised research in special problem areas. Prerequisite: 302 or equivalent.

**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.

**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.

**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, demonstration, films, field trips, and individually supervised research in special problems. Prerequisite: 100 or its equivalent.

**470-3 Workshop in Sex Education for Elementary Teachers.** (Same as Elementary Education 470.)

**471-4 Organization and Administration of School Health.** Appraisal of overall 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.

**480s-3 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: 313 or 323 or consent of instructor.

**525s-4 Organization, Administration, and Supervision of Safety Education.** Designed to give the student basic principles of organization, administration, and supervision of safety education. Problems, policies practices, and methods involved in the organization and administration of a safety education program.

### Higher Education

**551-4 Curriculum Design and Policy.** Study of assumptions, materials, methods, and evaluation in the designs of various curricula in colleges and universities, with attention to curriculum resources and policy.

## History

- 401-4 History of the South.** An intensive study of the social, economic, political, and cultural developments of the South.
- 405-3 The American Civil War.** Emphasis upon the clash of national and sectional interests; economic, political, and military aspects of the conflict. Prerequisite: GSB 300b or consent of instructor.
- 410-2 to 5 Special Readings in History.** Supervised readings for students with sufficient background. Registration by special permission only. Offered on demand.
- 412-9 (3,3,3) Intellectual History of the United States.** (a) 17th and 18th centuries. (b) 19th century. (c) 20th century. Prerequisite: GSB 300.
- 415-12 (4,4,4) Early Modern Europe.** (a) Renaissance. (b) The Reformation. (c) Age of Absolutism and Enlightenment. Prerequisite: GSB 101b,c.
- 417-16 (4,4,4,4) Advanced English History.** (a) The Empire-Commonwealth. (b) Constitutional History. (c) English Culture in the Age of the American Revolution. (d) Tudor England.
- 420-4 The French Revolution.** A sketch of the passing of feudalism in France, the background and development of the revolutionary movement, and the Napoleonic period.
- 425-6 (3,3) American Colonial History.** (a) Discovery and Settlement, (b) British Imperial Structure.
- 426-4 The Revolution and the Constitution.** A study of the conflicting forces which produced the American Revolution, led to the creation of the federal union, and shaped the early republic.
- 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 are considered in detail. Prerequisite: GSB 300a.
- 430-9 (3,3,3) Late Modern Europe.** (a) Age of Revolution, 1815-1880. (b) 1880-1918. (c) Since 1918. Age of Dictatorships.
- 435-12 (3,3,3,3) Advanced American History.** (a) 1865-1895. (b) 1896-1919. (c) 1919-1939. (d) 1940-present.
- 440-9 (3,3,3) History of American Diplomacy.** (a) To 1913. (b) 1913 to 1945. (c) Recent problems in diplomacy. Prerequisite: GSB 300a,b,c.
- 451-3 Historiography.** Development of history as a written subject, including works and philosophy of the various historians in ancient, medieval, and modern periods.
- 452-3 Historical Research and Thesis Writing.** The rules of historical research studied and applied to a definite topic. For history majors only.
- 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 United States history.
- 458-8 (4,4) History of Science.** (a) Survey of Ancient and Medieval science with emphasis on Greek science and scientific developments of the late Middle Ages. (b) Survey of science from 1500 to 1900 with emphasis on "Scientific Revolution." Prerequisites: GSB 101b,c.
- 460-9 (3,3,3) Social and Intellectual History of the Middle Ages.** (a) 500-1000. (b) 1000-1250. (c) 1250-1500.
- 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.
- 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.
- 473-6 (3,3) The Caribbean Area.** (a) Island states of the Caribbean. (b) Central American area.
- 474-3 United States-Mexican Relations.** A chronological and topical study of the diplomatic, economic, military, and cultural relations between the two nations.
- 500-3 to 9 History Seminar.** (a) American history, (b) European history, (c) Latin American history.
- 510-2 to 5 Readings in History.** Registration by special permission only.
- 511-3 Studies in the Middle Ages.** Extensive reading and discussion in selected topics of medieval European history.



**512-3 Studies in Nineteenth Century Europe.** An advanced readings course in selected problems of nineteenth century Europe. Emphasis on economics, social, and intellectual history. Prerequisite: History 430a,b or consent of instructor.

**513-4 Problems in Ancient History.** For graduate students who have had one or more undergraduate courses in ancient history. Consists primarily in analyzing and discussing selected source material in translation.

**514-3 Studies in Asian History.** Pro-seminar course on select topics in Asian History. Prerequisite: consent of faculty.

**515-3 Current United States History and Problems.** A content and research course dealing with contemporary American affairs. Consists of textbook assignments and outside readings. Prerequisite: proper background and consent of instructor.

**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.

**530-4 City-States of the Italian Renaissance.** An intensive study of selected city-states in Italy during the period from the late 13th century to the end of the 15th century. The political and economic developments, and the "culture" of the Italian Renaissance.

**534-4 Eighteenth-Century England.** Introductory lectures and discussion of aspects of 18th century English political, constitutional, economic, and social history.

**540-4 American Reform Movements.** The dynamics of American reform movements, their similarities and differences, their triumphs and failures, and the spirit which motivates them and distinguishes them from attempts to change the direction of other societies. Includes both lectures and discussion based on books pertinent to each reform era. Prerequisite: U.S. survey.

**553-3 New Viewpoints in American History.** New interpretations and recent developments in American history. Prerequisite: GSB 300.

**554-4 Problems in 19th Century America.** Lectures, discussions, and readings on significant issues and interpretations of 19th century America.

**575-9 (3,3,3) Studies in Latin American History.** A content and research course concerning selected studies in Latin American history.

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

### 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.

**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.

**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.

**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.

**407-4 Basic Reference Sources.** Evaluation, selection, and the use of reference sources for elementary and secondary school libraries. Principles and methods of reference service.

**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.

**413-4 Cataloging of Non-Book Materials.** The classification, cataloging preparation and circulation of all types of non-book material such as films, filmstrips, slides, realia, etc. Prerequisite: 308.

**417-4 Audio-Visual 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.

**420-4 School Library Activities and Practice.** Supervised practice and observa-

tion integrated with instruction in the typical activities of school librarianship; storytelling, publicity, developing units of library instruction, and work with students. Prerequisites: 308, 403, 405, or 406 and 407.

**422-4 Book Selection.** Principles for selection and evaluation; use of standard selection aids, reviews, and annotations; policies governing the building and maintenance of a collection.

**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.

**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.

**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.

**458-4 The Medium of the Motion Picture.** A study of the full range of expression by motion pictures including documentary, theatrical, educational, experimental, and industrial films. Representative films are screened.

**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.

**510-4 Mass Communications in Education.** The use of mass media in the classroom. Includes radio, TV, comic books, newspapers, magazines, motion pictures.

**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.

**530-4 History of Books and Libraries.** The evolution of the printed book and the rise and development of modern libraries.

**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. Structured for both the audio-visual administrator and the class room teacher. The principles and practices of integrating audio-visual materials into the curriculum; the problems, annotations, and classification of evaluated materials. Prerequisites: 417, consent of instructor.

**547-4 School Film and Filmstrip Production.** Simplified techniques for teachers and audio-visual coordinators who may need to produce school-made films and filmstrips to meet local school problems. Prerequisites: 417 and 440 or consent of instructor.

**548-4 Supervision and Administration of an Audio-Visual Program.** Provides professional information and training for persons with administrative responsibilities at the district or unit level. Primarily designed for directors of Instructional Materials and Audio-Visual Centers. Prerequisite: 417 or consent of instructor.

**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.

**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. Designed to further the training of specialists in the supervision and administration of integrated audio-visual and library programs. Prerequisite: 403.

**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 depend on background and interest of individuals. Prerequisite: consent of instructor.

## Management

**475-4 Budgeting and Systems.** Budgeting and system as aids in coordinating and directing business operation. Prerequisites: 320, Accounting 251c.

### Management Operating Systems

**580-4 Management Systems.** Design and usage of comprehensive, computer-based systems for managerial decision-making and control. A basic understanding of a computer programming language is included. Restricted to Master of Business Administration students.

**583-4 Advanced Management Systems.** Development of ability to think clearly about management systems. Learning to view simultaneously the overall business organization as a system, and the sub-systems of information-flow which are elements of the business system. Bridging of the gap between the ideal management system and the operational, practical, real-world business systems with its variety of sub-systems a basis for drawing conclusions, formulating alternative courses of action, and making decisions. Prerequisites: 580, Quantitative Methods 510, 511.

**588-4 Seminar in Management Systems.** Broadens and deepens understanding of the application of management science to business. Brings together computer-supported quantitative methods and considers ways of making these tools available for business decisions. Problems are taken from such areas as distribution, production, inventory, finance, budgeting, managerial accounting, and personnel. Prerequisites: 583, Quantitative Methods 513.

### Marketing

**452-4 Physical Distribution Management.** Spatial relationships of plant capacity and storage facilities and their connecting link, transportation. Prerequisite: 341 or graduate standing.

**470-4 Marketing Research.** A development of the concepts necessary for understanding and performing research in the area of marketing. The basic procedures and theories underlying research are investigated, evaluated, and applied to marketing decision making. Such areas as market, advertising, and sales research are given consideration. Prerequisites: 371, Quantitative Methods 211.

**471-4 Advertising Policy and Management.** Advertising strategy, planning, research and its relationship to other marketing tools. Emphasis is placed on problems faced by marketing and business executives in administering the advertising effort. Prerequisite: 470.

**472-4 Sales Policy and Management.** Content centers around the organization and operation functions of salesmen and sales managers (including all echelons from the general marketing managers to the territory sales men.) Problem areas such as sales department organization, recruiting salesmen, motivating and supervising salesmen, sales territory design and coverage, and appraising salesmen's performance are included in the content of the course. Prerequisite: 470.

**473-4 Advanced Marketing Management.** An advanced course in managerial marketing which is designed as a capstone course for marketing majors. The purpose is to develop the student's ability to identify marketing problems, investigate alternative solutions, and render decisions. Prerequisite: senior standing. This course should be the final course taken by the undergraduate marketing major.

**570-4 Marketing Concepts.** An introductory course designed to explore the place of marketing in individual businesses and in the economy. Emphasis on marketing functions, institutions, and current thought. Prerequisite: Master of Business Administration students only.

**573-4 Marketing Policies.** Primary emphasis on managerial aspects of the marketing function, including product, research, promotion, pricing, and channel strategies. Relationships to other business functions, to the legal environment, and to information technology as used by marketing managers. Quantitative methods of decision-making as applied to marketing. Prerequisite: 570.

**578-4 Seminar in Marketing.** Through the study of selected cases and other methods, the student explores and analyzes current marketing problems and contemporary developments in marketing practices and appraises and evaluates the significance of these developments. Prerequisite: 573.

## 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 changes in the concept of rigor in the development of mathematics from 600 B.C. Prerequisite: 150b.

**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 nonparametric statistics; (c) design of experiments; (d) sample survey techniques. May not be used to satisfy requirements for a mathematics concentration. 3 lectures and 2 laboratory hours per week. Must be taken in either a,b,c,d or a,b,d,c sequence. Prerequisite: GSD 114a.

**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.

**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.

**420-6 (3,3) Fundamental Concepts of Algebra.** Introduces abstract algebraic structures including groups, rings, fields, and vector spaces. Must be taken in a,b sequence. Prerequisite: 321.

**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: 321.

**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: 252b.

**426-6 (3,3) Mathematical Logic.** (Same as Philosophy 426.) (a) Martix 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: 420a or consent of instructor.

**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: 321 or consent of instructor.

**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 6 credits in courses numbered 300 or higher, or consent of instructor.

**440-2 to 4<sup>1</sup> Modern Algebra for Teachers.** An introduction to algebra as a logical system, including groups, rings, and fields. Prerequisite: consent of instructor.

**442-2 to 4<sup>1</sup> Survey of Geometry.** A survey of geometry, including projective geometry, topology, etc. Prerequisite: consent of instructor.

**445-2 to 4<sup>1</sup> 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.

**446-2 to 10 Structure of Mathematics.** A course to assist experienced teachers in extending their understanding of mathematics. (a) Elementary School

<sup>1</sup> These courses are open to candidates for the Master of Science in Education 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.

Mathematics; (b) Junior High School Mathematics. Does not count credit toward a mathematics concentration. Prerequisites: experience in teaching, consent of instructor.

**447-4 The Structure of Secondary School Mathematics.** A course to assist experienced secondary school teachers in extending their understanding of mathematics. Does not count toward a mathematics concentration. Prerequisites: experience in secondary teaching, consent of instructor.

**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.

**455-9 (3,3,3) Advanced Mathematics for the Physical Sciences.** Introduction to various topics such as complex variable theory with applications, operational calculus (Laplace and other transforms), vector field theory, and partial differential equations. May be taken separately or in any sequence. Prerequisite to (a): 225b; to (b) or (c): 305a.

**458-6 (3,3) Finite Mathematics.** An introduction to topics in finite mathematics such as logic, sets, probability, linear algebra, and Markov chains. Designed for students preparing for high school teaching and for advanced students in the behavioral sciences. Prerequisite: 252a or consent of instructor.

**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.

**472-9 (3,3,3) Computer Science.** An introduction to computing systems and the mathematics of computation. (a) Computer organization, design, and programming systems. (b) Linear system problems, linear programming and network problems. (c) Digital simulation problems, linear and other probabilistic problems. Prerequisites: 225, 305a, 321.

**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. Prerequisites: 305a or 252b and consent of instructor.

**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.

**483-9 (3,3,3) Introduction to Mathematical Statistics.** A mathematical development of the elements of statistical theory. (a) Probability distributions, generating functions, and limit theorems. (b) Statistical inference; estimation, tests of hypotheses, general linear hypotheses. (c) Design of experiments and special topics—a mathematical model approach. Must be taken in a,b,c sequence. Prerequisite: 252b.

**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.

**505-9 (3,3,3) Theory of Ordinary Differential Equations.** Existence and uniqueness theorems; general properties of solutions; linear systems; geometric theory of non-linear equations; stability and control theory; self-adjoint boundary problems; oscillation theorems. Must be taken in a,b,c sequence. Prerequisites: 321, 452.

**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.

**520-9 (3,3,3) 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 function spaces; rational numbers and fields, complex numbers, unique factorization, algebraic number fields. Must be taken in a,b,c sequence. Prerequisite: 420.

**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. Must be taken in a,b,c sequence. Prerequisite: 433 or 501b.

**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.

**540-4<sup>1</sup> 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.

**545-4<sup>1</sup> 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. Topics include sequences, series, limits, real continuous functions, integrable functions on a closed interval. Prerequisite: consent of instructor.

**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.

**551-9 (3,3,3) Functional Analysis.** The theory of linear transformations between infinitely dimensional topological vector spaces, including Banach and Hilbert spaces, with various applications. The basic notion for the study is that of a functional or continuous scalar-valued linear transformation. Must be taken in a,b,c sequence. Prerequisites: 421, 452.

**555-9 (3,3,3) Complex Variables.** Classical and modern analytic function theory, including Cauchy-Riemann equations, Cauchy-Goursat theorem, conformal mapping, normal families, Riemann mapping theorem, calculus of residues, analytic continuation, Riemann surfaces, entire functions. Must be taken in a,b,c sequence. Prerequisite: 452c.

**575-9 (3,3,3) Advanced Topics in Numerical Analysis.** Selected topics, such as numerical solution of ordinary and partial differential equations, the algebraic eigen-value problem, matrix iterative analysis, error propagation for difference methods, rounding errors in algebraic processes, and algorithms. Prerequisites: 421, 455.

**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  $\mathbb{R}$ , foundations of probability, random variables and distributions in  $\mathbb{R}$ , sampling distributions, tests of hypotheses, theory of estimation. Must be taken in a,b,c sequence. Prerequisite: 452, 455.

**595-1 to 10 Special Project.** An individual project, including a written report. (a) Algebra; (b) Geometry; (c) Analysis; (d) Probability and Statistics; (e) Mathematics Education.

**599-1 to 9 Thesis.** Minimum of 5 hours to be counted toward the Master of Arts degree.

## Music

**401-3 Psycho-Physiology of Music.** The essential human capacities, their

<sup>1</sup> These courses are open to candidates for the Master of Science in Education 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.

relationship to musical potentials and development as well as with the acoustical foundations of the world of music.

**411-9 (3,3,3) Music Literature.** (a) Symphonic: A study of the development of the symphony and the symphonic poem. (b) Choral: The literature of the larger vocal forms such as the cantata and oratorio. (c) Chamber Music: Study of chamber music from the Renaissance to the present.

**414-2 to 6 Collegium Musicum.** Practicum in the preparation and performance of music from early times to the classical period. Prerequisite: music major and/or consent of faculty.

**420-1 Music Education Practicum.** A shop-laboratory course dealing with the selection, adjustments, maintenance, and repair of musical instruments.

**440-2 to 4 Private Applied Music.**

- a. Violin
- b. Viola
- c. Violoncello
- d. String Bass
- e. Flute
- f. Oboe
- g. Clarinet
- h. Bassoon
- i. Saxophone
- j. Percussion
- k. Piano

- l. French Horn
- m. Trumpet
- n. Trombone
- o. Tuba
- p. Baritone
- q. Voice
- r. Organ
- s. Harpischord
- t. Harp
- u. Classical Guitar

Applied music for graduate credit is offered at the 400 and 500 levels in the areas listed above. Credit is given at 2 to 4 hours per quarter on each level. May be repeated each quarter of graduate study. Students with concentrations in performance usually take 4 hours per quarter at the 500 level; concentrations in music education and all secondary concentrations usually take 2 hours at the 400 level. Prerequisite for 440 and 540: audition or consent of instructor.

**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.

**451-3 Teaching of General Classroom Music.**

**453-4 to 6 Workshop in Common Learnings in Music.** Emphasizes commonality of learning concepts and philosophies of music education as evidenced by Dalcroze, Suzuki, Orff, Kodaly, and others. Intensive work in each of these areas and in-depth laboratory experiences. Recognized authorities in each of these areas serve as consultants.

**455-2 to 6 Elementary Music Education Workshop.**

**461-6 (3,3) Teaching Techniques and Materials for the Beginning and Intermediate Levels.** Designed to meet the needs of applied students in which the problems of private studio teaching and college level teaching are discussed.

**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.

**481-2 to 6 Readings in Music Theory.**

**482-2 to 6 Readings in Music History and Literature.**

**483-2 to 6 Readings in Music Education.**

**499-1 to 3 Independent Study.** The capable student engages in original investigations with faculty specialists. May be repeated for credit. Prerequisite: consent of instructor.

**501-3 Introduction to Graduate Study in Music.** Basic bibliographical and historical research techniques in music theory, literature, and education.

**502-9 (3,3,3) History and Analysis of Musical Style.** Analysis of representative works chosen from the Baroque, Classical, Romantic, and Modern eras.

**515-3 Twentieth Century Literature.** Survey of the life and works of Beethoven; emphasis upon the evaluation of his musical styles through analysis of representative works.

**518-3 Pedagogy of Music Literature.** Principles of teaching music literature and music appreciation courses at the college level.

**519-9 (3,3,3) Vocal Pedagogy and Literature.** (a) A study of vocal pedagogy with emphasis on the techniques and materials to be used with beginning voice students. (b) Advanced vocal pedagogy with related study of the history of singing and of the teaching of singing. (c) A survey of literature for solo voice and its relation to vocal pedagogy.

- 520-3 American Music.** The development of music in America from colonial days to present.
- 522-3 Seminar: Music History and Literature.** Advanced study in special periods of music history-literature.
- 535-3 Contemporary Idioms.** Techniques of composition developed during the 20th century by composers of Europe and America.
- 540-2 to 4 Private Applied Music.** (See 440.)
- 550-8 (4,4) Organization and Administration of the Music Education Program.**
- 553-6 (3,3) Seminar in Materials and Techniques.**
- 556-3 Advanced Conducting.** Problems in score reading and interpretation. Laboratory conducting of larger ensembles.
- 560-2 to 6 Seminar in Music Education.** Trends, current practices, philosophies of music education.
- 566-1 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.
- 567-1 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.
- 599-3 to 9 Thesis.**

### Personnel and Industrial Relations

- 450-4 Personnel Administration.** The functions of the personnel department in an organization; organization for personnel administration; factors affecting the efficiency of personnel; the managerial responsibility for effective personnel administration; personnel practices including recruitment, orientation, evaluation, transfer, promotion, dismissal, grievances, the personnel-centered approach contrasted to the task-centered approach. Case discussion and reports on selected topics assist in developing the varied responsibilities of the personnel function. Prerequisite: General Business Administration 340.
- 451-4 Labor Relations Law and Collective Bargaining.** An analysis of labor relations legislation and the complex interrelations of management, employees, and labor unions, as well as of collective bargaining contracts, their scope, enforceability, and significance to labor relations. Cases and reports are incorporated. Prerequisite: General Business Administration 340.
- 452-4 Advanced Problems in Personnel Administration.** Analysis of special problems of personnel administration in periods of rapid technological change. Case problems and reports are used to emphasize such pertinent areas as wage and salary administration, automation, unemployment, training, productivity, and the administration of technical and scientific personnel. Prerequisite: 450.
- 453-4 Advanced Problems in Industrial Relations.** Exploration and development of labor, management, and government relations. A study of conflict and harmony between them as individual units and as a totality. Emphasis is placed on the internal grievance procedure and the roles of the National Labor Relations Board, Federal Mediation and Conciliation Service, arbitrators, and other tripartite bodies in industrial relations. Cases and reports are incorporated. Prerequisite: 451.

### Philosophy

- 430-4 Symbolic Logic.** Use of symbols as tools for analysis and deduction. Study of truth tables, Boolean expansions, propositional calculus and quantifiers, logic of relations, and their functions in logic systems.
- 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.
- 484-12 (4,4,4) History of Western Political Theory.** (a) Ancient and Medieval. (b) Renaissance and Early Modern. (c) Recent. Any part may be taken alone.
- 490-2 to 12 Special Problems.** Seminar for qualified seniors and graduate students to pursue specific topics in depth. Varied content. Prerequisite: consent of instructor.



**495-2 to 12 Independent Readings.** Independent study in philosophy on a tutorial basis. Prerequisite: consent of instructor and chairman.

### Physical Education

**402-4 Organization and Administration of Intramural and Extramural Activities.** Planning intramural programs of sports; planning and coordinating extramural activities commonly associated with physical education.

**404-2 Workshop in Dance for In-Service Teachers.** History of dance, values of dance, interpretation of music for dance, teaching techniques and facilities, and fundamental dance movements leading to knowledge and command of dance skills.

**420-4 Physiological Effects of Motor Activity.** The general physiological effects of motor activity upon the structure and function of body organs; specific effect of exercise on the muscular system.

**427-4 Physical Education and Recreation for the Handicapped.** Characteristics of handicapped children as they affect the feasibility of physical education and recreation activities. Values of specific activities for certain types of children, and methods and materials for teaching physical education and recreation skills. Emphasis on activities suitable to classroom, home, and institution. Prerequisite: Counselor Education 305.

**475-2 to 4 Individual Research.** The selection, investigation, and writing of a research paper under the supervision of instructor.

**476-2 to 4 Teaching Athletic Skills.** Modern techniques of teaching skills, conditioning, and strategies; for prospective physical education teachers and coaches.

**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.

**501-4 Curriculum in Physical Education.** Principles and procedures for curriculum construction and revision; criteria for selecting activities and judging outcomes and the place of the physical education course of study within the total curriculum.

**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.

**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.

**504-4 Problems in Physical Education.** Planning, conducting, and reporting original research studies. Prerequisite: consent of instructor.

**509-4 Supervision of Health and 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.

**525-4 Readings in Physical Education.** Supervised reading in selected subjects. Open only to last quarter seniors and graduate students. Prerequisite: consent of instructor and faculty chairman.

### Physics

**404-3 Introduction to Statistical Mechanics.** A brief treatment of the kinetic theory of gases; introduction to phase spaces and ensemble theory. Shows the connection between mechanical and thermodynamic concepts. Obtains a statistical interpretation of thermodynamic processes. Prerequisite: 301, 304 or consent of instructor.

**415-12 (4,4,4) Modern Physics.** Elements of wave mechanics, atomic and nuclear physics, fundamental particles, and relativity. Must be taken in a,b,c sequence. Prerequisites: 300, 9 hours of mathematics numbered 300 or above.

**418-1 to 4 Modern Physics Laboratory.** Advanced laboratory work with pulsed and continuous lasers and optical detectors, nuclear magnetic resonance, nuclear spectroscopy, vacuum techniques, mass and beta spectroscopy, and semiconductor physics.

- 420-2 to 5 Special Projects.** Each student is assigned to a definite investigative topic. Adapted to advanced undergraduate students. Prerequisites: 301, 305.
- 435-3 Plasma Physics.** Basic equations and conservation laws; first order orbit theory with applications to static and dynamic problems; small amplitude plasma waves; hydromagnetic shocks; collision effects; diffusion across a magnetic field; stability; coupling of plasmas and radiation. Prerequisite: 305.
- 445-8 (4,4) X-Ray Crystallography.** (a) Symmetry elements, development of space groups, reciprocal space, geometrical theory of diffraction, determination of lattice parameters, Fourier representations of periodic structure. (b) Production of x-rays, kinematical theory of x-ray diffraction, diffraction techniques, factors affecting the intensity of reflections, extinction contrast methods, introduction to the dynamical theory. Must be taken in a,b sequence. Prerequisite: 300.
- 450-3 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, 415a; 304 or consent of instructor.
- 510-9 (3,3,3) Classical Mechanics.** Variational principles and Lagrange's equations; rigid body motion; special relativity; canonical equations, small oscillations including non-linear problems; perturbation methods; classical theory of fields. Prerequisite: 301.
- 530-9 (3,3,3) Electromagnetic Theory.** Maxwell's Formalism of classical electromagnetism, application of electrostatics, magnetostatics, electrodynamics, and radiation problems. Prerequisite: 305.
- 531-9 (3,3,3) Quantum Mechanics.** Wave mechanics, matrix mechanics, transformation theory of quantum mechanics; angular momentum, perturbation theory, scattering theory. Prerequisites: 415, Mathematics 407 or consent of instructor.
- 540-3 Nuclear Physics.** General nuclear properties, two body problems, nuclear forces, discussion of various models, reactions, and radioactive decay. Prerequisite: 415.
- 560-3 Statistical Mechanics.** Classical statistical mechanics, ensemble theory, quantum statistical mechanics with applications. Prerequisites: 404, 415.
- 570-3 Solid State Physics.** Basic theory of the solid state including diamagnetism, ferromagnetism, paramagnetism, band theory, semiconductor theory, and superconductivity. Prerequisites: 415a,b, 450.
- 575-1 to 4 Graduate Seminar.** Lectures on special topics to be given when a demand arises. Prerequisite: consent of instructor.
- 580-3 to 6 Selected Topics in Physics.** Topics of special interest. Prerequisite: consent of instructor.
- 590-1 to 9 Research in Physics (Thesis).** 1-5 hours each quarter. Prerequisite: consent of faculty.

## Production

- 460-4 Production Management.** Analysis of the basic functions of manufacturing films. Student's work on a project of their choice in conjunction with lectures and class discussions. Blueprint reading, equipment and tools, plant layout, product flow, materials handling, quality control, cost control, production control, methods engineering, product engineering, inventory control, the use of PERT, and financial concepts as related to production management. Several plant visits. Prerequisite: General Business Administration 340.
- 461-4 Methods Design and Work Measurement.** Design of work systems, methods, and techniques employed in the measurement of work. Emphasizes current philosophy underlying improvement of work methods and procedures used to measure work performed. Covers four major areas: methods design, standardizing the operation, work measurement, and training the operator. A number of projects correlating with the course material are assigned. Prerequisite: 460.
- 462-4 Production Planning and Control.** Analyzes and describes the recurrent problems of managing the flow of materials, services, and information pro-

duced in response to changes in market demand. Emphasizes the top-level decisions necessary to plan and control operations so that customers are served on time and penalty costs are minimized, as well as the decisions made by middle and first line managers in regard to scheduling and controlling, purchasing, production, and distribution. Selected decision-making techniques are analyzed and evaluated from the production manager's point of view. Prerequisite: 460.

**463-4 Advanced Production Management.** Examines the operating decisions that confront the managerial and supervisory production personnel of large, medium, and small scale manufacturing firms using a variety of production processes. Emphasizes decision-making leading to the solution of production operating problems, and to the formulation of plans of action. Assigned cases provide a view of the types of decisions involved in planning, organizing, coordinating, integrating, and controlling resources so that production goals may be realized. Prerequisites: 460, 461, 462.

## 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 are considered. Prerequisite: 312 or consent of instructor.

**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: 311 or consent of instructor.

**407-4 Theories of Learning.** A consideration of the major contemporary learning theories and their relation to experimental data. Prerequisite: 406 or consent of instructor.

**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: 313 or consent of instructor.

**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.

**420-4 Experimental Analysis of Behavior.** Examination of the principles of respondent and operant conditioning in human and animal behavior. Lecture and laboratory. Prerequisite: 201c.

**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, includes the use of selected instruments. Lecture and laboratory. Prerequisite: 211b, consent of instructor.

**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.

**432-4 Mental Hygiene.**

**440-4 Theories of Personality.** A review and critical evaluation of major personality theories and their supporting evidence. Prerequisite: 305 or consent of instructor.

**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.

**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.

**465-4 Group Dynamics and Individual Behavior.** 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.

**471-4 Work Methods and Measurement.** Analysis and evaluation of jobs and

the measurement of work performances by the use of standard time tables. Prerequisite: 320 or consent of instructor.

**473-4 Personnel Psychology.** Psychological methods in selection, placement, evaluation, and criterion development. Emphasis on principles and techniques with some examples of application in decision-making in business and industry. Prerequisite: 320 or consent of instructor.

**474-4 Psychology of Employee Relations.** A study of job satisfaction and morale, psychological aspects of labor relations, industrial counseling, interviewing methods, human relations, and social and organizational variables as they affect psychological climate in employee relations. Prerequisite: 320 or consent of instructor.

**479-4 Psychology of Industrial Conflict.** Consideration of social and psychological factors underlying controversies between workers and management. Prerequisite: 320 or consent of instructor.

**490-1 to 8 Independent Projects.** Independent readings and projects in psychology. Prerequisite: consent of instructor and chairman.

**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 chairman.

**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) Personality and individual differences, new conceptual and methodological developments and trends. Must be taken in a,b,c sequence. Prerequisite: consent of instructor. Open to students in other areas by consent of chairman.

**512-4 Sensory Processes.** A study of the structure and functions of the sense organs. Emphasis on the psychological data which describe the function of these organs. Lecture and laboratory. Prerequisite: consent of instructor.

**514-8 (4,4) Physiological Psychology.** Study of neural and endocrine mechanisms underlying behavioral processes. Lecture and laboratory. Prerequisite: 314 or consent of instructor.

**520-4 Research Design and Inference I.** Study of elements of probability, design, and analysis of simple experiments including t and F tests; selected non-parametric tests and multiple regression analysis. Prerequisite: 211b or Counselor Education 420.

**521-4 Research Design and Inference II.** Design and analysis of factorial experiments including analysis of variance models, analysis of covariance, and of Latin square design. Prerequisite: 520.

**522-4 Research Design and Inference III.** Advanced design and analysis of psychological experiments. Analysis of variance in complex designs, analysis of covariance, and trend analysis. Prerequisite: 521.

**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.

**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. Prerequisites: 530, 541, 541b, consent of instructor.

**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: consent of instructor.

**541-6 to 8 (4, 2 to 4) Psychodiagnostics I.** Introduction to clinical psychology with attention to the function and clinical use of individual intelligence tests. Theories of intelligence and related research. Age scales with emphasis on infant and child testing. Point scales and tests of deterioration with emphasis on child and adult testing. Lecture and practicum. Prerequisites: 520, consent of instructor.

**543-8 (4,4) 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: 541 or consent of instructor.

**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.

**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.

**561-4 Social Influence Processes.** Critical review of theoretical and empirical developments in the study of influence processes, attitude change, etc. Social and intrapersonal determinants are examined. Prerequisite: 461 or consent of instructor.

**564-4 Communication and Group Behavior.** Emphasis 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.

**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.

**590-1 to 16 Readings in Psychology.** Readings in selected topics in psychology under staff supervision. Prerequisite: consent of chairman.

**591-1 to 36 Research in Psychology.** Research under staff supervision in selected areas of psychology. Prerequisite: consent of chairman.

**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, (s) School Psychology.

**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.

**599-1 to 9 Thesis.**

### Quantitative Methods

**510-4 Statistical Analysis for Decision-Making.** Statistical techniques applicable to business including distributions of one variable, index numbers, time series, multivariate distributions. Introduction to probability, sampling, estimation with confidence intervals, tests of hypotheses, regression, and correlation. Restricted to Master of Business Administration students.

**511-4 Quantitative Methods for Decision-Making.** Modern mathematical techniques applicable to business problems. Set theory, finite mathematics, and calculus. Restricted to Master of Business Administration students.

**513-4 Deterministic Models in Decision-Making.** Matrix algebra, classical optimization techniques, linear problems, and model building. Prerequisites: 510, 511.

**518-4 Seminar in Probabilistic Models.** Application of modern mathematical theory to the solution of business models under conditions of uncertainty. Includes statistical inference, inventory models, queuing, and game theory. Analytical and simulation techniques are employed. Prerequisite: 513.

### Rehabilitation

**480-2 Introduction to Rehabilitation.** A survey of the philosophy, procedures and practices underlying the rehabilitation movement, including the history and legislation that have contributed to its rapid development.

**511-2 to 4 Vocational Developments and Occupational Choice.** The psychosocial meaning of work, vocational development and theory of occupational choice, and the analysis of the labor market now and in the future. Prerequisite: consent of instructor.

**519-2 Selection, Placement, and Follow-up.** A survey of current methods and criteria used in job development, selective placement, and follow-up of handicapped and deprived individuals. Prerequisite: consent of instructor.

**531-2 Vocational Appraisal.** Consideration of tests and procedures used in assessing the individual's functioning abilities and the meaning work has in achieving fulfillment, which also includes the requirements of the job for purposes of aligning the two. Prerequisite: 511 or consent of instructor.

**541-2 Medical Aspects of Rehabilitation.** A review of human systems, disfunctions leading to major diseases entities and injuries, and the implications for rehabilitation. Prerequisite: consent of instructor.

**561-2 Psycho-Social Aspects of Disability.** An examination of the socio-emotional impact of traumatic injury or chronic illness (on human functioning) and its role in the rehabilitation process. Prerequisites: 421, consent of instructor.

**580-1 to 6 Practicum in Rehabilitation Services.** Familiarization with the functions of various rehabilitation settings through observation and participation in those activities—usually one day per week. Prerequisite: consent of instructor.

**585-1 to 16 Practicum in Rehabilitation Counseling.** Practice in developing counseling skills under close supervision in a variety of settings.

**589-0 to 12 Internship in Rehabilitation.** Full-time practice in a rehabilitation setting supervised by both agency personnel and university faculty. Prerequisites: 585, consent of department.

### Science and Technology

**400-3 Concepts of Classical Physics.** Classical physics from a phenomenological point of view and at a level which does not require a previous course in the calculus. Primarily for teachers of the physical sciences; subject matter is related to texts and materials available in the teachers' own schools.

**402-4 Modern Physics.** The development of physics in this century. For teachers of the physical sciences. Emphasis on the phenomena which led to the formulation of quantum theory in the twenties. A qualitative discussion of atomic and nuclear physics. Prerequisite: 400 or Physics 206.

**403-6 (3,3) Experiments and Techniques of Physics.** Conducting of experiments and consideration of equipment for teaching physics at the pre-college level. Lectures on experimental techniques.

**415-1 to 3 Instructional Innovation for the Physical Sciences.** A variety of subject matter with regard to its order of presentation in a course, the type of plausibility arguments most successful in a "derivation," the types of demonstrations most appropriate to the subject matter, and the relation of laboratory work to the lecture content.

### Secondary Education

**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.

**440-3 to 4 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: Counselor Education 305.

**480-4 Backgrounds of Urban Education.** (See also Educational Administration and Supervision 480 and Elementary Education 480.)

**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.

**488-4 Teaching Social Studies in Secondary Schools.** Objectives, scope, and sequence of curriculum; methods of teaching different courses and age groups; materials; and evaluation. Prerequisite: Counselor Education 305.

**505-4 Improvement of Reading Instruction.** (See Elementary Education 505.)

**507-2 to 4 Readings in Reading.** Independent reading; acquaintanceship with the literature and research in reading. Conference periods. Prerequisites: 505, consent of instructor.

**508-4 Seminar: Trends in Selected Areas in Secondary Schools.** For students

in advanced graduate work. Individual class members 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, consent of the instructor.

**509-4 to 8 Practicum in Reading.** For advanced students; teaching demonstrations and evaluations. Each student works with a group of reading disability cases. Prerequisites: 521a,b,c and consent of instructor.

**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. Prerequisites: Educational Administration 505, 561.

**518-2 to 4 Supervision of Student Teachers.**

**521-12 (4,4,4) Diagnosis and Correction of Reading Disabilities.** Causes of reading difficulties; observation and interview procedures; standardized tests, instruments, and informal inventories; analysis techniques; experiences in preparing materials for corrective purposes. Each student diagnoses and treats a reading disability case under supervision. Prerequisites: 440 or 505 or concurrent registration with 505, and teaching experience.

**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 cooperative planning of units of work. Critical study of current practices in this field. Prerequisite: Educational Administration 460.

**562-4 The 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 domestic. The instructor serves as a coordinator of activity; resource people are used freely. Prerequisite: one other graduate course in curriculum.

**564-4 High School Principalship.** 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. Prerequisites: Educational Administration 424, consent of instructor.

**567-12 (4,4,4) Teaching Competencies and Their Application.** Individualized and flexible group study of teaching behavior in competency centers. Skills are developed, applied, and tested in simulated or field settings.

**570-4 Extra-Class Activities.** Cocurricular activities of the junior and senior high school including intramural and interscholastic functions.

**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) Higher Education, (j) Junior College.

**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.

**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 cooperation is extended. The study involves selecting of the problem, survey of pertinent literature, recording of results, and appropriate interpretations and summarizations.

**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.

## Social Welfare

**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: 375 or consent of instructor.

**482-4 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.

## Sociology

**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: consent of instructor.

**406-4 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: GSB 201b or 301.

**412-4 Sociological Research.** Application of the scientific method to sociological problems. The role of theory. Principles of good research design, measurement, sampling and analysis. Prerequisite: graduate status or consent of instructor.

**424-4 Collective Behavior.** The behavior of people in large groups; collective interstimulation and emotions; crowds, audiences, and publics; mass stimuli and mass response. Prerequisite: 321 or 322, or consent of instructor.

**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, or consent of instructor.

**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.

**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 or 301.

**438-4 Sociology of Occupations.** 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 or 301.

**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: consent of instructor.

**451-4 Social Thought II: The Sociological Movement.** From Romanticism to Realism; rise and development of scientific social thought. Prerequisite: consent of instructor.

**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: GSB 201b or 301.

**470c-4 Urban Planning.** (See Geography 470c.)

**472-4 Treatment and Prevention of Crime.** A survey of the correctional field covering probation, institutional treatment, and parole: their historic development, organizational structure, program content, and current problems. Prerequisite: 372 or consent of instructor.

**483-3 Current Problems in Corrections.** An exploration of contemporary problems in the control and treatment of sentenced offenders and a review of research trends in corrections. Prerequisites: 472, consent of instructor.

**484-4 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, consent of instructor.

**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 are delineated with special reference to the public school



administration, counselor, the social workers, the court, probation officers, and police. Prerequisite: consent of instructor.

**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.

**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 casework components of the process. Prerequisite: 481 or consent of instructor.

**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.

**504-4 Seminar in American Sociology.** A survey of development of American sociology from its beginnings in the late 19th century to the present. Prerequisite: 501 or consent of instructor.

**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 is 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.

**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.

**521-4 Seminar in Social Psychology.** Survey of theoretical systems; progress toward integrated body of behavioral theory. Prerequisite: 426.

**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.

**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. Prerequisites: 15 hours of sociology, consent of instructor.

**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.

**596-2 to 12 Readings in Sociology.** Supervised readings in selected subjects. Prerequisite: consent of instructor and chairman of faculty.

**599-2 to 9 Thesis.** Prerequisite: consent of chairman.

### Special Education

**410a-4 Problems and Characteristics of the Emotionally Disturbed Child.** Diagnosis, screening, classroom management, placement considerations, goals, and the effective use of ancillary services. Emphasis on the understanding of maladaptive behavior through principles of learning and behavior dynamics. Prerequisite: Psychology 301 or 303, or consent of instructor.

**410b-4 Problems and Characteristics of the Mentally Retarded Child.** Educationally significant characteristics including cognitive, emotional, and sociological considerations. Problems of definition, screening, diagnosis, classification systems, and classroom management are considered. Prerequisite: Counselor Education 305 or 414.

**410c-4 Problems and Characteristics of the Gifted Child.** Designed to help teachers in the identification of and programming for gifted and talented children. Prerequisite: Psychology 301 or 303 or consent of instructor.

**413a-4 Directed Observation of Emotionally Disturbed Children.** Student observation and participation in group and individual work with emotionally disturbed children. Often taken concurrently with 410a. Prerequisite: consent of instructor.

**413b-4 Directed Observation of the Educable Mentally Handicapped.** Student observation and participation in group and individual work with mentally

retarded children. Often taken concurrently with 410b. Prerequisite: consent of instructor.

**413c-4 Directed Observation of the Gifted.** Student observation and participation in group and individual work with gifted children. Often taken concurrently with 410c. Prerequisite: consent of instructor.

**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. Prerequisite: Psychology 301 or 303 or consent of instructor.

**420a-4 Methods and Materials in the Education of the Emotionally Disturbed.** Offered in conjunction with practice teaching. Methods and materials needed in teaching emotionally disturbed children in special education programs. Prerequisites: 410a, consent of instructor.

**420b-4 Methods and Materials in the Education of the Educable Mentally Handicapped.** Usually offered in conjunction with practice teaching. Methods and materials needed in teaching educable mentally retarded in special education programs. Prerequisites: 410b, consent of instructor.

**420c-4 Methods and Materials in the Education of the Gifted.** Offered in conjunction with practice teaching. Methods and materials needed in teaching gifted children. Prerequisite: 410c.

**427-4 Physical Education and Recreation for the Handicapped.** (See Physical Education 427.)

**428-4 Speech Correction for the Classroom Teacher.** (Same as Speech Pathology and Audiology 428.)

**481a-4 Seminar: Emotionally Disturbed.** Focuses on classroom management, dynamics of behavior, and behavior modification through a systematic learning theory approach. Prerequisites: 410a, consent of instructor.

**481b-4 Seminar: Educable Mentally Handicapped.** Emphasizes special problems of the retarded, issues in curriculum planning, and implementation and techniques for establishing effective school-home and school-community relations as they apply to retarded children. Prerequisites: 410b, consent of instructor.

**481c-4 Seminar: Gifted.** Considers issues such as special courses, regular class placement of the gifted, curriculum provisions, identification and guidance of the gifted. Prerequisites: 410c, consent of instructor.

**496-1 to 8 Readings and Independent Study in Special Education.** Study of a highly specific problem area in the education of exceptional children. Open only to selected seniors and graduate students. Prerequisites: 414, consent of staff.

**501-4 Special Research Problem.** For majors and minors in the field 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.

**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, cooperating agencies, and legal aspects of the problem. Prerequisite: 414.

**517-4 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.

**518-4 to 8 Workshop in Special Education.** Designed to promote better understanding of the psychological and educational problems of atypical children. Specialists used as consultants. Open to graduate students majoring in education, counselor education, or special education. Prerequisite: 414.

**570-2 Seminar: Vocational Guidance of the Handicapped.**

**571-2 Special Problems of the Handicapped I.**

**572-2 Special Problems of the Handicapped II.**

**577-4 to 12 Practicum in Special Education.** Supervised experience in school or institution programs for atypical children. Special research project. Open to graduate students only. Prerequisites: 410a or b or consent of staff.

**580-8 (4,4) Seminar: Education of Exceptional Children.**

**590-12 (4,4,4) Seminar: Mental Retardation.** Critical review of administrative practices, research, theories and etiological factors relevant to programs in the

education of children who are mentally retarded or gifted. Implications of research in related disciplines. Application of theories to practice. Open to advanced graduate students in special education only. Prerequisite: consent of instructor.

### Speech

**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.

**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 America history. A lecture, reading, and discussion course. Parts may be taken independently.

**408-4 Psychology of Speech.** Nature and development of speech, its basic psychology, and the part speech plays in personality development.

**449-4 General Semantics.** Means of changing implications so that language, in spoken or written form, describes the life facts.

### Speech Pathology and Audiology

**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 2 hours of clinical activity or work on clinically related projects for each hour of credit. 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 12 hours total credit in this course. Need not be taken in sequence, but a,b, or c cannot be repeated. Prerequisite: junior standing in department.

**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. Prerequisite: 416 or consent of instructor.

**412-4 Cerebral Palsy.** An investigation of the etiology, problems, and therapy of cerebral palsy. Prerequisites: 212, 414 or consent of instructor.

**414-4 Anatomy and Physiology of Speech and Hearing Mechanisms.**

**415-4 Aphasia.** An investigation of the etiology, problems, and therapy of aphasia. Prerequisite: 412, 414 or consent of instructor.

**419-4 Communication Problems of the Deaf and Hard of Hearing.** Objectives and techniques for the teaching of lip reading, speech conservation, and auditory training. Prerequisite: 406 or consent of instructor.

**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.

### Theater

**400-0 to 18 (0,2,4, or 6 per quarter) Theater 400.** Seminar-studio. Main stage repertory theater assignment. Prerequisites: 100, 200, 300.

**402-8 (4,4) Play Directing.** (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, and control of tempo and mood, styles of presentation and performance, and other techniques in the direction of plays.

**404-2 Workshop in Dance for In-Service Teachers.** (See Physical Education 404.) History of dance, values of dance, interpretation of music for dance, teaching techniques and facilities, and fundamental dance movements leading to knowledge and command of dance skills.

**410-3 Children's Theater.** Creative dramatics; dramatization of children's literature; play production for elementary schools. Recommended for education concentrations.

**438-4 Contemporary Developments in Theater.** Critical study of theory and practice in acting, directing, production, and architecture in the modern theater. The development of the film, radio, and television as dramatic media.

# 4 / Faculty

## **Business Division**

### *Accounting*

*Associate Professors* Donald P. Bedel, James Eaton, Irvin Jarett (*Chairman*),  
Richard J. Milles, Joe R. Small.  
*Assistant Professor* Burton J. Nissing.

### *Business Education*

*Professors* Mary Margaret Brady (*Chairman*), Wilmer O. Maedke.  
*Associate Professors* Gene L. Houser, Elise D. Palmer, Patricia Patsloff.  
*Assistant Professor* Wayne Eirich.

### *Economics*

*Professors* Leo Cohen, Louis S. Drake, Howard S. Dye (*Chairman*)  
*Associate Professors* Rasool M. H. Hashimi, Michael Keran, David C. Luan,  
Ann S. Schwier.  
*Assistant Professor* An-Yhi Lin.

### *General Business Administration*

*Professors* Walter Blackledge, Homer L. Cox, John J. Glynn, Arthur Hoover  
(*Chairman*), Kenneth Myers, Ralston D. Scott.  
*Associate Professors* S. Kumar Jain, Don A. Livingston, John V. Meador,  
Stanley L. Sokolik.

### *Management Science*

*Associate Professors* Robert S. Hoeke (*Chairman*), Boulton B. Miller.  
*Assistant Professor* Paul Tarpey.

### *Marketing*

*Professors* Howard S. Dye (*Acting Chairman*), James M. Gwin.  
*Assistant Professor* Warren A. DeBord.  
*Instructor* Daniel B. Bosse.

## **Education Division**

### *Counselor Education*

*Professors* Howard V. Davis, Cameron W. Meredith, Daniel W. Soper.  
*Associate Professors* Thomas W. Hansmeier, John J. McBride (*Chairman*),  
William Mermis, Dean E. Rochester, Raymond E. Troyer.  
*Assistant Professor* James J. Pancrazio.  
*Visiting Professor* Helen Ederle.

### *Educational Administration*

*Professors* George C. Ackerlund, Robert G. Andree, H. Bruce Brubaker, Leonard B. Wheat, W. Deane Wiley (*Chairman*).  
*Associate Professors* Merrill Harmin, George T. Wilkins.

*Health, Recreation, and Physical Education*

Associate Professor Zadia C. Herrold (*Chairman*).

Assistant Professors Rosemarie Archangel, Walter C. Klein, Norman E. Showers.

*Instructional Materials*

Professor Boyd Mitchell.

Associate Professor Eldon H. Madison (*Chairman*).

Assistant Professor Vykuntapathi Thota.

*Psychology and Psychological Services*

Professors Alfred E. Kuenzli, H. Dene Southwood, Lawrence E. Taliana.

Associate Professors Erwin H. Brinkmann (*Chairman*), Robert O. Engbretson,

Eva D. Ferguson, Virginia N. Harris, John N. McCall, Frank B. McMahan,

J. Robert Russo, Kathryn K. Skinner, Fay H. Starr, Richard P. Walsh.

Assistant Professors Robert A. Daugherty, Bernard J. Hartman, Robert J. McLaughlin.

*Special Education and Rehabilitation*

Professor Mark M. Tucker.

Associate Professor Orval G. Johnson (*Chairman*)

Assistant Professor V. Faye Shaffer.

*Teacher Education and Curriculum*

Professors David E. Bear, Ralph W. Ruffner, Herbert F. A. Smith, Francis T. Villemain (*Chairman*), G. K. Dale Wantling.

Associate Professors Gordon C. Bliss, Henry T. Boss, Regan Carpenter, George

H. Goodwin, S. Joseph Gore, Olin Hileman, Ruth W. Richardson, John H.

Schnabel, Myllan Smyers, Leslie J. Wehling.

Assistant Professors James M. Comer, A. Dudley Curry, Donald Darnell,

Arthur E. Jordan, Donald C. Madson, Roy S. Steinbrook, Richard Swerdlin.

Lecturer David C. Hofmann.

Visiting Professor Charles A. Lee.

**Fine Arts Division***Art and Design*

Professor Harry H. Hilberry (*Chairman*).

Associate Professors Evelyn T. Buddemeyer, William F. Freund, David C.

Huntley, Leon Jacobson, Catherine E. Milovich, John A. Richardson.

Assistant Professors Nancy B. Altvater, John W. Cannon, Jr., Don F. Davis,

Lawrence L. Marcell, Michael J. Smith.

*Music*

Professors Lloyd G. Blakely (*Chairman*), Warren A. Joseph, John D. Kendall, Dale Moore, Ruth Slenczynska, Edwin B. Warren.

Associate Professors Assen Kresteff, Dorothy E. Tulloss, Leonard VanCamp.

Assistant Professors Clinton Fjerstad, George K. Mellott, Robert Oberlag, Kent Perry, Renato Premezzi, Robert Schieber, William H. Tarwater.

*Speech and Theater*

Professors Andrew J. Kochman, Keith R. St. Onge, Hollis L. White (*Chairman*).

Associate Professors Robert B. Hawkins, Lynn F. Kluth, James L. Robinson, Richard L. Stope, William W. Vilhauer.

Assistant Professors Stephen M. Archer, Leslie Branham, Alcine Wiltz.

**Humanities Division***English Language and Literature*

*Research Professor* John F. McDermott.

*Professors* James C. Austin, James M. Brown, Robert Duncan, Ellen Frogner, William T. Going, Nicholas Joost, Marion A. Taylor, Wayland B. VanSyoc, Gordon R. Wood.

*Associate Professors* John I. Ades (*Chairman*), Dale S. Bailey, Gertrude Drake, A. Edwin Graham, Stella Revard, William C. Slattery, Jules Zanger.

*Assistant Professors* Herman A. Dreifke, Daniel F. Havens, Gladys R. Steinman.

*Foreign Languages and Literature*

*Professors* Helen D. Goode, Paul F. Guenther, Alfred G. Pellegrino (*Chairman*), Raymond J. Spahn.

*Philosophical Studies*

*Professors* George W. Linden (*Chairman*), Gerald J. T. Runkle.

*Associate Professors* William John Emblom, Ronald J. Glossop, Norman D. Livergood.

*Assistant Professors* John Barker, Charles Corr.

**Library**

*Associate Professors* John C. Abbott, John Dustin.

**Department of Nursing**

*Professor* Harriet Smith Reeves.

*Associate Professors* Mable Grumley Burton, Maxine J. Chambers, Lucille H. McClelland, Lydia Ricci, Mary Steck.

**Science and Technology Division***Biological Sciences and Technology*

*Associate Professors* Ralph W. Axtell, Harold E. Broadbooks, Marion L. Kumler, Donal G. Myer, Jamie E. Thomerson, Gertraude C. Wittig.

*Assistant Professors* Justin N. Frost, Richard D. Keating, Michael Levy, Nancy R. Parker, Richard R. Parker (*Chairman*), Kermit O. Ratzlaff.

*Visiting Professor* Peter Savostin.

*Chemistry*

*Associate Professors* Marinus P. Bardolph, Ferdinand H. Firsching, William J. Hufker, Emil F. Jason, Irwin H. Parrill, William J. Probst, David G. Rands, J. Edmund White (*Chairman*).

*Assistant Professors* Ralph Lee Bain, Henry D. Drew, Antony Wilbraham.

*Engineering*

*Professors* Julius Brown (*Chairman*), Leonard Jones.

*Associate Professors* George Arnold, Myron C. Bishop.

*Mathematical Studies*

*Professors* Kermit G. Clemans, Andrew O. Lindstrum, Jr., Robert N. Pendergrass (*Chairman*), Eric A. Sturley.

*Associate Professors* William C. Bennewitz, Arthur O. Garder, Orville Goering, Richard E. Hughs, Clellie C. Oursler, Robert B. Rutledge, III.

*Assistant Professors* Florence A. Fanning, Ray C. Gwilliam, Jimmie Ray Hattemer, Lyman S. Holden, Irving J. Kessler, Paul H. Phillips, George V. Poynor, Gregory Stephen.

### *Physics*

*Professors* Mohamed A. Hakeem, Laurence R. McAneny, William C. Shaw.  
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*Assistant Professor* Steven G. Sanders (*Chairman*).  
*Instructor* Frederick Zurheide.

## **Social Sciences Division**

### *Behavioral Sciences*

*Professors* Paul J. Campisi (*Chairman*), Donald L. Taylor, Fred W. Voget.  
*Associate Professors* Robert Blaine, Robert B. Campbell, Ernest L. Schusky, Jack B. Thomas.  
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### *Earth Sciences*

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### *Government and Public Affairs*

*Professors* Kurt Glaser, Daniel S. McHargue, John S. Rendleman.  
*Associate Professors* John W. Ellsworth (*Chairman*), James R. Kerr, S. D. Lovell, George R. Mace, Arthur A. Stahnke.  
*Assistant Professor* Georg Maier.

### *Historical Studies*

*Professors* Earl S. Beard, Patrick W. Riddleberger, Herbert Rosenthal.  
*Associate Professors* Michael C. Astour, Robert F. Erickson (*Chairman*), John G. Gallaher, Stanley B. Kimball, Allan J. McCurry.  
*Assistant Professors* James M. Haas, Richard L. Millett, Samuel C. Pearson, Jr., Ronald A. Steckling, Stuart L. Weiss.

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