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1964-1966 Southern Illinois University Bulletin Carbondale Campus (College of Liberal Arts and Sciences)

Southern Illinois University Carbondale

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Southern Illinois University

Bulletin



College of Liberal Arts and Sciences

CARBONDALE CAMPUS 1964-66

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.

College of Liberal Arts and Sciences

Announcements for 1964-1966



SOUTHERN ILLINOIS UNIVERSITY BULLETIN
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General Information
General Studies and AF ROTC
Financial Assistance
Summer Session (Carbondale)
Summer Session (Edwardsville)
Schedule of Classes (Carbondale)
Schedule of Classes (Edwardsville)
Divisional Announcements (Edwardsville)
Graduate School
College of Education
College of Liberal Arts and Sciences
School of Agriculture
School of Business
School of Communications
School of Fine Arts
School of Home Economics
School of Technology
Division of Technical and Adult Education
Department of Nursing

All intending students should have the General Information bulletin (issued once a year), plus the special bulletins of the various educational units in which they are most interested.

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This Bulletin

covers in detail questions concerning the College of Liberal Arts and Sciences. It does not cover all questions concerning Southern Illinois University. For complete information about the University, please refer to the General Information bulletin.

This issue supersedes Volume 3, Number 11.

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University Calendar, 1965-1966

SUMMER QUARTER, 1965

Quarter Begins	Monday, June 21
Independence Day Holiday	Monday, July 5
Final Examinations	Monday–Saturday, August 23–28
Commencement (Edwardsville)	Saturday, August 28
Commencement (Carbondale)	Sunday, August 29

FALL QUARTER, 1965

New Student Week	Sunday–Tuesday, September 19–21
Quarter Begins	Wednesday, September 22
Thanksgiving Vacation	Wednesday, 12 Noon–Monday, 8 A.M. November 24–29
Final Examinations	Monday–Saturday, December 13–18

WINTER QUARTER, 1966

Quarter Begins	Monday, January 3
Final Examinations	Monday–Saturday, March 14–19

SPRING QUARTER, 1966

Quarter Begins	Wednesday, March 23
Memorial Day Holiday	Monday, May 30
Final Examinations	Thursday–Wednesday, June 2–8
Commencement (Edwardsville)	Thursday, June 9
Commencement (Carbondale)	Friday, June 10

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

University Calendar, 1966-1967

SUMMER QUARTER, 1966

Quarter Begins	Monday, June 13
Independence Day Holiday	Monday, July 4
Final Examinations	Monday–Saturday, August 22–27
Commencement (Carbondale)	Saturday, August 27
Commencement (Edwardsville)	Sunday, August 28

FALL QUARTER, 1966

New Student Week	Sunday–Tuesday, September 18–20
Quarter Begins	Wednesday, September 21
Thanksgiving Vacation	Wednesday, 12 Noon–Monday, 8 A.M. November 23–28
Final Examinations	Monday–Saturday, December 12–17

WINTER QUARTER, 1967

Quarter Begins	Monday, January 2
Final Examinations	Monday–Saturday, March 13–18

SPRING QUARTER, 1967

Quarter Begins	Wednesday, March 22
Memorial Day Holiday	Tuesday, May 30
Final Examinations	Thursday–Wednesday, June 1–7
Commencement (Carbondale)	Thursday, June 8
Commencement (Edwardsville)	Friday, June 9

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

Images of Eternity
BENZIGER
SOUTHERN ILLINOIS UNIVERSITY PRESS

COCHITI
A NEW MEXICO PUEBLO - PAST AND PRESENT
CHARLES H. LANGE
SOUTHERN ILLINOIS UNIVERSITY PRESS

CAMINOS DE MEXICO
MAVIS

LEWIS
MAINTAINING FISHES
ABZ

CHERRY
EARLY ENGLISH LIBERALISM
BOOKMAN

MARRIAGE
BY HERMAN R. LANTZ & ELOISE C. SNYDER
WILEY

APPELLTON CENTRAL COURTS

Functional Anatomy of the Feeding Apparatus
in Waterfowl (Aves: Anseridae)

Doctors in Blue
Adams

Lorraine Durrell
Southern Illinois University Press

Principles of Law
MORTON

WOMAN SUFFRAGE IN MEXICO
MORTON

Terms in Their Psychological Contexts
in Wittgenstein's Tractatus: An Index

COUNTY GOVERNMENT IN ILLINOIS

ROBERT FISHER
ZOOLOGY

THE INTELLIGENT HEART BY HAPPY I. McPHERSON

A FLOW OF
SOUTHERN ILLINOIS

College of Liberal Arts and Sciences

SOUTHERN ILLINOIS UNIVERSITY was established in 1869 as Southern Illinois Normal University. The shortened name became official in 1947 by action of the state legislature. The University now operates two major campuses, located at Carbondale and Edwardsville.

The College of Liberal Arts and Sciences was established in 1943, with sixteen departments. The college has continued to strengthen its program until at the present time its departments number seventeen in addition to several special study areas.

OBJECTIVES

The College of Liberal Arts and Sciences provides for specialized education in the fields of instruction covered by its departments. The college also is a service instructional unit for other colleges, schools, and institutes contributing both to the specialized and general education of their students.

A liberal arts education attempts to develop individuals with minds which are capable of seeking and evaluating; which are adaptable and independent.

FACILITIES

Owing to its geological history and location, the Southern Illinois area is richly endowed floristically and faunistically, so that the area is outstanding for studies in the biological and earth sciences. A group of three

greenhouses, a headhouse, and a herbarium of about 30,000 specimens are added special facilities for the biological sciences.

The antiquity of the land and its early occupancy by people make the area an excellent place for the study of archaic cultures. The more recent past is also rich historically.

Available for use by the physical and natural sciences and also other departments of the University are two electron microscopes. Electronic computing machines are available in the Data Processing and Computing Center, and their uses and operation are taught in some mathematics courses.

PROGRAMS OF INSTRUCTION

DEGREE PROGRAMS

The College of Liberal Arts and Sciences grants the Bachelor of Arts degree with the following majors and minors. Suggested programs appear in the next chapter of this bulletin.

Anthropology	Geography	Philosophy
Art ¹	Geology	Physics
Asian Studies ²	Government	Physiology
Biological Sciences ³	Health Science ^{3,4}	Psychology
Botany	History	Religion ²
Central European Studies ²	Home Economics ¹	Russian Studies ²
Chemistry	Inter-American Studies ^{3,4}	Sociology
Economics ¹	Mathematics	Speech ¹
English	Microbiology	Theater ¹
Foreign Languages	Music ¹	Zoology

PREPROFESSIONAL PROGRAMS

A student planning to take preprofessional courses in any of the following areas should, after completing the General Studies program, register in the College of Liberal Arts and Sciences:

¹ These are liberal arts majors, not professional majors. Course descriptions and suggested curricula appear in the following issues of the *Southern Illinois University Bulletin*: School of Fine Arts for art and music, School of Business for economics, School of Home Economics for home economics, School of Communications for speech and theater.

² Minors only.

³ Students who elect to major in these fields are not required to offer a minor for graduation. These programs constitute both major and minor.

⁴ Majors only; no minors offered in these fields.

Dentistry	(3 or 4 years)	Pharmacy	(1 to 4 years)
Law	(3 or 4 years)	Physical Therapy	(2 or 3 years)
Medical Illustration	(4 years)	Public Health	(3 or 4 years)
Medical Technology	(2 or 3 years)	Theology	(2 to 4 years)
Medicine	(3 or 4 years)	Veterinary Science	(3 or 4 years)
Occupational Therapy	(2 or 3 years)		

The School of Agriculture offers three more preprofessional programs.

A preprofessional student may obtain, subject to certain conditions, a bachelor's degree after three years' work (144 quarter-hours) at Southern and one or more years' work in a professional school. During the three years of residence at Southern he should complete all requirements other than elective hours for the bachelor's degree which he is seeking. In some cases, one may complete major and minor requirements by taking certain courses at the professional school, but this is permitted only upon the prior approval of the appropriate department chairman. Also, there needs to be completion of at least one year of professional work with acceptable grades in a Class A medical school, a Class A dental school, a Class A veterinary school, or an approved law school. In every case, all university graduation requirements must be met. It is advisable for a student interested in this program to make his decision to seek a bachelor's degree long before entering the professional school so that any questions may be clarified at an early date.

DENTISTRY, MEDICAL ILLUSTRATION, MEDICAL TECHNOLOGY, MEDICINE, OCCUPATIONAL THERAPY, PHARMACY, PHYSICAL THERAPY, VETERINARY SCIENCE

Professor Harold M. Kaplan is the chairman of a medical advisory committee established to advise all students planning to enter medical school or dental school or to train themselves for careers in related fields.

Each such student should plan his curriculum very carefully. He will need at least two years' work in chemistry, including some qualitative and some organic chemistry, and one year of biology (zoology). If he is not expecting to receive a degree from Southern, he will not necessarily be held to all the requirements for the bachelor's degree at this University; he must, on the other hand, keep constantly in mind the requirements for admission and the later required courses in the special school which he wishes to attend. Each student should write for the catalog of the professional school he plans to enter. Every student should consult the preprofessional advisers, preferably at or before matriculation and periodically thereafter.

LAW

Four years of college studies, with the Bachelor of Arts degree, is the normal preparation for entrance to a law school, although one encounters such variants as institutions that will admit students who have had only three years of college. Law touches practically every human interest, and there is consequently no specific curriculum that constitutes *the* pre-legal program of studies. Instead, one should concentrate on obtaining a good understanding of many facets of human endeavor, cultivating an ability to analyze complex situations, and developing skill in oral and written communication. Guidelines by way of alternative indications of what constitutes a suitable pre-legal curriculum are offered below.

A lawyer needs to possess a broad understanding of the social institutions of his day and of the past from which these were derived. In terms of an undergraduate major and minor, this might well dictate choices from among economics, government, history (especially American and English), and sociology. Both the subject-matter content and the methodology of these disciplines contribute toward a firm foundation for law study.

The importance of clarity and logic in thought processes, plus the special interests of the student, will motivate some to concentrate in fields where the subject matter seems less directly related to the practice of law. Mathematics, philosophy (including logic), foreign languages, and the sciences are all recognized by law schools as useful foundations for the study of law and as being particularly valuable in some of the specializations, such as patent law, in which the practicing attorney may engage.

Still other course selections are indicated by the fact that words are a lawyer's basic tools, reflecting both factual knowledge and thought processes. Courses in composition and speech, and participation in debate activities on an extra-curricular basis, will serve the prospective lawyer well. Moreover, a good basic knowledge of accounting will be found useful when dealing with tax matters and various aspects of business.

The obvious desirability of having some acquaintance with many fields of study should not be carried to a point where one's program is unduly fragmented, touching only lightly on many subjects. Mastery in depth of some subject the student finds intellectually stimulating is an important educational experience.

Most law schools require each prospective student to have taken the Law School Admission Test, which attempts to measure his aptitudes for the study of law, his facility in written communication, and the extent of

his general background preparation. The test is ordinarily taken during the senior year and is given on this campus. The application forms, along with details as to the time and nature of the test, can always be obtained from Law School Admission Test, Educational Testing Service, 20 Nassau Street, Princeton, New Jersey.

PUBLIC HEALTH

The health science curriculum is a preprofessional course designed to meet the current demand for trained personnel in the public health fields. Planned specifically for those students interested in public health sanitation and public health laboratory work, the curriculum crosses departmental boundaries to give one a good basic background in the sciences and social studies. Students with good academic records in this program should have no difficulty in securing admission to a school of public health for graduate work.

The curriculum is sufficiently broad to accommodate students who are interested in premedical or predental careers. Sufficient electives are provided so that minors can be worked out in chemistry or zoology.

THEOLOGY

Any student who plans to enter a graduate theological seminary should consult his clergyman or his major professor at the earliest possible date. He should obtain a catalog of the seminary he plans to enter and prepare himself to meet its specific entrance requirements. The American Association of Theological Schools, which is the accrediting agency accepted by most theological schools, suggests a broad, basic education with an emphasis upon ability to think, speak, and write clearly and correctly. No undergraduate major in religion is offered at Southern Illinois University, but the American Association of Theological Schools believes that such undergraduate specialization is not usually desirable. One may, however, present a minor in religion. Among suitable majors leading to the required bachelor's degree are philosophy, history, sociology, and English.

The American Association of Theological Schools regards the following as a minimum list of fields of study that a student should have before beginning study in a seminary. The work in these fields should be evaluated on the basis of his mastery of these fields rather than in terms of hours of credit. That this recommendation may help the student who is faced with the practical problem of selecting courses, however, it is suggested that he take approximately three-fourths of his college work in the following specific areas:

English.—literature, composition, speech, and related studies.

History.—ancient, modern European, and American.

Philosophy.—orientation in history, content and method.

Natural sciences.—preferably physics, chemistry, and biology.

Social studies.—psychology, sociology, economics, political science, anthropology, education.

Foreign languages.—one or more years of: Latin, Greek, Hebrew, German, French.

Religion.—The pretheology student may well seek counsel of the seminary of his choice in order to use the resources of his college most profitably. Attention is also called to religion courses offered for credit by the off-campus foundations and to the courses in philosophy of religion, sociology of religion, and world religion offered on campus.

AREA STUDIES COMMITTEES

In addition to the regular departments of instruction, the college offers inter-disciplinary programs in African, Asian, Central European, and Russian studies, supervised by special permanent committees. These reflect the college's desire to encourage special programs outside the traditional departmental field, and similar inter-disciplinary programs are being developed in other areas. These programs are described in the next chapter of this bulletin. Any student planning to work in one of these areas should consult the appropriate committee chairman, or the office of the College of Liberal Arts and Sciences.

PUBLIC AFFAIRS RESEARCH BUREAU

First organized as a Local Government Center in 1951, the Public Affairs Research Bureau was approved as an agency of the College of Liberal Arts and Sciences by the Board of Trustees effective July 1, 1958.

The bureau concerns itself with making available certain findings of its staff to various agencies such as public schools, municipalities, business organizations, state and federal government and others in a position to apply these findings in the public interest.

PINE HILLS FIELD STATION

The Pine Hills Field Station is located in the Pine Hill section of the Shawnee National Forest. The 500 acres, under supervision of the University, transects a portion of both the Illinois Ozarks and the Mississippi

flood plain. The rich and diversified flora and fauna of the region have no equal in the mid-Mississippi valley, with 100 species of mosses, 950 species of vascular plants, 125 species of fishes, 25 species of amphibians, 45 species of reptiles, 170 species of birds, and 36 species of mammals.

The station is being developed as a regional resource open to all qualified persons interested in graduate or independent research. For information, write: Chief, Pine Hills Field Station, Southern Illinois University, Carbondale, Illinois 62903.

STUDENT ORGANIZATIONS AND ACTIVITIES

Several academic departments have clubs or other interest groups to allow majors in special areas to become better acquainted with one another and with faculty members and to investigate further their special interests. The following departments have clubs: anthropology, botany, chemistry, English, foreign language (Spanish and German), government (International Relations Club, Young Democrats Club, Young Republicans Club), geology, history, philosophy, and psychology. The following departments have national honors societies: mathematics (Pi Mu Epsilon), government (Pi Sigma Alpha), geography (Gamma Theta Upsilon). The chemistry department has a student affiliate of the American Chemical Society.

In the college there is a Liberal Arts Honors Society, and students of the college qualifying scholastically are eligible for membership in Phi Kappa Phi.

The College of Liberal Arts and Sciences encourages a broad student activity program with opportunities for all students to participate. The many organizations augment the student's educational experiences by assisting him in learning how to plan and carry out responsibilities, how to work with others, how to make wise use of leisure time, and how to develop leadership.

Additional information about student organizations and activities appears in the student handbook *Your Life, Southern Style*, available from the Student Affairs Office, and in the General Information issue of the *Southern Illinois University Bulletin*.

ADMISSION TO THE COLLEGE

Inquiries concerning admission to the college should be addressed to the Admissions Office. Application for admission should be initiated at least thirty days in advance of the desired entrance date. High school

seniors should start the admission process during the first semester of their senior year, but their formal admission will not be considered until after receipt of the high school record showing completion of the seventh semester of high school work.

Freshmen and students who transfer fewer than 90 hours of acceptable credit are admitted to General Studies. Students in General Studies are eligible to petition for admission to the College of Liberal Arts and Sciences when they have completed 75 hours of work. Transfer students who entered Southern with more than 75 hours but who were admitted to General Studies may petition for admission to the college after one quarter's attendance.

COMPLETE DETAILS concerning admission, tuition, fees, housing, degree requirements, and student employment are given in the General Information bulletin. For a free copy write to Central Publications, Southern Illinois University, Carbondale, Illinois 62903.

TUITION AND FEES

At the present time legal residents of Illinois registered for more than eight hours of credit pay a total of \$65.50 per quarter. This includes \$42 tuition, an \$8 book rental fee, a \$5 student union building fund fee, and a \$10.50 student activity fee. Out-of-state students pay an additional \$80 tuition, or a total of \$145.50. Students registered for eight hours or fewer pay one-half tuition, one-half book rental fee, and full student union building fund fee; they have the option of paying the student activity fee.

ADVISEMENT

To insure that an undergraduate student is properly advised concerning the course of study which will fulfill the general University requirements and help him meet his particular educational objective, a program of academic advisement is provided by a selected group from the teaching faculty.

Freshmen and sophomores are advised by advisers under the direction of the executive offices of General Studies, although they may consult with departmental representatives regarding various majors offered by the col-

lege. After a student is admitted to the College of Liberal Arts and Sciences, he is assigned to a specific college adviser under the direction of the dean. In addition, many departments also assign students to a departmental adviser for specific help with selecting courses in the major. The total program is co-ordinated to help the student move easily from the general program to an area of specialization.

Academic advisers are available to help students understand various academic requirements, select appropriate electives, and develop long range educational and vocational plans. A qualified student who has registered at least one time in the college and has a plan of study is encouraged to participate in self advisement for succeeding quarters, checking with an adviser only when he needs help with some change in plans.

REQUIREMENTS FOR THE BACHELOR'S DEGREE

Each candidate for the degree must complete a minimum of 192 hours of credit in approved courses. At least 64 must be in senior college courses, of which 48 must be earned at Southern, 16 of which may be earned in extension from Southern. Each student must have a C average, and grades not lower than C in subjects aggregating at least three-fourths of the work. A C average is required in the major subject. These averages are required for the credit made at Southern as well as for the total record.

The *quarter hour* is the unit of credit used at Southern and throughout this bulletin. One quarter hour is two-thirds of a semester hour.

Every bachelor's degree candidate is expected to meet the University's general requirements and to follow the recommendations of the academic unit in which he intends to do his major work.

For a complete statement of the University's general requirements for a bachelor's degree, please refer to the section headed "Degrees" in the General Information issue of the *Southern Illinois University Bulletin* and to the General Studies issue. The General Studies program is outlined below.

OUTLINE OF GENERAL STUDIES REQUIREMENTS

<i>Area A: Man's Physical Environment and Biological Inheritance</i>	24 hours
A first-level basic sequence	9 hours
A second-level continuation sequence	9 hours
Third-level advanced courses	6 hours
<i>Area B: Man's Social Inheritance and Social Responsibilities</i>	24 hours

A first-level basic sequence	9 hours
A second-level continuation sequence	9 hours
Third-level advanced courses	6 hours
<i>Area C: Man's Insights and Appreciations</i>	24 hours
A first-level basic sequence	9 hours
A second-level continuation sequence	9 hours
Third-level advanced courses	6 hours
<i>Area D: Organization and Communication of Ideas</i>	18 hours
Required college composition and speech	9 hours
Either a foreign language sequence or a basic mathematics sequence	9 hours
<i>Area E: Health and Physical Development</i>	6 hours
First-level required physical education	3 hours
Second-level required health education	3 hours
<i>Total</i>	96 hours

If a General Studies sequence is waived, the total is only 87 hours.

COLLEGE OF LIBERAL ARTS AND SCIENCES REQUIREMENTS

In addition to the above requirements, a candidate for a degree in the College of Liberal Arts and Sciences must have the following:

1. A reading knowledge of a foreign language. This may be satisfied by having satisfied the General Studies foreign language requirement, or the equivalent.

2. Competency in English as demonstrated by completion of specified courses or by passing the Undergraduate English Qualifying Examination.

3. A major of at least 42 hours and a minor of at least 24 hours. All requirements for the major must be satisfied. A list of majors and minors appears on page 2.

In the curricula suggested in the final chapter of this bulletin, reference is made to College of Liberal Arts and Sciences requirements. The 33 hours entered for each such reference include requirement 1, above, and the 24-hour minor. If only 9 hours are entered, courses for the minor are specified in the curriculum.

TEACHING CERTIFICATE

Students enrolled in the College of Liberal Arts and Sciences may meet the state requirements for a high school teaching certificate by using as their electives certain prescribed courses in the College of Education. The high school certificate is valid for four years for teaching in grades six

through twelve of the common schools, renewable in periods of four years upon successful teaching and professional growth satisfactory to the county superintendent of schools.

A student should consult with an adviser as early as possible in his academic career to learn the certification requirements under which he will graduate. He should also familiarize himself with the requirements for admission to student teaching, which are stated in the College of Education bulletin, and make application for this course several quarters before he hopes to do the work.

At the present time the State of Illinois requires all candidates for a secondary teacher's certificate to present evidence that they know the provisions and principles of the Constitution of the United States and of the State of Illinois and to complete professional education courses in educational psychology (Guidance 305), methods and techniques of teaching on the secondary level (Secondary Education 315 or a teaching methods course in the field of specialization), history and principles of secondary education (Secondary Education 310), student teaching, and a certain number of electives.

The student should see the College of Education bulletin for a precise listing of courses required for the standard state certificate and the standard special certificate.

Instructional Units

Courses numbered 100–199 are primarily for freshmen; 200–299 for sophomores; 300–399 for juniors and seniors; and 400–499 for seniors and graduate students. Courses numbered above 499 are for graduate students only and can be offered for undergraduate credit only under special circumstances.

Many courses extend over a period of two or more quarters. The hours of credit per quarter are indicated in parentheses following the course number and total credit. For example, Chemistry 305–8 (4,4) indicates a two-quarter course, four hours of credit per quarter.

Three letters before a course number (e.g. GSA 340 on page 19) mean the course is described in the General Studies bulletin and only titled here.

AFRICAN STUDIES

Although a number of courses concerned with Africa are offered, they are insufficient in hours of credit to permit a minor at this time. The African Studies Committee can give information about the courses available and can also supply advice and assist research on African subjects with its bibliographical and documentary materials. Address the chairman of the committee, Department of Anthropology, Southern Illinois University, Carbondale, Illinois 62903.

ANTHROPOLOGY

Professors Philip J. C. Dark (Chairman), John C. Kelley, Charles H. Lange, Walter W. Taylor.

Associate Professors Pedro Armillas, Melvin L. Fowler, Carroll Riley.

Assistant Professor Bruce MacLachlan.

Instructor Rodger Heglar.

All the major divisions of anthropology are covered, viz. archaeology, ethnology, social anthropology, linguistics, and physical anthropology. Faculty members of the department have had field experience in North, South, and Central America, the Caribbean, Europe, Africa, and the Pacific. Faculty specialization in and field experience of northern Mexico are especially strong. Emphasis is also given to the anthropology of Southern Illinois with special attention to archaeological studies.

SUGGESTED CURRICULUM IN ANTHROPOLOGY

BACHELOR OF ARTS DEGREE, COLLEGE OF LIBERAL ARTS AND SCIENCES

<i>General Studies Requirements</i> (See page 9.)	96
<i>Air Science Requirement</i> (See the General Information bulletin.)	3
<i>College of Liberal Arts and Sciences Requirements</i> (See page 10.)	33
<i>Requirements for the Major in Anthropology</i>	60
Anthropology 300, 303, 304, 9 hours from 305 and/or 306, 400, 401, 404, 405, 408, 409	42
At least 3 hours in each of the following: geography, geology, philosophy, psychology, sociology, and zoology	18
<i>Total</i>	<u>192</u>

Majors are expected to familiarize themselves with the contents of certain basic anthropological publications, whether these fall within the required courses or not. A list of these publications will be provided, and the student is expected to work out a reading program under the supervision of his adviser.

MINOR

A minor in anthropology consists of Anthropology 300, 304, 400, 409, and 10 hours in courses above 300. The student is advised to consult the department before selecting his electives.

COURSE DESCRIPTIONS

- 300-3 PHYSICAL ANTHROPOLOGY. Man as a biological being, his relationships to other living things. Human origins and development. Concept of race and the races of mankind. Human genetics and normal human variation.
- 303-3 OLD WORLD PREHISTORY. A survey of man's earliest cultural beginnings. Paleolithic and Neolithic periods in Europe, Africa, the Near East, and Asia.
- 304-3 THE ORIGINS OF CIVILIZATION. A study of the complex environmental and cultural factors that led to the rise and fall of early high-cultures in both the Old and New Worlds.

- 305-9 (3, 3, 3) PEOPLES AND CULTURES OF THE WORLD I. The biological and cultural history of man in (a) North America, (b) Asia, and (c) Oceania from early times to the present.
- 306-9 (3, 3, 3) PEOPLES AND CULTURES OF THE WORLD II. The biological and cultural history of man in (a) South America, (b) Europe, and (c) Africa from early times to the present.
- 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."
- 401-4 LANGUAGE IN CULTURE. Language as a part of culture. Linguistics and the study of culture.
- 404-4 PRIMITIVE ART AND TECHNOLOGY. The development of man as a tool-using and art-loving being. Artistic and technological traditions of non-Western peoples, past and present.
- 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 principals 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.
- 483-3 to 18 INDIVIDUAL STUDY IN ANTHROPOLOGY. Guided study upon anthropological problems. Students should consult the department before enrolling.
- 501-9 (3, 3, 3) Pro-seminar in Physical Anthropology.
- 503-9 (3, 3, 3) Pro-seminar in Archaeology.
- 505-9 (3, 3, 3) Pro-seminar in Linguistics.
- 507-9 (3, 3, 3) Pro-seminar in Social Anthropology.
- 509-9 (3, 3, 3) Pro-seminar in Ethnology.
- 510-3 to 27 Seminar in New World Archaeology.
- 511-3 to 27 Seminar in Meso-American Archaeology.
- 512-3 to 27 Seminar in Old World Archaeology.
- 520-3 to 27 Seminar in the Ethnology of the New World.
- 521-3 to 27 Seminar in the Ethnology of Meso-America.
- 522-3 to 27 Seminar in the Anthropology of Oceania.
- 523-3 to 27 Seminar in the Anthropology of Africa.
- 524-3 to 27 Seminar in the Anthropology of Europe.
- 535-3 to 27 Seminar in Physical Anthropology.
- 545-3 to 27 Seminar in Linguistics.
- 550-3 to 27 Seminar in the Cultures of Latin America.
- 560-3 to 27 Seminar in Comparative Social Organization.
- 562-3 to 27 Seminar in the Anthropology of Contemporary Peoples.
- 565-3 to 27 Seminar in Cultural Change and Development.
- 567-3 to 27 Seminar in Anthropological Theory and Method.
- 570-3 to 27 Seminar in Art and Technology.
- 575-3 to 27 Seminar in the Individual and Culture.

- 581-3 to 27 Seminar in Anthropology.
- 582-3 to 27 Problems in Archaeology.
- 584-3 to 27 Problems in Cultural Anthropology.
- 585-3 to 27 Readings in Anthropology.
- 597-3 to 27 Fieldwork in Anthropology.
- 599-3 to 9 Thesis.
- 600-1 to 48 Dissertation.

ART

The Department of Art in the School of Fine Arts offers specialization in art history for students in the College of Liberal Arts and Sciences. Consult the department chairman for curriculum planning.

If a student in the College of Liberal Arts and Sciences wishes to minor in art, he should choose his minor from one of the five specialized minors in art history, crafts, painting, prints, and sculpture and consult with the department adviser for the area. These specialized minors do not fulfill requirements for the teaching of art. A complete list of courses offered by this department and course descriptions are to be found in the bulletin of the School of Fine Arts.

ASIAN STUDIES

A minor in Asian studies is offered within the College of Liberal Arts and Sciences. To qualify for this minor, a student must present a minimum of 30 hours to be chosen from at least three departments from a list of offerings approved by the Committee on Asian Studies. Not more than 12 hours may be taken in any one department. The approved courses cover areas of instruction in agriculture, anthropology, art, economics, foreign language, geography, government, history, and philosophy.

For a leaflet describing the program in Asian studies, write to the Chairman, Committee on Asian Studies, Southern Illinois University, Carbondale, Illinois 62903.

BIOLOGICAL SCIENCES

The curriculum is designed to give the student a broad training in the biological sciences or to prepare him for teaching biology in the high school. Courses in allied fields of science are included to provide a background for complete understanding of the biological sciences.

During his freshman year, any student following this program (in either college) should consult the chairman of the Department of Botany or of the Department of Zoology. A detailed curriculum is available in the departmental office.

BACHELOR OF ARTS DEGREE, COLLEGE OF LIBERAL ARTS AND SCIENCES

<i>General Studies Requirements</i> (See page 9.)	87
<i>Air Science Requirement</i> (See the General Information bulletin.)....	3
<i>College of Liberal Arts and Sciences Requirements</i> (See page 10.)	9
This curriculum includes the major and the minor.	
<i>Requirements for the Major in Biological Sciences</i>	72
General Studies Area A 201-9, 301-4	(13)
General Studies Area D 108-9 or 114-9	(9)
Botany 300, 313	6
Chemistry 111-15 (or GSA 101-9 with Chemistry 101b,c and 350)	15
Microbiology 301	5
Zoology 102, 103	10
Additional hours of concentration in any one of the four biology departments	30
Electives in biology	6
<i>Electives</i>	21
<i>Total</i>	192

BACHELOR OF SCIENCE IN EDUCATION DEGREE, COLLEGE OF EDUCATION

A student may undertake this program in the College of Education in which case he must satisfy all requirements of that college for the Bachelor of Science in Education degree. The requirements for the major are the same in both colleges.

MINOR

A minor in biological sciences consists of the following courses: GSA 201-9, GSA 301, Botany 300, 301, Microbiology 301, Zoology 102, 103, for a total of 34 hours.

BOTANY

Professors William D. Gray, Ladislao V. Olah, Jacob Verduin, John W. Voigt, Walter B. Welch.

Associate Professors William C. Ashby, Margaret Kaeiser, Robert H. Mohlenbrock (Acting Chairman).

Assistant Professors Donald A. Eggert, William M. Marberry, Aristotel J. Pappelis, Walter E. Schmid.

SUGGESTED CURRICULUM IN BOTANY

BACHELOR OF ARTS DEGREE, COLLEGE OF LIBERAL ARTS AND SCIENCES

Prospective majors are urged to consult with the chairman of the department.

<i>General Studies Requirements</i> (See page 9.)	87
<i>Air Science Requirement</i> (See the General Information bulletin.)	3
<i>College of Liberal Arts and Sciences Requirements</i> (See page 10.)	33
<i>Requirements for the Major in Botany</i>	43-73
General Studies Area A 201-9 (5 hours count toward the 48-hour major in botany)	(9)
Botany courses selected in consultation with the chairman of the department	43
Chemistry and mathematics: a background of basic courses	0-30
<i>Electives</i>	0-26
<i>Total</i>	192-205

MINOR

A minor consists of a minimum of 24 hours in botany, including GSA 201-9 (which contributes only 5 hours) and excluding Botany 390 and 391. Anyone minoring in botany should consult with the chairman of the Department of Botany concerning his program.

COURSE DESCRIPTIONS

- 131-5 FIELD BIOLOGY. For those who are planning to teach in elementary schools. Methods for the identification of various types of plants and animals; location of source material suitable for teaching nature study.
- 300-3 MORPHOLOGY OF NON-VASCULAR PLANTS. Introduction to the structure, development, and relationships of the algae, fungi, and bryophytes. Prerequisite: GSA 201c.
- 301-3 MORPHOLOGY OF VASCULAR PLANTS. Introduction to the structure, development, and relationships of the fern-allies, ferns, gymnosperms, and angiosperms. Prerequisite: GSA 201c. Recommended: Botany 300.
- 308-5 TAXONOMY AND CULTIVATED PLANTS. A study of the classification of woody and herbaceous cultivated plants, both exotic and native. Prerequisites: GSA 101c, Botany 203.
- 313-3 NATURAL HISTORY OF LOCAL PLANTS. Increases insight and appreciation of plants. Identification and natural history stressed. Lecture, laboratory. Field trip costs about \$5. Prerequisite: GSA 201c.

- 315-4 PLANT GENETICS. A general course involving principles of evolution and genetics of plants. Prerequisite: minor in agriculture, botany, or zoology.
- 320-5 ELEMENTS OF PLANT PHYSIOLOGY. A study of the functions of plants in relation to the various organs. Laboratory. Prerequisite: GSA 201c; Chemistry 350 or a minor in chemistry.
- 321-3 to 5 ELEMENTARY BOTANICAL MICROTÉCHNIQUE. Methods in preservation and preparation of plant materials, both non-vascular and vascular. Prerequisite: GSA 201c.
- GSA 340-3 ECOLOGY.
- 341-3 AUTÉCOLOGY. An introduction to plant life processes and life form in relation to the factors of the environment. Prerequisite: 320, GSA 340, or consent of instructor. Field and laboratory expenses \$5.
- GSA 345-3 ECONOMIC BOTANY.
- 390-2 to 4 READINGS IN BOTANY. A course of individually assigned readings in classical botanical literature; both oral and written reports required; open only to undergraduate students. Prerequisite: a major or minor in botany and consent of instructor.
- 391-2 to 5 SPECIAL PROBLEMS IN BOTANY. Individual laboratory or field work under supervised direction. Both written and oral discussions required; open only to undergraduate students. Prerequisite: major or minor in botany and consent of department.
- 400-5 PLANT ANATOMY. An introduction to cell division, development, and maturation of the structures of the vascular plants. Laboratory. Prerequisite: 301.
- 404-4 THE ALGAE. Structure, development, and relationships of the algae. Laboratory and some field work. Prerequisite: 300.
- 405-5 MYCOLOGY. Structure, development, and relationships of fungi. Problems of economic and scientific interest stressed. Laboratory. Prerequisite: 300.
- 411-4 THE BRYOPHYTES AND PTERIDOPHYTES. Structure, development, and relationships of the liverworts and mosses, and the ferns and fern allies. Laboratory. Prerequisite: 300.
- 412-4 THE SPERMATOPHYTES. Structure, development, and relationships of the gymnosperms and angiosperms. Laboratory. Prerequisite: 301.
- 414-5 PALEOBOTANY. An introduction to the study of fossil plants emphasizing the major features of plant evolution and the applications of paleobotany to problems in the botanical and geological sciences. Lecture, laboratory. Field trips. Cost about \$5. Prerequisite: 400 or consent of instructor.
- 420-4 PHYSIOLOGY OF FUNGI. Environmental and nutritional factors involved in the growth, reproduction, and metabolism of the fungi. Prerequisite: consent of instructor.
- 425-15 (5, 5, 5) ADVANCED PLANT PHYSIOLOGY. (a) Water relations, membrane phenomena, interaction of light with plants; (b) photosynthesis, the elaboration and manipulation of carbon compounds in plant cells; (c) mineral nutrition of plants. Three lectures and four hours of laboratory per week. Should be taken in a,b,c sequence. Prerequisites: 320, Chemistry 350, physics, or consent of instructor.
- 428-3 PLANT NUTRITION. The physiological importance of carbon-, nitro-

- gen-, and phosphorus-containing compounds is stressed. Prerequisites: 320.
- 440-4 ECOLOGY OF GRASSES AND GRASSLANDS. Structure, analysis, and dynamics of grassland communities; structure and growth of individual species. Field and laboratory work costs about \$5. Prerequisite: GSA 340 or consent of instructor.
- 445-5 ECOLOGY OF FORESTS AND ARABLE LANDS. Forest areas in North America. Developmental and structural analysis of forest types. Autecology of important species. Field trips cost about \$10. Prerequisite: plant ecology or silviculture or consent of instructor.
- 449-3 ELEMENTS OF TAXONOMY. Principles of taxonomy including historical sketch, phyletic concepts, biosystematics, classical and experimental methods. Lecture, laboratory. Prerequisite: 313.
- 450-3 PLANT GEOGRAPHY. World distribution of plants related to environmental, floristic, and historical factors. Prerequisites: 3 courses in botany or geography or consent of instructor.
- 451-4 INTRODUCTION TO FLORISTICS. Principles involved and methods used in the analysis of the flora of an area. Field trips cost about \$5. Prerequisite: 313.
- 455-4 MEDICAL MYCOLOGY. Fungi which are responsible for infection of man and animals. Problems of classification, identification, isolation, and activity of these fungi. Prerequisites: 405, Microbiology 301 or consent of instructor.
- 456-5 PLANT PATHOLOGY. A study of plant diseases caused by fungi, bacteria, and viruses. Special attention given diseases of Southern Illinois plants. Laboratory and field trips. Prerequisite: consent of instructor.
- 457-4 FOREST PATHOLOGY. Nature and control of forest and shade tree diseases. A study of tree diseases in forests, parks, streets, and nurseries. Fungi important in decay and stain of timber and its products will be included. Prerequisite: 456 or consent of instructor.
- 470-4 METHODS OF TEACHING HIGH SCHOOL BIOLOGY. A study of methods, consisting of consideration of objectives, different types of courses, teaching the scientific method, laboratory method, project method, field methods, measurements, evaluation, and other problems in the teaching of the biological sciences. Prerequisite: Minor in botany or zoology or consent of instructor.
- 480-4 CLASSIC PRINCIPLES OF BOTANY. Theories, principles, and developments in the various divisions of the plant sciences. Prerequisite: consent of instructor.
- 501-4 Plant Biology for High School Teachers.
- 502-2 Recent Development in Biological Sciences.
- 503-15 (5, 5, 5) Advanced Angiosperm Taxonomy.
- 507-8 BSCS—High School Biology.
- 522-5 Advanced Microtechnique.
- 525-5 Cytology.
- 526-5 Cytogenetics.
- 533-3 to 4 Growth and Development in Plants.
- 542-4 Genecology and Community Concepts.
- 543-5 Experimental Ecology.
- 551-4 Natural Vegetation of Mississippi Basin—Upland.

- 552-4 Mississippi Flora Aquatic.
- 555-4 Advanced Plant Pathology I.
- 556-4 Advanced Plant Pathology II.
- 557-4 Advanced Plant Pathology III.
- 570-2 to 5 Readings.
- 580-1 to 4 Seminar.
- 590-2 to 4 Introduction to Research.
- 591-3 to 9 Problems and Introduction to Research.
- 599-3 to 9 Thesis.
- 600-1 to 36 Dissertation.

CHEMISTRY

Professors Talbert W. Abbott (Emeritus, 1961), Roger E. Beyler, George E. Brown, Elbert H. Hadley (Acting Chairman), James W. Neckers, R. A. Scott (Emeritus, 1960), Kenneth A. Van Lente.

Associate Professors Albert L. Caskey, Wilbur N. Moulton, Boris Musulin, Russell F. Trimble, Jr., Robert E. Van Atta.

Assistant Professors James N. BeMiller, J. Herbert Hall, Melvin D. Joesten, Richard J. Ruch.

Instructor William N. Sanders

Research Associate Sujit K. Bhattacharya

A student majoring in chemistry must have a 3.0 average in chemistry courses to start the second year of the major. He should have a 3.25 average in chemistry courses, and/or consent of the department, to start his third and fourth years of work toward the major.

SUGGESTED CURRICULA IN CHEMISTRY

BACHELOR OF ARTS DEGREE, A.C.S.,
COLLEGE OF LIBERAL ARTS AND SCIENCES

The following curriculum meets requirements for certification by the American Chemical Society. A student desiring to follow this curriculum should consult the Department of Chemistry for a recommended curriculum outline covering in detail his four years of study, and for changes in A.C.S. requirements.

<i>General Studies Requirements</i> (See page 9.)	87
<i>Air Science Requirement</i> (See the General Information bulletin.)	3
<i>College of Liberal Arts and Sciences Requirements</i> (See page 10.)	33
<i>Requirements for the Major in Chemistry</i> (with A.C.S. certification	104
General Studies Area D 114b,c	(6)
Chemistry 111-15, 221, 235 or 331, 341-14, 411, 432,	
433, 444, 446, 461-12, 490	67-69

Chemistry 412, 447, 451a, 451b, 471 (any one)	3-4
German (one year)	(9)
Mathematics 150-10, 252-9	19
Physics (one year)	15
<i>Total</i>	227
<i>Total</i> (if the minor is mathematics)	211

BACHELOR OF ARTS DEGREE, COLLEGE OF LIBERAL ARTS AND SCIENCES

<i>General Studies Requirements</i> (See page 9.)	87
<i>Air Science Requirement</i> (See the General Information bulletin.)	3
<i>College of Liberal Arts and Sciences Requirements</i> (See page 10.)	33
<i>Requirements for the Major in Chemistry</i>	82
General Studies Area D 114b,c	(6)
Chemistry 111-15, 221, 432, 490	24
Chemistry 235 or 331; 460 or 461-12	8-15
Chemistry 305-8 or 341-14, and courses selected from 350, 375, 411, 412, 433, 444, 446, 447, 451, 471 to complete at least 48 hours in chemistry	12-16
German (one year)	(9)
Mathematics 150-10, 252-9	19
Physics (one year)	15
<i>Total</i>	205
<i>Total</i> (if the minor is mathematics).....	192

MINOR

A minimum of twenty-four hours of chemistry is required for a minor including 111-10 and at least one course from each of two of the following fields: analytical chemistry, biological chemistry, organic chemistry. Some chemistry course sequences constituting acceptable minors are: 111-15, plus one of the following sequences: 101c (with GSA 101c), 235; or 221, 305-8; 305-8, or 101c (with GSA 101c), 221, 350; or 101c (with GSA 101c), 230, 350; or 305-8, 350; or 235, 305-8; or 235, 305-8, 350. Another acceptable sequence is 111-10, 230, 305-8, 350.

COURSE DESCRIPTIONS

- 101-2 (1, 1) OPTIONAL LABORATORY FOR GSA 101. Elementary general and organic chemistry laboratory. Prerequisite: concurrent enrollment in GSA 101b or c.
- 111-15 (5, 5, 5) GENERAL-INORGANIC CHEMISTRY. Required for engineering students and all students requiring more than one year chem-

- istry. High school chemistry is not a requirement. Lecture, quiz, and laboratory hours. Must be taken in a,b,c sequence.
- 221-3 QUALITATIVE ANALYSIS. 2 lecture and 3 laboratory hours per week. Prerequisite: 111c and knowledge of logarithms.
- 230-4 GENERAL ANALYTICAL CHEMISTRY. A survey course in chemical analysis not open to chemistry majors. A brief introduction to various analytical methods. Qualitative and quantitative measurements, including gravimetry, volumimetry, colorimetry, and other techniques. 2 lecture and 6 laboratory hours per week. Prerequisite: 101b (with GSA 101b) or 111b.
- 235-5 GENERAL QUANTITATIVE ANALYSIS. A course particularly for pre-professional students. 3 lecture and 6 laboratory hours per week. Prerequisite: 111c and knowledge of logarithms.
- 305-8 (4, 4) ORGANIC CHEMISTRY, PREPROFESSIONAL. For chemistry minors and preprofessional students. Lecture and laboratory. Must be taken in a,b sequence. Prerequisite: 111b.
- 331-3 INTRODUCTORY QUANTITATIVE ANALYSIS. 2 lecture and 3 laboratory hours per week. Prerequisite: 221.
- 341-14 (4, 5, 5) ORGANIC CHEMISTRY. (a) 3 lecture and 3 laboratory hours. (b,c) 3 lecture and 6 laboratory hours. Must be taken in a,b,c sequence. Prerequisite: 111c.
- 350-4 BIOLOGICAL CHEMISTRY. A brief introduction to metabolism, nutrition, and the chemistry of the important biological processes in plants and animals. 3 lecture and 3 laboratory hours per week. Prerequisite: 101c (with GSA 101c) or 305b or 341c. Not for chemistry majors.
- 375-0 to 2 SENIOR SEMINAR. For seniors majoring in chemistry.
- 411-3 INTERMEDIATE INORGANIC CHEMISTRY. Modern inorganic chemistry involving atomic structure, chemical bonds, complexes, and chelate structures; chemistry of familiar and less familiar elements. 3 lecture hours per week. Prerequisites: 235 or 331, 305b or 341c.
- 412-3 INORGANIC PREPARATIONS. A study of several important types of inorganic syntheses. 1 lecture and 6 laboratory hours per week. Prerequisite: 411.
- 432-4 INSTRUMENTAL ANALYTICAL TECHNIQUES. Theory and practice of common instrumental analytical measurements. 2 lecture and 6 laboratory hours per week. Prerequisites: 235 or 331, 305b or 341c, and one year of physics.
- 433-4 INTERMEDIATE QUANTITATIVE ANALYSIS. A comprehensive study of complex methods of analysis, with emphasis on separations. 2 lecture and 6 laboratory hours per week. Prerequisite: 460 or 461b.
- 444-3 ORGANIC REACTIONS. An intermediate course with emphasis on monofunctional compounds. 3 lecture hours per week. Prerequisite: 341c.
- 446-4 QUALITATIVE ORGANIC CHEMISTRY. A systematic study of the separation and identification of organic compounds by a procedure based on solubility and classification reagents. 2 lecture and 6 laboratory hours per week. Prerequisite: 305b or 341c.
- 447-3 QUANTITATIVE ORGANIC CHEMISTRY. The determination of functional groups and elements commonly found in organic compounds by selected methods of analysis; illustration of general method of procedure in the field of quantitative organic chemistry. 1 lecture and 6 laboratory hours per week. Prerequisite: 305b or 341c, 235 or 331.

- 451-11 (3, 3 to 4, 3 to 4) **BIOCHEMISTRY.** (a) Chemistry, function, and metabolism of carbohydrates; energy metabolism, vitamins. 3 lectures per week. (b) Enzymes, lipids, amino acids, proteins. Modern laboratory methods. 3 lectures and 3 laboratory hours per week. (c) Enzyme kinetics, nucleic acids, comparative biochemistry. 3 lectures and 3 laboratory hours per week. Must be taken in a,b,c sequence. Prerequisites: 305b or 341c, 235 or 331.
- 460-5 **THEORETICAL CHEMISTRY.** Traditional aspects of physical chemistry without the use of calculus. 3 lectures and 6 labs per week. Prerequisites: 305b or 341c; 235 or 331 (may be taken concurrently).
- 461-12 (4, 4, 4) **PHYSICAL CHEMISTRY.** (a) Gases, liquids, solids, solutions, homogeneous and heterogeneous equilibria. (b) Chemical kinetics, electrical conductance, electromotive force, and electrolytic equilibrium. (c) Chemical thermodynamics, the quantum theory, nuclear structure, photochemistry, atomic and molecular structure. 3 lecture and 3 laboratory hours per week. Must be taken in a,b,c sequence. Prerequisites: 331 (may be taken concurrently), 341c, twelve hours of physics, and one year of calculus.
- 471-3 **INDUSTRIAL CHEMISTRY.** A survey course on modern industrial chemistry and an introduction to chemical research processes. 3 lecture hours per week. Prerequisite: 305b or 341c.
- 490-2 **CHEMICAL LITERATURE.** A description of the various sources of chemical information and the techniques for carrying out literature searches as well as an introduction to nomenclature. 2 lecture hours per week. Prerequisites: 235 or 331, 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. (a) analytical, (b) biochemistry, (c) inorganic, (d) organic, (e) physical. Prerequisites: senior standing, major in chemistry with 4.0 average, and consent of department.
- 511-9 (3, 3, 3) Advanced Inorganic Chemistry.
- 517-3 Laboratory Techniques in Inorganic Chemistry.
- 519-2 to 30 Advanced Topics in Inorganic Chemistry.
- 531-3 Theory of Quantitative Analysis.
- 532-3 Instrumental Methods of Analysis.
- 533-3 Industrial Analytical Methods.
- 539-2 to 30 Advanced Topics in Analytical Chemistry.
- 541-3 Advanced Organic Chemistry.
- 542-3 Advanced Organic Chemistry.
- 543-3 Advanced Organic Chemistry.
- 547-3 to 6 Advanced Laboratory Preparations in Organic Chemistry.
- 549-2 to 30 Advanced Topics in Organic Chemistry.
- 551-3 Advanced Biochemistry.
- 552-3 Advanced Biochemistry.
- 553-3 Advanced Biochemistry.
- 559-2 to 30 Advanced Topics in Biochemistry.
- 561-3 Chemical Thermodynamics.
- 562-3 Atomic and Molecular Structure.
- 563-3 Chemical Kinetics.
- 569-2 to 30 Advanced Topics in Physical Chemistry.

- 575-1 to 3 Graduate Seminar.
594a-2 to 6 Special Readings in Chemistry, Analytical.
594b-2 to 15 Special Readings in Chemistry, Biochemistry.
594c-2 to 6 Special Readings in Chemistry, Inorganic.
594d-2 to 6 Special Readings in Chemistry, Organic.
594e-2 to 6 Special Readings in Chemistry, Physical.
595a-1 to 9 Advanced Seminar in Chemistry, Analytical.
595b-1 to 9 Advanced Seminar in Chemistry, Biochemistry.
595c-1 to 9 Advanced Seminar in Chemistry, Inorganic.
595d-1 to 9 Advanced Seminar in Chemistry, Organic.
595e-1 to 9 Advanced Seminar in Chemistry, Physical.
596a-3 to 9 Advanced Chemical Problems, Analytical.
596b-3 to 9 Advanced Chemical Problems, Biochemistry.
596c-3 to 9 Advanced Chemical Problems, Inorganic.
596d-3 to 9 Advanced Chemical Problems, Organic.
596e-3 to 9 Advanced Chemical Problems, Physical.
597a-3 to 15 Research and Thesis, Analytical.
597b-3 to 15 Research and Thesis, Biochemistry.
597c-3 to 15 Research and Thesis, Inorganic.
597d-3 to 15 Research and Thesis, Organic.
597e-3 to 15 Research and Thesis, Physical.
598a-3 to 48 Doctoral Research, Analytical.
598b-3 to 48 Doctoral Research, Biochemistry.
598c-3 to 48 Doctoral Research, Inorganic.
598d-3 to 48 Doctoral Research, Organic.
598e-3 to 48 Doctoral Research, Physical.
600a-3 to 48 Dissertation, Analytical.
600b-3 to 48 Dissertation, Biochemistry.
600c-3 to 48 Dissertation, Inorganic.
600d-3 to 48 Dissertation, Organic.
600e-3 to 48 Dissertation, Physical.

ECONOMICS

The Department of Economics, an academic unit of the School of Business, offers a curriculum leading to the Bachelor of Arts degree in the College of Liberal Arts and Sciences. The curriculum and the courses are described in the bulletin of the School of Business.

ENGLISH

Research Professor Harry T. Moore.

Professors Percy Guy Adams, James G. Benziger, E. C. Coleman, Robert D. Faner (Chairman), Jesse W. Harris, Henry Dan Piper, Charles D. Tenney, Georgia Gantt Winn.

Associate Professors Frances M. Barbour, Daniel Cook, Edith S. Krappe, Robert B. Partlow, Jr., William E. Simeone, E. Earle Stibitz, Howard W. Webb, Jr.

Assistant Professors Julia M. Barber (Emerita, 1957), Ted Boyle, Winifred Burns, George C. Camp, Thomas Cassidy, Elizabeth A. Cox (Emerita, 1949), John M. Howell, John Joseph Leonard, Fred K. Lingle, Robert Mortenson, Roy G. Pickett, Raymond S. Rainbow, Jr., Muriel West.

Instructors Leon Bennett, Martha M. Clark, Charles T. Crowe, Diana L. Dodd, Richard Dozier, C. A. J. Giffard, Dalton Gross, Robert B. Harrell, Lewis J. Hilliard, Frances T. Huff, Bettie Shull Hughes, Gabriel G. Kajeckas, Jean Kittrell, Richard Lawson, Edward McNichols, Joan F. Martin, Betty Lou H. Mitchell, Peter Notaras, Lois Anne Richman, Paul G. Schlueter, Edna S. Travis, Lois Van Rooy, Roy Weshinsky, Francis Young.

Visiting Professor Thomas W. Baldwin.

Lecturers Rose Black, Mary Hartzog, Emilyn S. Morris, Mary Simon, Marion Dill Smith, Mary Virginia Wright.

SUGGESTED CURRICULA IN ENGLISH

The student should consult the department chairman as soon as he knows that he will major in English, and should thereafter have his advance registration approved by the chairman each quarter. Deviations from the generally prescribed major requirements should not be made without prior approval. Membership in the English Club is expected.

BACHELOR OF ARTS DEGREE, COLLEGE OF LIBERAL ARTS AND SCIENCES

<i>General Studies Requirements</i> (See page 9.)	96
<i>Air Science Requirement</i> (See the General Information bulletin.)....	3
<i>College of Liberal Arts and Sciences Requirements</i> (See page 10.)	33
<i>Requirements for the Major in English</i>	42
GSC 201 or 209 or 210, and 202	(6)
English 300, 302-12, 309a, 390	23
One 400-level course in each of the "types." These three courses should be selected so as to fall into three different literary periods. See "types" and "periods" below.	12
English electives numbered above 299 to complete 48 hours in English	7
Foreign Language (one year, preferably French or German)	(9)
<i>Electives</i>	18
Recommended electives are GSC 301; English 485; extra courses in types and periods; courses in criticism, linguistics, professional writing; and certain courses in philosophy.	
<i>Total</i>	192

Types

Poetry: 404a,b; 420a,b; 421a,b,c,d; 473
 Drama: 460a,b,c,d; 464; 468; 471a,b
 Fiction: 454a,b,c; 456; 458a,b

Periods

The Medieval: 404a,b
 The Renaissance: 412a; 460a,b; 471a,b
 The 17th–18th Centuries: 412b,c; 441; 454a; 460c; 473
 The 19th Century: 420a; 421a,b,c; 443; 454b; 458a
 The 20th Century: 420b; 421d; 454c; 456; 458b; 460d; 464; 468

BACHELOR OF SCIENCE IN EDUCATION DEGREE, COLLEGE OF EDUCATION

The curriculum leading to the Bachelor of Science in Education degree with a major in English in the College of Education includes the following *Requirements for the Major in English*:

All of the courses required on page 26 for the major	41
English 485	4
English electives to complete 48 hours	3

Other requirements for the degree are listed under Secondary Education in the College of Education bulletin.

MINOR

The English minor is 25 hours, prescribed as follows: from sophomore work, 6 hours; 300; 309a; 302a,b or 302b,c; 390. Deviations from this minor should have the approval of the chairman of the department.

COURSE DESCRIPTIONS

- 100-0 ENGLISH COMPOSITION: GRAMMAR AND USAGE. Required of all freshmen who need additional training in the fundamentals of grammar and usage (for these students, 100 is a prerequisite for GSD 101a and 103).
- 105-3 to 6 ENGLISH AS A FOREIGN LANGUAGE. Open to foreign students only. Maximum of 3 hours to be earned per quarter; graduate students receive no credit.
- 106-4 INTERMEDIATE ENGLISH FOR FOREIGN BORN. Basic principles of American English usage and composition. Improvement of reading skills.
- 300-4 PRINCIPLES OF GRAMMAR. Required of majors and minors in English. Majors and minors other than in English should take 391. Credit not allowed for both courses.
- GSC 301-3 INTRODUCTION TO SEMANTICS.

- 302-12 (4, 4, 4) ENGLISH LITERATURE. A survey (a) to 1550, (b) 1550-1750, (c) after 1750. All three courses are required of English majors. May be taken in any sequence.
- 309-8 (4, 4) AMERICAN LITERATURE. A survey (a) to 1860, (b) since 1860. May be taken in either sequence.
- GSC 313-3 FOLKLORE.
- GSC 318-3 BRITISH MODERN LITERATURE AND ITS SOCIAL CONTEXT. (Summer, abroad.)
- GSC 321-3 REVOLUTION AND ROMANTICISM.
- GSC 335-3 STUDIES IN SHORT FICTION.
- GSC 345-3 WORLD LITERATURE.
- GSC 365-3 SHAKESPEARE.
- 390-3 ADVANCED COMPOSITION. Expository writing.
- 391-3 USAGE IN SPOKEN AND WRITTEN ENGLISH. The essentials of grammar and the "common decencies." Prerequisite to student teaching, except for English majors and minors, who take 300.
- 392-3 PROFESSIONAL WRITING I. Introductory course for undergraduates. Prerequisite to 492, but credit for the course does not constitute automatic admission to 492. Prerequisite: consent of instructor.
- 400-4 INTRODUCTION TO LINGUISTICS. An analysis of English structure, its phonemics, morphemics, and syntax. Recommended for those preparing to teach English grammar and needing an introduction to the structural approach.
- 403-4 THE HISTORY OF THE ENGLISH LANGUAGE. A survey of the development of the language from Indo-European to modern English with special emphasis on Middle and Early Modern English changes.
- 404-8 (4, 4) MEDIEVAL LITERATURE. (a) Contemporaries and successors of Chaucer: late fourteenth and early fifteenth century English literature, from *Sir Gawayne and the Grene-Knight* to the Scottish Chaucerians, and (b) Chaucer. May be taken singly.
- 412-12 (4, 4, 4) ENGLISH NONDRAMATIC LITERATURE. (a) 16th century, (b) 17th century, (c) 18th century. May be taken singly.
- 420-8 (4, 4) AMERICAN POETRY. A survey of (a) trends in American poetry to 1900 with a critical analysis of the achievement of the more important poets and (b) the more important poets since 1900. May be taken singly. Prerequisite: 309a or 309b.
- 421-16 (4, 4, 4, 4) ENGLISH POETRY. (a) Early Romantics: major emphasis on general background and on Blake, Coleridge, and Wordsworth; (b) Later Romantics: emphasis on Byron, Shelley, and Keats, the minor figures; (c) Victorian Poets: Tennyson, Browning, Arnold, and other poets of England, 1830-1900; (d) Modern British Poets. May be taken singly.
- 431-12 (4, 4, 4) MAJOR AMERICAN WRITERS. Significant writers of fiction and non-fictional prose from the Puritans to the twentieth century. (a) 1620-1800, (b) 1800-1865, (c) 1865-1915. May be taken singly.
- 438-4 INTELLECTUAL BACKGROUNDS OF AMERICAN LITERATURE. The relationship of basic ideas in America to American literature. Prerequisite: 309a or b.
- 441-4 THE EIGHTEENTH CENTURY ESSAY. The informal essay and the literary periodicals—*The Spectator*, *Tatler*, *Guardian*, *Rambler*, *Idler*, and Goldsmith's *Citizen of the World* ("Chinese Letters").

- 443-4 VICTORIAN PROSE. The chief writers of nonfiction prose from the late romantics to 1900. Prerequisite: 302c.
- 447-4 AMERICAN HUMOR AND SATIRE. A consideration of the writers and forms of nineteenth and twentieth century humor.
- 454-12 (4, 4, 4) ENGLISH FICTION. (a) 18th century: Defoe through Jane Austen; (b) Victorian novel: 1830-1900; (c) 20th century. May be taken singly.
- 456-4 CONTEMPORARY CONTINENTAL FICTION.
- 458-8 (4, 4) AMERICAN FICTION. (a) The novel in America from its beginnings to the early 20th century, (b) trends and techniques in the American novel and short story since 1914. May be taken singly.
- 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, the Jacobean and Caroline playwrights: Jonson, Webster, Marston, Middleton, etc., but excluding Shakespeare, (b) Jacobean Drama covering the Jacobean and Caroline playwrights: Jonson, Webster, Marston, Middleton, Beaumont, and Fletcher, Massinger, Ford Shirley, etc., (c) Restoration and Eighteenth Century Drama covering the British drama after 1660, with representative types of plays from Dryden to Sheridan, (d) Modern British Drama. May be taken singly.
- 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. Prerequisite: 309a or 309b.
- 471-8 (4, 4) SHAKESPEARE. (a) The plays before 1600, (b) the plays of 1600 and later. Readings on the life of Shakespeare, the theater, and the acting company. May be taken singly.
- 473-4 MILTON.
- 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 workshop study in lectures, laboratory, conferences, to arrive at agreement on the teaching of English in high school. Curriculum, materials, methods, aims. Directed by competent authorities in the field.
- 487-2 to 8 WORKSHOP IN JUNIOR HIGH SCHOOL ENGLISH. Intensive workshop study in lectures, laboratory, conferences, to arrive at agreement on the teaching of English in junior high school. Curriculum, materials, methods, aims. Directed by competent authorities in the field.
- 492-8 (4, 4) PROFESSIONAL WRITING II. Must be taken in a,b sequence. Prerequisite: 392.
- 495-8 (4, 4) LITERARY CRITICISM. (a) History of literary criticism: ideas and techniques of criticism, from Aristotle to the end of the 19th century; (b) modern literary 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 4 hours may be taken in any one quarter.

- 500-2 Materials and Methods of Research in English.
 501-4 Old English Grammar.
 502-4 Beowulf.
 503-4 or 8 Studies in Linguistics.
 508-4 or 8 Studies in Chaucer.
 509-4 or 8 Studies in Middle English Literature.
 511-4 or 8 Studies in the Renaissance.
 513-4 or 8 Studies in Seventeenth Century English Literature.
 514-4 or 8 Studies in Restoration and Eighteenth Century Literature.
 519-4 or 8 Studies in Contemporary British Literature.
 520-4 or 8 Studies in Romantic Writers.
 521-4 or 8 Studies in Victorian Poetry.
 524-4 or 8 Studies in the Metaphysical Poets.
 532-4 or 8 Studies in American Transcendentalism.
 534-4 or 8 Studies in Early Nineteenth Century American Writers.
 536-4 or 8 Studies in Later Nineteenth Century American Writers.
 537-4 or 8 Studies in Twentieth Century American Writers.
 538-4 or 8 Problems in American Literature.
 543-4 or 8 Studies in Victorian Nonfiction Prose.
 555-4 or 8 Studies in the Victorian Novel.
 560-4 or 8 Studies in Renaissance Drama.
 566-4 or 8 Studies in Shakespeare.
 580-4 Traditional Themes.
 581a-4 Composition in High School.
 581b-4 Linguistics in High School.
 581c-4 Literature in High School.
 585-2 Teaching College Composition.
 586-4 to 8 Teaching College Literature.
 598-9 (1 to 3, 1 to 3, 1 to 3) Independent Review of English and American Literature.
 599-2 to 9 Thesis.
 600-1 to 48 Dissertation.

FOREIGN LANGUAGES

- Professors* Albert William Bork, Boyd G. Carter, J. Cary Davis (Acting Chairman),
 Hellmut A. Hartwig, Vera L. Peacock, Erich Wellner.
Associate Professors Mary Eileen Barry, Howard P. French, Joseph R. Kupcek, Made-
 leine M. Smith.
Assistant Professors Helmut Liedloff, Anna K. Neufeld.
Instructors Alice Anne Foley, J. A. LaFontaine, Gerda von Paleske, Robert Wasylus.
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- Visiting Professors* Jenaro J. Artiles, Luis Baralt.
Lecturer Arnold Ulner.
Assistant Instructors Daniele Kellams, Mildred O. Wilkinson.

SUGGESTED CURRICULA IN A LANGUAGE

BACHELOR OF ARTS DEGREE, COLLEGE OF LIBERAL ARTS AND SCIENCES

<i>General Studies Requirements</i> (See page 9.)	96
<i>Air Science Requirement</i> (See the General Information bulletin.)....	3
<i>College of Liberal Arts and Sciences Requirements</i> (See page 10.)	33
<i>Requirements for the Major in Foreign Languages</i>	42
A minimum of 42 hours in one language, in courses numbered above 200	
<i>Electives</i>	18
<i>Total</i>	<u>192</u>

BACHELOR OF SCIENCE IN EDUCATION DEGREE, COLLEGE OF EDUCATION

The curriculum leading to the Bachelor of Science in Education degree with a major in a language in the College of Education includes a minimum of 36 hours in the language, in courses numbered above 200. Other requirements for the degree are given in the College of Education bulletin.

MINOR

A minor consists of 24 hours in one language, in courses numbered above 200.

COURSE DESCRIPTIONS

Students taking work in any first year college foreign language series should note that the first two terms will not be counted as electives toward graduation unless the third term is also completed.

FOREIGN LANGUAGES

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.

CHINESE

120-3 (1, 1, 1) CHINESE CONVERSATION. Conversation and oral drill taken with GSD 120 by students who wish additional oral training: elected only by students enrolled in GSD 120.

201-15 (5, 5, 5) INTERMEDIATE CHINESE. Designed to give the students

a review of the Chinese language and its expansion, a reading ability of modern prose, and practice in conversation and composition. Must be taken in a,b,c sequence. Prerequisite: one year of college Chinese (GSD 120c) or equivalent.

FRENCH

- 123-3 (1, 1, 1) FRENCH CONVERSATION. Conversation and oral drill taken with GSD 123 by students who wish additional oral training: elected only by students enrolled in GSD 123.
- 161-0 FRENCH FOR GRADUATE STUDENTS. Intensive study of grammar and vocabulary. Designed for graduate students desiring a reading knowledge of French.
- 201-9 (3, 3, 3) INTERMEDIATE COMPOSITION AND READING. Composition, oral practice, rapid reading of modern authors. Must be taken in a,b,c sequence. Prerequisite: GSD 123c or two years of high-school French.
- 220-2 to 6 FRENCH CONVERSATION. Conversation based largely on topics of current interest chosen from French newspapers and reviews.
- GSC 305-3 CONTEMPORARY FRENCH DRAMA.
- 311-9 (3, 3, 3) SURVEY OF FRENCH LITERATURE. French literature from the beginning to the present time. Should be taken in a,b,c sequence. Prerequisite: 201c.
- 320-6 (2, 2, 2) ADVANCED CONVERSATION. Conversation based on French history. Should be taken in a,b,c sequence concurrently with 311 a,b,c.
- 351-8 (4, 4) ADVANCED COMPOSITION AND CONVERSATION. Oral and written practice for advanced students; intensive study of idiomatic expressions and current usage. Should be taken in a,b sequence.
- 352-5 FRENCH CONVERSATION AND PHONETICS. A thorough study of the phonetic alphabet and the formation of French sounds.
- 400-4 FRENCH LITERATURE BETWEEN 1870 and 1914. A survey. Prerequisite: 311c.
- 401-6 (3, 3) SEVENTEENTH CENTURY FRENCH DRAMA.
- 403-3 FRENCH LITERATURE OF THE EIGHTEENTH CENTURY. Drama and novel.
- 405-3 FRENCH CONTEMPORARY NOVEL. A study of the novel from 1900 to the present with detailed attention to Proust and Gide.
- 406-3 FRENCH POETRY FROM 1850 to 1900. The Parnassian and Symbolist Movements in French poetry.
- 407-3 FRENCH POETRY FROM 1900 TO THE PRESENT.
- 500-2 Seminar in Contemporary French Literature.
- 501-2 to 6 Seminar on a Selected French Author. (a) Balzac, (b) Baudelaire, (c) Moliere, (d) Montaigne, (e) Proust.
- 502-3 French Literature from La Chanson De Roland to Rabelais.
- 503-3 Rabelais and Montaigne.
- 504-3 La Pleiade.
- 507-3 A Study of Romanticism in France.
- 510-4 French Literature from 1850 to 1900.
- 511-3 Twentieth Century French Drama.

- 515-3 Old French.
520-4 Graduate Composition and Diction.
599-2 to 9 Thesis.

GERMAN

- 126-3 (1, 1, 1) GERMAN CONVERSATION. Conversation and oral drill taken with GSD 126 by students who wish additional oral training; elected only by students enrolled in GSD 126.
- 161-0 GERMAN FOR GRADUATE STUDENTS. Intensive study of grammar and vocabulary. Designed for graduate students desiring a reading knowledge of German.
- 201-9 (3, 3, 3) INTERMEDIATE GERMAN. Reading in modern prose, conversation, and composition. Must be taken in a,b,c sequence. Prerequisite: GSD 126c or two years of high-school German.
- 220-2 to 6 GERMAN CONVERSATION. Conversation based on topics of current interest. Extensive use of German newspapers, periodicals, and records. Prerequisite: consent of instructor.
- 301-8 (4, 4) SURVEY OF GERMAN LITERATURE TO 1800. Historical development of German literature. Should be taken in a,b sequence.
- 303-4 GERMAN "NOVELLE" IN THE NINETEENTH CENTURY. A study of representative works from 1800 to 1900, with emphasis on the literary movements of that time.
- 304-5 ADVANCED COMPOSITION AND CONVERSATION. Based on the history of German civilization. Required for prospective teachers of German.
- 311-8 (4, 4) INTRODUCTION TO GERMAN CLASSICAL LITERATURE. Lessing, Goethe, Schiller. Reading and discussion of representative works. May be taken in either sequence.
- 313-4 GERMAN DRAMA IN THE NINETEENTH CENTURY. Kleist, Grillparzer, Hebbel. Reading and discussion of representative works.
- 401-4 (2, 2) GOETHE'S FAUST. (a) The Faust legend and early Faust books and plays; the genesis of Goethe's *Faust*; reading of Part I. (b) Reading of Part II: study of symbolism such as blending of paganism with Christianity, ancient Greek culture with Germanic culture. Should be taken in a,b sequence.
- 403-3 GERMAN BALLADS AND LYRICS. A selective study of the foremost examples of German balladry and lyric poetry, ranging from the poetry of Klopstock and Bürger to that of Rilke and Werfel. Lectures, recitations.
- 404-4 WEIMAR AND ITS AFTERMATH. German writings from the inception of the Weimar Republic to the end of W.W. II, with special reference to the correlation existing between literary expression and social, economic, and political conditions.
- 406-3 THE GERMAN COMEDY. Comic and satirical works in German literature, with special emphasis on the "Lustspiel" since 1800. Lectures and reports.
- 407-2 GREAT GERMAN PLAYS OF THE 20TH CENTURY. Study and selective readings of outstanding stage successes. Lectures, and reports.
- 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, *Reichsdeutsche*, etc.), lectures, reports.

- 411-6 (3, 3) MIDDLE HIGH GERMAN. (a) Selective readings in such epics as the Nibelungen Lied and Gudrun. (b) The courtly epic poetry of such authors as Wolfram von Eschenbach, Gottfried von Strassburg, Hartmann von Aue, and the lyric poetry of Walther von der Vogelweide. May be taken in either sequence.
- 497-1 to 2 READINGS IN EIGHTEENTH-CENTURY GERMAN LITERATURE. Departmental approval required.
- 498-1 to 2 READINGS IN NINETEENTH-CENTURY GERMAN LITERATURE. Departmental approval required.
- 499-1 to 2 READINGS IN TWENTIETH-CENTURY GERMAN LITERATURE. Departmental approval required.
- 500-2 Seminar in Contemporary German Literature.
- 501-2 Seminar on a Selected German Author.
- 509-4 (2, 2) Old High German.
- 512-3 Nineteenth Century German Novel.
- 513-3 Twentieth Century German Novel.
- 514-3 Seminar in Folklore.
- 544-9 NDEA Summer Institute for Teachers of German.
- 591-2 to 6 Seminar on Kant.
- 511-3 to 9 Thesis or Research in German Literature.

GREEK

- 201-12 (4, 4, 4) INTERMEDIATE GREEK. Grammar review and composition. Readings from Plato. Must be taken in a,b,c sequence. Prerequisite: GSD 130c.
- 301-4 INTRODUCTION TO GREEK HISTORY. Reading and discussion of selections from the histories of Herodotus and Thucydides.
- 302-4 PLATO. Reading and discussion of the *Republic*.
- 303-4 ARISTOTLE. Reading and discussion of the *Ethics*.
- 311-8 (4, 4) INTRODUCTION TO HOMER. Reading and interpretation of selections from the *Iliad* and the *Odyssey*. Should be taken in a,b sequence.
- 313-4 INTRODUCTION TO GREEK TRAGEDY. Reading of at least two plays from the works of Aeschylus, Sophocles, and Euripides.
- GSC 320-3 GREEK LITERATURE IN TRANSLATION.
- GSC 330-3 CLASSICAL MYTHOLOGY.

LATIN

- 201-12 (4, 4, 4) INTERMEDIATE LATIN. Composition and reading from various authors. Should be taken in a,b,c sequence. Prerequisite: GSD 133 or two years of high-school Latin.
- 301-4 CICERO'S LETTERS. Emphasis laid upon the history of the times and the personality of Cicero.
- 302-4 VERGIL'S ECLOGUES AND GEORGICS. Vergil's spirit and contribution to Rome considered.
- 303-4 TACITUS. The *Agricola* and *Germania*.
- 304-2 PRIVATE LIFE OF THE ROMANS. Comprising a personal study of

the average family; housing, food, and clothing; marriage, education, amusements, slaves, and freedom; means of livelihood; death and burial.

Open to all students whether they have had Latin or not.

311-4 PHORMIO OF TERENCE. Prerequisite: 201c or equivalent.

312-4 HORACE'S ODES AND EPODES. Prerequisite: 201c or equivalent.

313-4 LETTERS OF PLINY. Prerequisite: 201c or equivalent.

326-4 OVID'S METAMORPHOSES.

GSC 331-3 LATIN LITERATURE IN TRANSLATION.

335-4 VERGIL'S AENEID.

342-4 ADVANCED COMPOSITION. A careful study based on classic prose-writers.

PORTUGUESE

100-5 INTRODUCTORY PORTUGUESE. Especially for Spanish majors and minors. Prerequisite: Spanish 201c or consent of instructor.

All 5 hours count toward a Spanish major of 42 hours or more. Only 3 hours count toward a Spanish minor, or a major of less than 42 hours.

ROMANCE PHILOLOGY

410-4 ROMANCE PHILOLOGY I. A survey of the phonology, morphology, and syntax changes in Romance languages in general; special attention to developments in French and Spanish for majors in these fields.

514-4 Romance Philology II.

515-4 Readings in Romance.

516-4 Arthurian Romance.

RUSSIAN

136-3 (1, 1, 1) RUSSIAN CONVERSATION. Conversation and oral drill taken with GSD 136 by students who wish additional oral training; elected only by students enrolled in GSD 136.

161-0 RUSSIAN FOR GRADUATE STUDENTS.

201-9 (3, 3, 3) INTERMEDIATE RUSSIAN. Reading of classical and modern prose, oral practice, composition. Must be taken in a,b,c sequence. Prerequisite: GSD 136c.

220-2 to 6 RUSSIAN CONVERSATION. Advanced conversation based on topics of current interest. Prerequisite: GSD 136c.

301-8 (4, 4) THE RUSSIAN NOVEL IN THE NINETEENTH CENTURY. Should be taken in a,b sequence.

308-9 (3, 3, 3) SURVEY OF RUSSIAN LITERATURE. Historical survey of major movements, authors, and works in Russian to the present time. Should be taken in a,b,c sequence. Prerequisite: 201c.

311-8 (4, 4) INTRODUCTION TO RUSSIAN CLASSICAL LITERATURE. Gogol, Pushkin, Turgenev, Tolstoy. Should be taken in a,b sequence.

313-4 RUSSIAN DRAMA IN THE NINETEENTH CENTURY. Griboyedov, Gogol, Pushkin, and minor dramatists.

320-2 READINGS IN RUSSIAN LITERATURE. Selected readings in areas not covered in regular course work.

330-6 (2, 2, 2) ADVANCED COMPOSITION AND CONVERSATION. Based

- on the history of Russian and the cultural heritage of the Russian people. Should be taken in a,b,c sequence concurrently with 308a,b,c.
- 414-3 RUSSIAN POETRY FROM ZHUKOVSKY TO 1920. A study of Russian poetry from Sentimentalism through Symbolism.
- 425-3 SOVIET LITERATURE SINCE 1917. A study of satirists and writers of everyday life. Constructivism and followers; Soviet literary criticism. Lectures, readings, and reports.
- 452-4 ADVANCED COMPOSITION AND CONVERSATION. Oral and written composition of a practical nature for advanced students; emphasis on study of idiomatic expressions and current usage.
- 509-3 Russian Literature of the 17th Century.
- 510-3 Russian Literature of the 18th Century.
- 514-4 (2, 2) History of the Russian Language.
- 520-4 Russian Linguistic Structure.
- 543-2 to 6 Research Problems.

SPANISH

- 140-3 (1, 1, 1) SPANISH CONVERSATION. Conversation and oral drill taken with GSD 140 by students who wish additional oral training: elected only by students enrolled in GSD 140.
- 161-0 SPANISH FOR GRADUATE STUDENTS. Intensive study of grammar and vocabulary. Designed for graduate students desiring a reading knowledge of Spanish.
- 201-9 (3, 3, 3) INTERMEDIATE SPANISH. Composition, oral practice, reading of modern authors. Must be taken in a,b,c sequence. Prerequisite: GSD 140c or two years of high-school Spanish.
- 220-2 to 6 SPANISH CONVERSATION.
- 311-9 (3, 3, 3) SURVEY OF SPANISH LITERATURE. The literature of Spain to the present. Should be taken in a,b,c sequence. Offered alternately with 333. Prerequisite: 201c.
- 316-3 CIVILIZACION ESPANOLA. A study of the cultural patterns and heritage of the Spanish people from earliest times to the present. Prerequisite: 315 or consent of instructor.
- 320-6 (2, 2, 2) ADVANCED COMPOSITION AND CONVERSATION. Required of majors and students preparing to teach. May be taken concurrently with 311 or 333.
- 333-9 (3, 3, 3) SURVEY OF SPANISH AMERICAN LITERATURE. Spanish literature in America from the conquest to modern times. Offered alternately with 311. Prerequisite: 201c.
- 351-3 ADVANCED COMPOSITION. Daily themes based on Spanish models, with free composition once a week. Class discussions.
- 360-2 to 8 TRAVEL-STUDY COURSE IN MEXICO. Lectures and course work at Mexican universities, in conjunction with the Latin American Institute's Study Abroad Program. Native professors and lecturers in Mexico City and other points visited. Individual projects and reports. Prerequisite: advanced standing in Spanish.
- 401-3 SPANISH NOVEL OF THE NINETEENTH CENTURY. Study of representative novels of Fernan Caballero, Valera, Pereda, Galdos, etc.
- 402-3 SPANISH DRAMA OF THE EIGHTEENTH AND NINETEENTH

- CENTURIES. Reading of representative plays of the chief dramatists from Moratin to the Generation of 1898.
- 403-3 SPANISH POETRY. General survey of Spanish poetry from its beginnings to 1900.
- 404-3 SPANISH LITERATURE OF THE TWENTIETH CENTURY: NOVEL AND ESSAY. Main trends of Spanish novel and essay since 1900.
- 415-3 SPANISH PHONETICS. Analysis of the sounds of Spanish and their manner of production; special drill in connected passages of prose and poetry.
- 421-3 SURVEY OF MODERNISM IN SPANISH AMERICAN POETRY. Study of its origins, characteristics, and achievements.
- 422-3 CONTEMPORARY SPANISH AMERICAN POETRY. Spanish American poetry since modernism.
- 423-3 to 4 THE MEXICAN NOVEL OF THE TWENTIETH-CENTURY. Emphasis on fiction dealing with the Revolution and related social problems.
- 424-3 to 4 GAUCHO LITERATURE. Study of the Gaucho as a social class and the types of literature developed to portray and symbolize his way of life, attitudes, and values.
- 426-3 THE MEXICAN SHORT STORY. Survey from pre-Conquest to the present.
- 427-3 SPANISH AMERICAN DRAMA. Study of representative works of Florencio Sanchez, Rodolfo Usigli, Armando Mook, Samuel Eichelbaum, Xavier Villaurrutia, and others.
- 440-6 (3, 3) THE GOLDEN AGE: DRAMA. Plays of Lope de Vega, Calderon, Tirso de Molina, Ruiz de Alarcon, and others. May be taken in either sequence.
- 445-4 CERVANTES. *Don Quixote*; Other works assigned as collateral readings.
- 478-4 SEMINAR IN LATIN AMERICAN THOUGHT. Investigation of research topics connected with Latin American thought during the nineteenth and twentieth centuries in the fields of government, social sciences, education, literature, and philosophy. Individual studies and reports. Prerequisite: consent of instructor.
- 500-2 Seminar in Latin American Literature.
- 501-2 Seminar on a Selected Spanish Author.
- 505-3 The Picaresque Novel.
- 506-3 The Renaissance.
- 513-3 Old Spanish.
- 520-3 Seminar in Syntax.
- 525-3 The Spanish Ballads.
- 535-3 Ensayistas Mexicanas del Siglo Diecinueve.
- 538-3 Seminar on Spanish American Poetry.
- 541-3 Seminar on Spanish American Literary Criticism.
- 543-2 to 6 Research Problems.
- 599-2 to 9 Thesis.

GEOGRAPHY

Professors Douglas B. Carter, Floyd F. Cunningham, Robert A. Harper (Chairman), Campbell Pennington.

Associate Professors David E. Christensen, Annemarie Krause, Marjorie Shank (Emerita, 1964), Frank H. Thomas.

Assistant Professors Theodore H. Schmudde, Howard A. Stafford, Jr.

Visiting Professor J. H. G. Lebon.

A student may take his work in the field of geography in either the College of Liberal Arts and Sciences or the College of Education:

1. In the College of Liberal Arts and Sciences geography majors prepare for careers in federal or local government research or planning. Today, more and more private businesses are utilizing trained geographers.
2. In the College of Education geography majors prepare to teach in the elementary or secondary schools, or with further preparation, in the junior colleges. Minors prepare to teach social science and earth and physical science in elementary or secondary schools.

Today a large number of geography majors take professional training beyond the bachelor's degree. Schools, colleges, and universities and government and business establishments, as well, are calling for persons with graduate training in geography.

SUGGESTED CURRICULA IN GEOGRAPHY

GSB 101a, Geography 302, 304, 306, and 308 make up a three-stage core for training in geography. GSB 101a gives a general survey of the viewpoint of geography. The second stage consists of 302, 304, and 306. Each of these courses gives the "elements" of understanding of a particular aspect of geography that all geographers must know. The third stage is 308. In it the various elements of physical, economic, and cultural geography are tied together, and the methods used by geographers in working with the complex of man-land associations in a particular area are shown. Geography 310 introduces the student to basic techniques used by geographers: maps and quantitative methods. Geography 490 offers the student an opportunity to work intimately with one of the staff members.

It is recommended that majors complete the core courses before taking other geography courses. After completing the core, the student may choose any other geography courses in assembling the hours required for his major. However, his program should be approved by a departmental adviser.

Minors and social studies field majors, too, are expected to take the core courses, for together these courses should offer the strongest basic preparation in geography.

Most upper division courses in geography consist of two-quarter sequences. Non-majors and minors may register for the first part of the sequence, but the second part is open only to majors and others who have consent of the instructor. Titles are general rather than specific. This is to provide the maximum flexibility in content. The specific content depends upon the instructor.

In physical, economic, and cultural geography there are two advanced sequences each. This is to enable the student wishing to specialize in one of these systematic fields to gain some degree of concentration. Thus, a student interested in one of these specific fields—say, physical geography—may take both sequences in advanced physical geography. A student not interested in such specialization will make his choices from the full range of systematic and regional sequences.

A broad background in other fields is of great importance to a geographer. Thus, it is recommended that geography majors hold their hours of geography to the minimum number required for the major and use their elective hours to take work in other departments. Students interested in physical geography should consider work in the departments of geology, botany, zoology, plant industries, forestry, and physics. Students interested in economic geography can profit from work in economics, agricultural industries, marketing, and transportation. Students specializing in cultural geography will find courses in sociology, anthropology, community development, history, and government particularly useful. Students interested in the geography of a particular area of the world are encouraged to take courses on the area in other departments. Programs of the Latin American Institute and the committees on Asian, Russian, and central European studies are particularly noted.

BACHELOR OF ARTS DEGREE, COLLEGE OF LIBERAL ARTS AND SCIENCES

<i>General Studies Requirements</i> (See page 9.)	96
<i>Air Science Requirement</i> (See the General Information bulletin.)	3
<i>College of Liberal Arts and Sciences Requirements</i> (See page 10.)	33
<i>Requirements for the Major in Geography</i>	39
General Studies Area B 101a	(3)
Geography 302, 304, 306, 308, 310-6, 490-3	24
Geography electives to complete 42 hours	15
<i>Electives</i>	21
A background in statistical analysis is recommended.	
<i>Total</i>	192

BACHELOR OF SCIENCE IN EDUCATION DEGREE, COLLEGE OF EDUCATION

The curriculum leading to the Bachelor of Science in Education degree with a major in geography in the College of Education includes the following *Requirements for the Major*:

General Studies Area B 101a (counts toward the major)	(3)
General Studies Area D One year of a foreign language	(9)
Geography 302, 304, 306, 308, 310-7, 490-3	24
Geography electives to complete 48 hours (Only 42 hours are required for the major if two 24-hour minors are presented; only 36 hours are required if one other 48-hour major is presented.)	21

A background in statistical analysis is recommended. Other requirements for the degree are given in the College of Education bulletin.

COURSE DESCRIPTIONS

- 300-4 WORLD CULTURAL GEOGRAPHY. World survey for students in other departments. The factors of population distribution. Not open to those who have had GSB 101a.
- 302-4 INTRODUCTION TO PHYSICAL GEOGRAPHY. Study of the nature of the earth's landforms, climate, water resources, natural vegetation, and soils with particular emphasis on their areal differences and distribution. Their relationships to each other and their importance to man are also considered. Prerequisite: GSB 101a.
- 304-4 INTRODUCTION TO ECONOMIC GEOGRAPHY. Study of the spatial distribution and interaction of economic activities. Introduction to locational theory. Prerequisite: GSB 101a.
- 306-4 INTRODUCTION TO CULTURAL GEOGRAPHY. An overview of the geographic viewpoint in the study of the human occupation of the earth. Aspects of population, settlement, and political geography are treated, and a generalized survey of major world cultural areas is used to integrate course elements. Prerequisite: GSB 101a.
- 308-3 INTRODUCTION TO GEOGRAPHIC METHODS. Methods of integrating physical, economic, and cultural elements in the study of areas. Focus on generalizations concerning selected areas of varying magnitude and character. Cartographic and quantitative techniques utilized. Prerequisites: 302, 304, 306.
- 310-7 (4, 3) INTRODUCTION TO CARTOGRAPHIC METHODS. Studies of properties of maps and air photos, their uses and sources. Maps as means of expression in scientific investigation. Introduction to the use of quantitative techniques as applied in geographic study. Laboratory. Prerequisite: GSB 101a.
- 324-4 RESTORATION AND CONSERVATION OF NATURAL RESOURCES. Survey of major resources of United States with stress on problems of conservation and restoration. Emphasis on water, mineral, forest, grass,

- soil, wildlife, scenic, and recreational resources. Field trips. Prerequisite: GSB 101a or consent of instructor.
- 343-4 TEACHING OF GEOGRAPHY. Presentation and evaluation of methods of teaching geography. Emphasis upon geographic literature, illustrative materials, and teaching devices suitable to particular age levels. Prerequisite: GSB 101a.
- 387-2 to 4 HONORS IN GEOGRAPHY. Supervised research and investigation in different branches of geography. Open to students in the honors program.
- 402-7 (4, 3), 403-7 (4, 3) ADVANCED PHYSICAL GEOGRAPHY I, II. 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 on familiarizing the student with techniques of analysis and on developing concepts and principles that underlie understanding of the phenomena and their geographic significance. Prerequisites: 302 or consent.
- 404-7 (4, 3), 405-7 (4, 3) ADVANCED ECONOMIC GEOGRAPHY I, II. Deals with one or more of the following: transportation, manufacturing, agriculture, resources, trade and urban geography; depending on and varying with, interests of the instructors. Thus, a student may register more than one time. Emphasis on familiarizing the student with techniques of analysis and on developing concepts and principles that underlie understanding of the phenomena and their geographic significance. Prerequisite: 304 or consent.
- 406-7 (4, 3), 407-7 (4, 3) ADVANCED CULTURAL GEOGRAPHY I, II. 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 on familiarizing the student with techniques of analysis, and on developing concepts and principles that underlie understanding of the phenomena and their geographic significance. Prerequisite: 306 or consent.
- 410-8 (4, 4) ADVANCED GEOGRAPHIC TECHNIQUES. Geographic applications of cartographic and quantitative research techniques. Prerequisite: 310 or consent of instructor.
- 416-8 (4, 4) ADVANCED CARTOGRAPHY. Instruction and practice in the basic techniques of map-making and analysis; consideration and solution of problems involved in the construction of large, medium, and small scale maps; problems in map reproduction.
- 440-2 to 6 READING FOR MAJORS. Supervised readings in selected subjects. Prerequisite: advanced standing.
- 461-7 (4, 3) ADVANCED REGIONAL GEOGRAPHY: ANGLO-AMERICA. Deals geographically with present-day United States and Canada. (a) a general survey of the area, open to non-majors; (b) investigation of specific topics in depth, for majors. Must be taken in a,b sequence. Prerequisite: 308 or consent of department.
- 462-7 (4, 3) ADVANCED REGIONAL GEOGRAPHY: EUROPE. Deals geographically with present-day Europe. (a) a general survey of the area, open to non-majors; (b) investigation of specific topics in depth, for majors. Must be taken in a,b sequence. Prerequisite: 308 or consent.

- 463-7 (4, 3) ADVANCED REGIONAL GEOGRAPHY: MEDITERRANEAN LANDS AND SOUTHWESTERN ASIA. Deals geographically with present-day Mediterranean Lands & Southwestern Asia. (a) a general survey of the area, open to non-majors; (b) investigation of specific topics in depth, for majors. Must be taken in a,b sequence. Prerequisite: 308 or consent of department.
- 464-7 (4, 3) ADVANCED REGIONAL GEOGRAPHY: SOVIET WORLD. Deals geographically with present-day Soviet World. (a) a general survey of the area, open to non-majors; (b) investigation of specific topics in depth, for majors. Must be taken in a,b sequence. Prerequisite: 308 or consent of department.
- 465-7 (4, 3) ADVANCED REGIONAL GEOGRAPHY: SUBSAHARAN AFRICA. Deals geographically with present-day Sub-Saharan Africa. (a) a general survey of the area, open to non-majors; (b) investigation of specific topics in depth, for majors. Must be taken in a,b sequence. Prerequisite: 308 or consent of department.
- 466-7 (4, 3) ADVANCED REGIONAL GEOGRAPHY: EASTERN AND SOUTHERN ASIA. Deals geographically with present-day Eastern & Southern Asia. (a) a general survey of the area, open to non-majors; (b) investigation of specific topics in depth, for majors. Must be taken in a,b sequence. Prerequisite: 308 or consent of department.
- 467-7 (4, 3) ADVANCED REGIONAL GEOGRAPHY: LATIN AMERICA. Deals geographically with present-day Latin America. (a) a general survey of the area, open to non-majors; (b) investigation of specific topics in depth, for majors. Must be taken in a,b sequence. Prerequisite: 308 or consent of department.
- 468-7 (4, 3) ADVANCED REGIONAL GEOGRAPHY: OCEANIA. Deals geographically with present-day Oceania. (a) a general survey of the area open to non-majors; (b) investigation of specific topics in depth, for majors. Must be taken in a,b sequence. Prerequisite: 308 or consent of department.
- 470-12 (4, 4, 4) URBAN PLANNING. (470a is same as Government 470.) An interdepartmental course in the basic problems of planning in the urban community. Includes the administrative and physical principles involved in the planning of urban land use. Emphasis upon research techniques, design principles, and governmental instrumentalities in the planning process. Must be taken in a,b,c sequence. Prerequisite: 308 or consent of instructor.
- 471-7 (4, 3) REGIONAL PLANNING. Examination of the viewpoint, methods, and techniques of regional planning. Must be taken in a,b sequence. Prerequisite: consent of instructor.
- 480-4 WORKSHOP IN THE TEACHING OF GEOGRAPHY. (not open to those with credit in 343) Gives the geographic approach to man in space. Skills, techniques in the use of maps, globes, pictures, statistics and graphics, and reading the landscape and literature will be acquired. Prerequisite: GSB 101a.
- 490-3 (1, 1, 1) TUTORIAL IN GEOGRAPHY. Regular individual and small group conferences with staff members to examine geographic concepts.
- 500-4, 501-4 Geographic Techniques I, II.
- 511-4 Philosophy of Geography.

- 514-2 Teaching of College Geography.
 515-4 to 6 Field Course.
 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.
 540a-2 to 12 Research in Physical Geography.
 540b-2 to 12 Research in Economic Geography.
 540c-2 to 12 Research in Regional Geography.
 540d-2 to 12 Research in Cultural Geography.
 599-3 to 9 Thesis.

GEOLOGY

Professors Fred Donald Bloss, Stanley E. Harris, Jr. (Chairman).
Associate Professors Daniel N. Miller, Jr., David Nicol.
Assistant Professors Dewey Harold Amos, Frank James Bell, Jen-Ho Fang.

SUGGESTED CURRICULUM IN GEOLOGY

BACHELOR OF ARTS DEGREE, COLLEGE OF LIBERAL ARTS AND SCIENCES

<i>General Studies Requirements</i> (See page 9.)	87
<i>Air Science Requirement</i> (See the General Information bulletin.)	3
<i>College of Liberal Arts and Sciences Requirements</i> (See page 10.)	33
<i>Requirements for the Major in Geology</i>	75
General Studies Area D 114-9	(9)
Chemistry 111-15	15
Geology 220, 221, 302, 310, 405, 425a, 431	30
Geology 311, 312, 315, 425b, 425c (any 3)	12
Geology electives to complete 50 hours	8
Mathematics 150a	5
Physics	5
<i>Total</i>	198

A summer field course in geology should be taken between junior and senior years. Additional work in chemistry, mathematics, physics, or biology may be necessary to support specialities. It is recommended that students majoring in geology should minor in chemistry, mathematics, physics, or zoology. A minor in some other area should be approved by the department.

Preparations for a professional career usually require graduate study.

MINOR

A minor in geology consists of 24 hours determined by consultation with the department's major adviser.

COURSE DESCRIPTIONS

- 220-5 PHYSICAL GEOLOGY. A study of the principal minerals and rocks of the earth's crust, emphasizing origin and identification; the physical processes active in producing the surface features of the earth. Laboratory and field trips required.
- 221-5 HISTORICAL GEOLOGY. Presenting in chronological order the procession of physical and biotic changes through which the earth has passed. Includes the physical history and evolution of life forms as evidenced by fossil records. Laboratory. Prerequisite: 220 or consent of instructor, elementary course in zoology or botany recommended.
- 302-4 STRUCTURAL GEOLOGY. A study of the forces involved in the deformation of the earth's crust, with special emphasis on the recognition, interpretation, and illustration of the resultant geologic structures. Laboratory. Prerequisite: 220, 221.
- 310-4 CRYSTALLOGRAPHY. The study of morphological crystallography including crystal symmetry, Hermann-Mauguin symbolism for the crystal classes, and solution of problems by means of the stereographic projection. Prerequisite: Trigonometry.
- 311-4, 312-4 DETERMINATIVE MINERALOGY. A study of nonsilicate and silicate minerals including the influence of crystal chemistry upon their physical and chemical properties. Laboratory practice in chemical determination and sight identification. Prerequisites: 310, Chemistry 111b (concurrently).
- 315-4 PETROLOGY. A study of the characteristics and classification of rocks, their origin and geologic distribution. Laboratory. Prerequisite: 220.
- 320-4 ECONOMIC GEOLOGY. Study of the world's larger mining districts and the economics and political importance of their geological resources.
- GSA 321-3 INTRODUCTION TO PALEONTOLOGY.
- 405-3 GEOLOGIC INTERPRETATION OF MAPS AND AIR PHOTOS. Interpretation and use of air photos in geologic mapping; interpretation and construction of geologic maps, such as areal, structure, isopach, paleogeologic. Laboratory. Prerequisites: 221, 302, 431.
- 410-4 STRATIGRAPHY AND SEDIMENTATION. The features of sedimentary rocks and their processes of origin and diagenesis; the classification of stratigraphic units, methods of correlation, and paleogeologic reconstruction. Laboratory. Prerequisites: 220, 221.
- 414-5 PALEOBOTANY (See Botany 414.)
- 415-4 OPTICAL MINERALOGY. The optical properties of minerals and the use of the petrographic microscope for identification by the immersion method and by thin section. Laboratory. Prerequisite: 310.
- 416-4 X-RAY CRYSTALLOGRAPHY. Identification of unknown crystalline materials and determination of lattice parameters by X-ray techniques. Prerequisite: 310 or consent of instructor.

- 420-9 (3, 3, 3) GEOLOGY OF PETROLEUM. Geological occurrence of petroleum, including origin, migration, and accumulation; a study of exploration tools and methods: (a) study and interpretation of logs and applications of other tools, (b) study and application of subsurface information, (c) study of subsurface cuttings, correlation with other data. Laboratory and field trips and written reports required. Must be taken in a,b,c sequence. Prerequisites: 221, 302.
- 425-13 (5, 4, 4) PALEONTOLOGY. Study of the invertebrates and their fossil representatives. Includes classification, evolution, paleoecology, and geographic and stratigraphic distribution. (a) Important invertebrate phyla and their fossil representatives; (b) the mollusca, arthropoda, brachiopoda, and echinodermata; (c) the protozoa, porifera, coelenterata, bryozoa, and other minor groups. Must be taken in a,b,c sequence. Prerequisite: 221.
- 430-4 PHYSIOGRAPHIC PROVINCES OF NORTH AMERICA. (Same as Geography 430.) Designed to give the student an intelligent appreciation of the evolution of land forms in the physiographic provinces of North America; to explain the surface features in a landscape; and to interpret the human drama related thereto. Prerequisite: 220 or GSB 101a.
- 431-4 GEOMORPHOLOGY. A study of land forms, relating topographic features to the underlying rocks and structure and to processes of erosion, deposition, and earth movements. Prerequisite: 220 or GSB 101a.
- 440-1 to 4 INDEPENDENT STUDY. Prerequisites: 220, 221, advanced standing.
- 450-9 FIELD GEOLOGY. A field mapping course including problems in stratigraphy, structure, paleontology, physiography, and economic geology. Requires a written geologic report. Consult departmental office for dates, cost, and equipment needed. Prerequisite: 302.
- 510-9 (3, 3, 3) Stratigraphy (Paleozoic, Mesozoic, Cenozoic).
- 515-12 (4, 4, 4) Mineral Deposits (Principles, Metallics, Non-Metallics).
- 520-12 (4, 4, 4) Advanced Petrology (Igneous, Metamorphic, Sedimentary).
- 528-3 Introduction to Micropaleontology.
- 540-1 to 9 Advanced Studies.
- 541-1 to 9 Research.
- 599-2 to 9 Thesis.

GOVERNMENT

Research Professor Rexford Guy Tugwell.

Professors Abdul Abbass, Orville Alexander (Chairman), Jack F. Isakoff, Horace B. Jacobini, Frank L. Klingberg, Robert A. McGrath, Ward M. Morton, David Carson Scott, Willis G. Swartz, Max Wesley Turner, William O. Winter.

Associate Professors Earl Hanson, Irving Howards, David T. Kenney, Randall H. Nelson, John S. Rendleman, Marian E. Ridgeway, M. M. Sappenfield.

Assistant Professors Ikua Chou, William Hardenbergh, Egon Kamarasy, Elmo M. Roberts.

Instructors Rino Bianchi, David Frier.

Visiting Professors Clarence A. Berdahl, Frederick H. Guild.

Lecturer Manfred Landecker.

An undergraduate major for a student in the College of Liberal Arts and Sciences consists of 36 hours, and 42 hours for a student in the College of Education. A major or minor is recommended for persons planning to teach civics or government courses, and for those planning to qualify for the study of law or for public service. Students majoring in government are urged to take as much work as possible in other social science departments, with at least one minor in a related field. Students planning to take graduate work in government beyond the master's degree should acquire a reading knowledge of both French and German.

Government majors and minors should meet the second-level requirement in GSB by taking GSB 201-9. Such students should then begin their work in government with Government 231 and 232, which are basic courses and prerequisites for many more advanced courses. Majors and minors may, however, take GSB 211-9; in this case they are not permitted to take Government 231 but may take 232.

SUGGESTED CURRICULA IN GOVERNMENT

BACHELOR OF ARTS DEGREE, COLLEGE OF LIBERAL ARTS AND SCIENCES

<i>General Studies Requirements</i> (See page 9.)	96
<i>Air Science Requirement</i> (See the General Information bulletin)	3
<i>College of Liberal Arts and Sciences Requirements</i> (See page 10.)	33
<i>Requirements for the Major in Government</i>	42
GSB 201-9	(9)
Government 231 (or GSB 211b,c), 232	10
Government electives to total at least 42 hours, preferably according to one of three recommended sequences:	32
305, 360, 379, 380, 462, 471, 472, 495-8, GSB 303, 390, 392	(44)
Specialization in International Affairs: 243, 371, 453, 456, 457, 458, 459, 460, 471, 472, 475, 480, GSB 303, 385, 390	(55)
Specialization in Public Administration: 305, 315, 340, 360, 410, 420, 432, 434, 435, 436, 438, 440, 461, 462, 463, 464, 466, 467, 468, 469, 470, 495	(77)
<i>Electives</i>	18
<i>Total</i>	192

BACHELOR OF SCIENCE IN EDUCATION DEGREE, COLLEGE OF EDUCATION

The curriculum leading to the Bachelor of Science in Education degree with a major in government includes 36 hours selected from the following:

Government 231, 232, 243, 305, 315, 330, 360, 371, 379, 380, 420, 466, 467, 472, 495, GSB 385, 390

Other requirements for the degree are given in the College of Education bulletin.

MINOR

A minor is 24 hours, in either college.

COURSE DESCRIPTIONS

- 231-5 AMERICAN NATIONAL GOVERNMENT. A survey covering the structure, functions, and principles of national government. Also meets social science and American government requirements.
- 232-5 STATE AND LOCAL GOVERNMENT. A survey of the structure and functions of American state and local government.
- 300-4 AMERICAN GOVERNMENT. An advanced course to satisfy the American government requirements of the College of Education. Deals with the structure and functions of national, state, and local government. Not open to those who have had 231 or GSB 211b.
- GSB 303-3 INTERNATIONAL RELATIONS.
- 305-5 DEVELOPMENT OF THE AMERICAN CONSTITUTION. The evolution of the United States constitutional system. Recommended for pre-law students. Prerequisite: 231.
- 315-3 ADMINISTRATION OF JUSTICE. The organization and work of the American judicial system. Recommended for prelaw students. Prerequisite: 232.
- 321-1 to 6 READINGS IN GOVERNMENT. Consent of instructor required.
- 330-2 ILLINOIS GOVERNMENT. The development and functioning of government in Illinois. Prerequisite: 232.
- 340-3 THE LEGISLATIVE PROCESS. A study of the principles, organization, and work of American legislative bodies. Prerequisite: 231.
- GSB 345-3 INTRODUCTION TO AMERICAN FOREIGN POLICY. An introductory course dealing with the significance of foreign policy to American citizens.
- 360-5 PUBLIC ADMINISTRATION. Principles and problems of administration on the national, state, and local level. Prerequisite: 231.
- 361-3 PROBLEMS IN PUBLIC ADMINISTRATION AND POLICY FORMATION. A study of various problems in public administration and policy, primarily as they appear in actual case situations. This course is designed for those who do not intend to concentrate in public administration. Prerequisite: 360 or consent of instructor.
- 363-3 UNITED STATES-LATIN AMERICAN RELATIONS. A study of the governmental relations between the United States and the various nations of Latin America. Prerequisite: 231.
- 371-3 PROBLEMS OF AMERICAN FOREIGN POLICY. An analysis of selected problems in the field of American foreign policy. Prerequisite: 231 or 243.
- 379-3 POLITICAL PARTIES II. A study of the historical development of American political parties. Prerequisite: 231 or 232.

- 380-3 POLITICAL PARTIES. The development and work of American political parties. Prerequisite: 231 or 232.
- GSB 385-3 CONTEMPORARY POLITICAL ISMS.
- GSB 390-3 INTRODUCTION TO COMPARATIVE GOVERNMENT.
- GSB 392-3 INTRODUCTION TO LATIN AMERICAN GOVERNMENT AND POLITICS.
- 398-3 GOVERNMENT AND LAW. Techniques of law (classification, rights, and duties). Legal personality, public law and private law, criminal law, juristic acts. Property, possession and procedure. Prerequisite: 231.
- 406-4 THE AMERICAN CHIEF EXECUTIVE: PRESIDENT AND GOVERNOR. A study of the origin and background of the presidency and the governorship, qualifications, nomination and election, succession and removal, the organization of the executive branch, and the powers and functions of the president and governor. Prerequisites: 231 and 232.
- 410-3 LABOR AND POLITICS. A political history of the American labor movement from its early nineteenth-century origins to the present day. Attention is given to the political philosophy and practice of labor unions. Prerequisite: 231.
- 415-3 POLITICAL BEHAVIOR. An analysis of the nature of public opinion and methods of influencing political behavior. Major attention given to studying the basic psychological attitudes and behavior. Prerequisite: 231.
- 420-3 PRESSURE GROUPS AND POLITICS. An analysis of interest groups and their techniques of political propaganda. Prerequisite: 231.
- 430-3 GOVERNMENT AND NATIONAL SECURITY. A study of the organization of government for national security, the historical and current developments in civil-military relations, the legal status of military organizations, scientific developments in military affairs, overseas military aid programs, international defense programs, and the problems of disarmament. Prerequisite: 231 or consent of instructor.
- 432-3 GOVERNMENT AND NATURAL RESOURCES. A study of the administrative and policy problems in the development of multiple purpose conservation programs by the national government. Prerequisite: 231 or consent of instructor.
- 434-3 GOVERNMENT AND AGRICULTURE. A historical and contemporary survey of the role of agriculture in politics, the major and minor farm parties and pressure groups, the elements of the current "farm problem," and the influence of agriculture in public agencies and the formation of public policy. Prerequisite: 231.
- 435-4 GOVERNMENT AND BUSINESS. A historical study, with contemporary emphasis upon relations between government and economic institutions. Prerequisite: 231 or consent of instructor.
- 436-3 GOVERNMENT AND LABOR. (Same as Economics 436.) A study of labor relations and legislation considering both constitutional and economic aspects. Prerequisite: 231, GSB 211a, or consent of the instructor.
- 438-4 SOCIAL WELFARE LEGISLATION. The Social Security Act and other legislation of major significance for the welfare and maintenance of the family, the handicapped, children, and other special groups. Their relationship to the legal structure of federal, state, county, township, and municipal welfare facilities and institutions with indications of economic and social consequences. Prerequisite: 231 or consent of instructor.
- 440-4 PUBLIC PERSONNEL ADMINISTRATION. A survey of the methods

- and functions of modern public personnel administration. Prerequisite: 360.
- 441-4 PHILOSOPHY OF POLITICS. (Same as Philosophy 441.) Some of the central problems of modern political life, such as sovereignty, world government, authority and consent, the relations of economics and social studies to political theory. Prerequisite: GSC 102 or 340 or consent of instructor.
- 452-4 GOVERNMENTS AND POLITICS OF SUB-SAHARA AFRICA. A study of the governments and politics of the former and present British and French territories: Ghana, Nigeria, Kenya, Guinea, Congo, Senegal, etc. Prerequisite: GSB 390 or consent of instructor.
- 453-4 SOVIET RUSSIA AND THE COMMUNIST STATES OF EASTERN EUROPE. An intensive study and research exercise in the government and politics of the Soviet Union. Prerequisite: GSB 390 or consent of instructor.
- 454-8 DEVELOPMENT OF GERMAN DEMOCRACY. Offered co-operatively by Southern Illinois University and the University of Hamburg. Involves a summer's residence in Hamburg, Germany, and study under professors of the two co-operating universities. Prerequisite: consent of the American professor.
- 455-4 MAJOR GOVERNMENTS OF WESTERN AND CENTRAL EUROPE. A comparative study of the political systems of the major countries of western and central Europe. Prerequisite: GSB 390 or consent of instructor.
- 456-4 GREAT BRITAIN AND THE BRITISH EMPIRE. A survey of the governmental institutions and practices within the British Empire, with particular attention to the political systems of Australia, Canada, and South Africa. (The governments of India and Pakistan are treated in 460.) Prerequisite: GSB 390 or consent of instructor.
- 457-8 (4, 4) GOVERNMENT AND POLITICS IN THE NEAR AND MIDDLE EAST. Iran, Iraq, Syria, Lebanon, Egypt, Jordan, Saudi Arabia, etc. Prerequisite: 390 or consent of instructor.
- 458-4 GOVERNMENT AND POLITICS OF SOUTHEAST ASIA. Burma, Thailand, Malaya, Indo-China, Indonesia, Philippines. Prerequisite: GSB 390 or consent of instructor.
- 459-4 GOVERNMENT AND POLITICS OF THE FAR EAST. China, Japan, Korea, Formosa. Prerequisite: GSB 390 or consent of instructor.
- 460-4 GOVERNMENT AND POLITICS OF SOUTH ASIA. India, Pakistan, Ceylon. Prerequisite: GSB 390 or consent of instructor.
- 461-4 THEORY OF PUBLIC ADMINISTRATION. Analysis of various theoretical approaches to public administration with emphasis on recent American literature in this field. Prerequisite: 360 or consent of instructor.
- 462-3 ADMINISTRATIVE ORGANIZATION. A survey of the reorganization movement as a whole in the United States with emphasis on recent national, state, and local developments. Prerequisite: 360 or consent of instructor.
- 463-3 GOVERNMENT SOCIAL AND ECONOMIC POLICY. Exploration of contemporary agencies of policy-determination within the national government; attention to methods and devices utilized to effectuate national social and economic policy within the Federal system; appraisal of historical developments, trends, and results as they affect American govern-

- mental, Constitutional, and political philosophy; public administration; and the general welfare. Prerequisite: 231 and 360, or consent of instructor.
- 464-3 REGULATORY ADMINISTRATION. A study of the work of the major regulatory commissions of the national government. Prerequisite: 360 or consent of instructor.
- 466-3 STATE GOVERNMENT AND ADMINISTRATION. Leading problems of government and administration of American states. Prerequisite: 232.
- 467-4 MUNICIPAL GOVERNMENT AND ADMINISTRATION. Development and functioning of city government in the United States. Prerequisite: 232.
- 468-3 COUNTY GOVERNMENT IN THE UNITED STATES. An examination of the traditional rural county and township, the growing number of metropolitan counties, and the associated growth of special districts in the United States. Prerequisite: 232.
- 469-3 ADMINISTRATION OF STATE AND LOCAL FINANCE. An examination of the administrative problems connected with local and state revenues and expenditures in the United States. Prerequisite: 232.
- 470-4 URBAN PLANNING. (See Geography 470a.)
- 471-4 THE ORGANIZATION AND ADMINISTRATION OF AMERICAN FOREIGN POLICY. An advanced course. Prerequisite: 243 or 371.
- 472-4 INTERNATIONAL GOVERNMENT. Development and organization of international governmental and administrative systems, with emphasis on the United Nations. Prerequisite: GSB 303.
- 475-4 INTERNATIONAL LAW. Rules and practices governing the nations in their relations in peace and war. Prerequisite: GSB 303.
- 478-4 INTERNATIONAL POLITICS. A study of the interplay of political forces in the international community. Particular emphasis will be placed on war-time diplomacy, peace treaties, the alignments and conflicts of power in the post-war period. Prerequisite: GSB 303 or consent of instructor.
- 480-4 THE PACIFIC AND THE FAR EAST. Political and strategic problems in this area. Prerequisite: 303 or History 367b.
- 484-8 (4, 4) HISTORY OF POLITICAL THEORIES. (a) Political theories of the ancient and medieval periods including those of Aristotle, Plato, Cicero, St. Augustine, and Thomas Aquinas; (b) political theories from the Renaissance to the end of the eighteenth century including those of Machiavelli, Hobbes, Rousseau, Locke, and Burke. Prerequisite: 6 hours of government.
- 485-4 RENAISSANCE AND RATIONALISTS POLITICAL THEORIES. Important political theories from the Renaissance to the end of the eighteenth century, including the theories of Machiavelli, Hobbes, Rousseau, Locke, and Burke. Prerequisite: 6 hours of government.
- 487-4 AMERICAN POLITICAL IDEAS. A historical study of the political ideas of leading American statesmen and publicists, and their resulting influence upon our governmental system. Prerequisite: 305 or GSB 385.
- 488-9 (3, 3, 3) RECENT POLITICAL THEORY. (a) The outstanding Anglo-American liberal political theorists from John Stuart Mill to the present; (b) the outstanding "scientific" political theorists from Karl Marx to the present; (c) the outstanding idealistic and nationalistic political theorists from Hegel to the present. Prerequisites: 305, GSB 385.

- 495-8 (4, 4) CONSTITUTIONAL LAW. Emphasis on cases dealing with the framework of American (a) federal system, and (b) liberties. Prerequisite: 231.
- 497-4 ADMINISTRATIVE LAW. Law as it affects public officials in carrying out the rights, duties, and necessary functions of the public office. Prerequisite: 360.
- 498-4 JURISPRUDENCE. (Theories of Law.) Major schools in legal thinking. Positive law and natural law. Idea of justice and concept of natural rights. Prerequisite: 231.
- 499-4 RESEARCH METHODS. Practical training in research and writing techniques in the field of government. Bibliographical materials, footnotes, use of law library facilities, and government documents. Required of all beginning graduate students.
- 501-2 to 9 Seminar in Contemporary Legislation.
- 502-2 to 9 Seminar in Governmental Problems.
- 503-2 to 9 Seminar in Pressure Groups.
- 505-2 to 9 Seminar in Political Parties.
- 508-2 to 9 Seminar in International Relations.
- 509-2 to 9 Seminar in International Organization.
- 510-2 to 9 Seminar in State Government.
- 511-2 to 9 Seminar in Local Government.
- 512-2 to 9 Seminar in Public Administration.
- 513-2 to 9 Seminar in Constitutional Law.
- 515-2 to 9 Seminar in Comparative Constitutions.
- 516-2 to 9 Seminar in Municipal Administration.
- 517-2 to 9 Seminar in Problems in Political Theory.
- 520-2 to 9 Seminar in American Foreign Policy.
- 521-1 to 12 Readings.
- 525-2 to 9 Seminar in International Law.
- 526-2 to 9 Seminar in County Government.
- 530-4 to 12 Internship in Public Affairs.
- 595-2 to 12 Individual Research.
- 598-1 Teaching Government.
- 599-2 to 9 Thesis.
- 600-1 to 48 Dissertation.

HEALTH SCIENCE

Students in the College of Liberal Arts and Sciences may major in health science. This program is interdepartmental. Professor Willard M. Gersbacher of the Department of Zoology is the co-ordinator for this program.

SUGGESTED CURRICULUM IN HEALTH SCIENCE

BACHELOR OF ARTS DEGREE, COLLEGE OF LIBERAL ARTS AND SCIENCES

General Studies Requirements (See page 9.)

<i>Air Science Requirement</i> (See the General Information bulletin.) ..	3
<i>College of Liberal Arts and Sciences Requirements</i> (See page 10.)	9
The health science curriculum includes the major and minor.	
<i>Requirements for the Major in Health Science</i>	87
GSA 201-9, 301	(13)
GSB 201-9, 211-9	(9) + 9
GSD 108-9, and 123-9 or 126-9 ¹	(18)
GSE 201	(3)
Chemistry 111a,b, 305a	14
Government 232, 360, 440	14
Health Education 300, 325, 355, 356	15
Microbiology 301	5
Psychology 305, 307, 432	12
Sociology 335, 336	8
Zoology 102, 103	10
<i>Electives</i>	6
<i>Total</i>	192

Recommended electives for specialization in sanitation: Microbiology 422, 423; Agricultural Industries 303; Animal Industries 231; Government 466; Physics 206-15; Zoology 306 or 316, 310, 406.

Recommended electives for specialization in public health laboratory: Chemistry 235, 451a,b; Government 466; Microbiology 403, 422, 423, 425; Physiology 315c, 433; Zoology 306 or 316.

There is no minor in Health Science.

HISTORY

Research Professor C. Harvey Gardiner.

Professors George W. Adams (Chairman), Harold E. Briggs, Ping-chia Kuo.

Associate Professors Harry Ammon, George L. Cherry, Betty Fladeland, William A. Pitkin, John I. Wright (Emeritus, 1963).

Assistant Professors Howard Allen, Sanford Elwitt, Donald R. Kelley, Lonnie R. Shelby, Dan Silverman.

Instructor Edward O'Day.

Students who intend to make history their major field should confer with a representative of the department at the time of registration. Forty-eight hours are required for a major in history either in the College of Liberal Arts and Sciences or the College of Education. Students should be careful to elect approximately the same number of 400-level as of 300-

¹Health science majors should elect a year of either French or German. Other languages may be substituted by special permission only.

level hours in the major, and care should also be taken to distribute the work in the various fields of history. One year of acceptable work in a foreign language is required of history majors.

SUGGESTED CURRICULUM IN HISTORY

BACHELOR OF ARTS DEGREE, COLLEGE OF LIBERAL ARTS AND SCIENCES

<i>General Studies Requirements</i> (See page 9.)	96
<i>Air Science Requirement</i> (See the General Information bulletin.)	3
<i>College of Liberal Arts and Sciences Requirements</i> (See page 10.)	33
<i>Requirements for the Major in History</i>	36
GSB 101b,c, 300-9 (Count toward the total of 48 hours in history) (12) + 3	
History 452	3
History electives to complete 48 hours	30
<i>Electives</i>	24
<i>Total</i>	192

MINOR

Thirty hours are required for a minor in history, and must include GSB 101b,c, 300. Students wishing to use a history minor in the College of Education should take 12 hours each in the foreign and American fields.

COURSE DESCRIPTIONS

- GSB 300-9 (3, 3, 3) HISTORY OF THE UNITED STATES.
- 304-9 (3, 3, 3) HISTORY OF THE ANCIENT WORLD. (a) The Near East, (b) Greece, (c) Rome. May be taken individually or in any sequence.
- 308-3 HISTORY OF ILLINOIS. The history of the state from 1818 to the present. Recommended for history majors and those who expect to teach in elementary schools.
- 311-3 MEDIEVAL HISTORY. Europe from the fall of Rome to the establishment of national monarchies.
- 312-3 CENTRAL EUROPE IN THE 19TH CENTURY. An analysis of the nationalist movements in Central Europe leading to the unification of Germany and Italy and the disintegrating tendencies in the Austro-Hungarian monarchy.
- 322-12 (4, 4, 4) ENGLISH HISTORY. (a) Britain to 1603, (b) 1603-1815, (c) since 1815. May be taken individually or in any sequence.
- GSB 323-3 EAST AND WEST IN THE TWENTIETH CENTURY.
- 330-3 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.
- 352-9 (3, 3, 3) HISTORY OF LATIN AMERICA. (a) Colonial Latin America,

- (*b*) Independent Latin America, (*c*) Latin America in World Affairs. May be taken individually or in any sequence.
- 365-4 HISTORY OF CHINESE CIVILIZATION. A study of the march of Chinese civilization from prehistoric times to the present, stressing social structure, government institutions, and intellectual movements.
- 367-6 (3, 3) HISTORY OF THE FAR EAST. (*a*) Introduction to 1800, (*b*) 1800-1945. May be taken singly or in either sequence.
- GSB 369-3 THE CONTEMPORARY FAR EAST.
- 372-6 (3, 3) HISTORY OF RUSSIA. (*a*) To 1905, (*b*) since 1905. May be taken individually or in any sequence.
- 401-6 (3, 3) HISTORY OF THE SOUTH. (*a*) The Old South, (*b*) The New South. May be taken individually or in any sequence.
- 405-3 CIVIL WAR AND RECONSTRUCTION. Emphasis upon the clash of national and sectional interests; economic, political, and military aspects of the conflict; course and consequences of reconstruction. Prerequisite: 201b, 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.
- 411-9 (3, 3, 3) SOCIAL AND INTELLECTUAL HISTORY OF THE UNITED STATES. The development of American society and a study of various types of economic, social, and political thought that have influenced it. (*a*) To 1830, (*b*) 1830-1900, (*c*) since 1900. May be taken singly or in any sequence.
- 415-9 (3, 3, 3) EARLY MODERN EUROPE. (*a*) Renaissance, (*b*) Reformation, (*c*) Age of Absolutism and Enlightenment. May be taken individually or in any sequence.
- 417-9 (3, 3, 3) ADVANCED ENGLISH HISTORY. (*a*) The Empire-Commonwealth, (*b*) Constitutional History, (*c*) English Culture in the Age of the American Revolution. May be taken in any sequence.
- 420-3 THE FRENCH REVOLUTION. A sketch of the passing of feudalism in France, the background and development of the revolutionary movement, and the Napoleonic period.
- 425-3 AMERICAN COLONIAL HISTORY. Founding of the American colonies, both French and English, and the development of political and economic institutions through the Revolutionary period.
- 430-9 (3, 3, 3) LATE MODERN EUROPE. (*a*) Age of Revolution, 1815-1880, (*b*) 1880-1918, (*c*) since 1918-Age of Dictatorships. May be taken in any sequence.
- 435-9 (3, 3, 3) RECENT UNITED STATES HISTORY. (*a*) 1877-1912, (*b*) 1913-1932, (*c*) 1933 to the present. May be taken in any sequence.
- 440-6 (3, 3) HISTORY OF AMERICAN DIPLOMACY. (*a*) To 1913, (*b*) 1913 to the present. May be taken in either sequence.
- 442-9 (3, 3, 3) HISTORY OF THE WEST. (*a*) Colonial, (*b*) Trans-Allegheny, (*c*) Trans-Mississippi. May be taken in any sequence.
- 449-3 DEVELOPMENT OF AFRO-ASIAN NATIONALISM. The reaction of the non-Western world to the impact of colonial control, industrialization, and modernization. Detailed study of the rise of national movements, the winning of independence, and the relation of Afro-Asian nationalism to the Communist World.

- 451-3 HISTORIOGRAPHY. Development of history as a written subject, including works and philosophy of the various outstanding historians in ancient, medieval, and modern periods. Prerequisite: history major or minor or consent of instructor.
- 452-3 HISTORICAL RESEARCH AND THESIS WRITING. The rules of historical research studied and applied to a definite topic. For history majors and minors 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.
- 455-3 HISTORY OF INNER-ASIAN RELATIONS. History of tribes, migrations, wars, and power politics in Central Asia and outlying areas of China, from Han times to the latest developments among national minorities astride the Sino-Soviet frontier.
- 460-9 (3, 3, 3) SOCIAL AND INTELLECTUAL HISTORY OF THE MIDDLE AGES. (a) 500-1000, (b) 1000-1250, (c) 1250-1500. May be taken singly or in a,b,c sequence.
- 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. May be taken in any sequence.
- 473-3 THE CARIBBEAN AREA IN THE TWENTIETH CENTURY. An inquiry into the changing role of the political, economic, strategic, and cultural nature of this Mediterranean of the New World.
- 500-3 to 9 History Seminar.
- 510-2 to 5 Readings in History.
- 515-3 Current U.S. History and Problems.
- 516-5 Studies in Contemporary Europe.
- 517-3 Constitutional History of the United States and Problems.
- 518-3 England in the Age of the "Glorious Revolution."
- 519-5 The Age of Jefferson.
- 553-3 New Viewpoints in American History.
- 598-3 (1, 1, 1) Teaching History in College.
- 599-1 to 9 Thesis.

HOME ECONOMICS

The College of Liberal Arts and Sciences grants the Bachelor of Arts degree with a major in home economics. A minimum of 42 hours in home economics is required. This is not a professional major. The curriculum is planned for the profession of homemaking rather than for any of the salary-earning professional careers in home economics. The curriculum is offered by the Department of Home and Family and is described in the School of Home Economics bulletin.

INTER-AMERICAN STUDIES

This course of studies is designed to meet the need for increasing concern with Latin America and the growing interest in the field. It is planned to provide students with a wide general background in the history, geography, economics, languages, and literature of Hispanic America. Special emphasis is placed upon achievement of sufficient knowledge of the Spanish language to make it an effective means of communication. This level of linguistic skill is essential to open the doors of cultural understanding and appreciation of Latin America to non-native speakers. Equal proficiency in Portuguese for those who wish to specialize in Brazilian studies will be sought.

The major in inter-American studies prepares the student to participate intelligently and effectively in business or government activities in Latin America or relating to Latin America or assists students to choose a field of specialization for research and teaching.

The following curriculum is interdepartmental and under the direction of the Latin American Institute.

BACHELOR OF ARTS DEGREE, COLLEGE OF LIBERAL ARTS AND SCIENCES

<i>General Studies Requirements</i> (See page 9.)	96
<i>Air Science Requirement</i> (See the General Information bulletin.)	3
<i>College of Liberal Arts and Sciences Requirements</i> (See page 10.)	9
The inter-American studies curriculum includes the major and minor.	
<i>Requirements for the Major in Inter-American Studies</i>	79
General Studies Area B 303, 392	(6)
Anthropology 305a, 306a	6
Economics 419, 429	8
Foreign Languages: Spanish 201-9, 220-6, 320-6, 333-9;	
Portuguese 100-5	35
Geography 467	7
Government 363, 371	6
History 352a,b, and 3 hours chosen from 352c, 471, 473	9
Philosophy 340; 477 or 478	8
<i>Electives</i>	5
<i>Total</i>	192

Students coming to Southern without any foreign language must take GSD 140-9 and Spanish 140-3 as prerequisites to the specified courses in

the language. If their special interests demand, they should expect also to take such additional courses as desired in psychology, sociology, economics, or business administration. These courses are described under the departmental entries in this bulletin and in the School of Business bulletin.

No undergraduate minor is offered.

MATHEMATICS

Professors Amos Black, John W. Hamblen, Carl E. Langenhop, Wilbur C. McDaniel, Abraham M. Mark, Charles N. Maxwell, John M. H. Olmsted (Chairman), Andrew Sobczyk.

Associate Professors Elbert Fulkerson (Emeritus, 1964), Leslie D. Gates, Jr., Dilla Hall (Emeritus, 1964), Robert W. Hunt, Morton Roy Kenner, Michael Skalsky, Thomas H. Starks, Joseph C. Wilson.

Assistant Professors Harold H. Lerch, Ernest E. Shult, Alice K. Wright (Emerita, 1958).

Instructors Zamir Bavel, Imogene C. Beckemeyer, John Samuel Brown, Joseph H. Crenshaw, George Elston, Allan Jones, Vernon Marlin, James L. Slechticky, Larry L. Wimp.

Lecturer Toccoa McClary.

Associate Professors Bernard Marks, Thomas Martinsek.

Courses in mathematics may be taken as a major by students in the College of Liberal Arts and Sciences and in the College of Education. Minors in mathematics are available to these students and to certain others. Students majoring in mathematics are required to plan schedules of mathematics courses numbered above 299 with a departmental adviser.

SUGGESTED CURRICULA IN MATHEMATICS

BACHELOR OF ARTS DEGREE, COLLEGE OF LIBERAL ARTS AND SCIENCES

<i>General Studies Requirements</i> (See page 9.)	87
<i>Air Science Requirement</i> (See the General Information bulletin.)	3
<i>College of Liberal Arts and Sciences Requirements</i> (See page 10.)	33
<i>Requirements for the Major in Mathematics</i>	48
GSD 114-9 or advanced standing	(9)
Foreign Language (French, German, or Russian)	(9)
Mathematics 150-10, 252-9 (A student may by-pass any of these in which he can demonstrate competence.)	19
Mathematics electives numbered above 299, excluding 311, 410-16 and 456-6 but including three of the following eight sequences: 305-6; 320-6; 335-6; 421-6; 452-6; 475-6; 480-7; 480-4, 483. At least one of the three sequences must be on the 400 level; either 320-6 or 421-6 must be included.	24

Mathematics grade must be at least *C* in courses numbered 150 or above.

Physics 211a (or 206a)	5
<i>Electives</i> (Physics 211b,c recommended)	21
<i>Total</i>	<u>192</u>

BACHELOR OF SCIENCE IN EDUCATION DEGREE, COLLEGE OF EDUCATION

The curriculum leading to the Bachelor of Science in Education degree with a major in mathematics in the College of Education includes the following *Requirements for the Major*:

GSD 114-9 or advanced standing	(9)
Mathematics 150-10, 252-9 (or by-pass)	19
Mathematics electives numbered above 299, excluding 410-16 and 456-6 but including 311 and three of the following eight sequences: 305-6; 320-6; 335-6; 421-6; 452-6; 475-6; 480-7; 480-4, 483. At least one of the three sequences must be on the 400 level; either 320-6 or 421-6 must be included. The recommended sequences are 320-6; 335-6; 480-4, 483.	23
Physics 211a (or 206a)	5

Other requirements are listed under Secondary Education in the College of Education bulletin. Mathematics 311 may be substituted for Secondary Education 315.

MINOR

A minor in mathematics must include Mathematics 252a and at least 12 hours of courses numbered above 252a other than 410. At least a *C* is required in all mathematics courses numbered 150 and above. 311 does not count toward a B.A. degree minor.

COURSE DESCRIPTIONS

- 106-0 INTERMEDIATE ALGEBRA. Equivalent to the third semester of high school algebra.
- 150-10 (5, 5) ELEMENTARY CALCULUS AND ANALYTIC GEOMETRY. Elementary differential and integral calculus with analytic geometry and applications. Includes the definite integral and differentiation of transcendental functions. Must be taken in a,b sequence. Prerequisites: GSD 114b,c.
- 210-4 THE TEACHING OF ELEMENTARY MATHEMATICS. A professional treatment of the subject matter of arithmetic methods and a study of trends and current literature on the teaching of arithmetic. For elementary education majors only. Prerequisite: GSD 108b.
- 220-4 ELEMENTARY STATISTICS. A basic introduction to the simpler

- problems of statistical inference. Descriptive statistics, probability distributions, estimation of parameters and tests of significance, regression and correlation. Does not count toward a major or minor in mathematics. Prerequisite: 106.
- 225-4 PROGRAMMING FOR DIGITAL COMPUTERS. An intensive course. Topics include computer organization and characteristics, machine language coding, flow charts, subroutines, symbolic coding, and compiler systems. Equipment of the University's Data Processing and Computing Center is used for applications. Prerequisite: GSD 108c, 114c, or consent of instructor.
- 252-9 (5, 4) INTERMEDIATE CALCULUS AND ANALYTIC GEOMETRY. Differentials, integration, polar coordinates, solid analytic geometry, partial differentiation, multiple integrals, and infinite series. Must be taken in a,b sequence. Prerequisite: 150b.
- 305-6 (3, 3) APPLIED MATHEMATICS FOR THE PHYSICAL SCIENCES. (a) Ordinary differential equations, linear algebra, and applications. (b) Additional topics in applied mathematics such as finite difference methods, Laplace transforms, and Fourier series. Must be taken in a,b sequence. Prerequisite: 252b.
- 311-3 THE TEACHING OF SECONDARY MATHEMATICS. A study of the nature and objectives of the secondary mathematics curriculum. Particular attention is given to the means of introducing new ideas into the high school program. For students preparing to be certified teachers of secondary mathematics. Does not count toward a mathematics major or minor in the College of Liberal Arts and Sciences. Prerequisite: 320a.
- 320-6 (3, 3) FUNDAMENTAL CONCEPTS OF ALGEBRA. Introduces abstract algebraic structures, including groups, rings, and fields. Attention is given to classical theory of numbers and polynomials. Must be taken in a,b sequence. Prerequisite: 150b.
- 335-6 (3, 3) CONCEPTS OF GEOMETRY. An elementary introduction to various geometric systems to acquaint the student with the interrelationship between geometries of current interest. Topics include axiom systems, absolute plane geometry, Euclidean geometry, and non-Euclidean geometry. Must be taken in a,b sequence. Prerequisite: 252a or consent of instructor.
- 395-2 to 12 READINGS IN MATHEMATICS. Supervised reading in selected subjects. Prerequisite: twelve hours of 300 or 400 level mathematics, "B" average in mathematics, and consent of chairman of department.
- 400-3 HISTORY OF MATHEMATICS. An introduction to the development of major mathematical concepts. Particular attention is given to the evolution of the abstract concept of space, to the evolution of abstract algebra, to the evolution of the function concept, and to the changes in the concept of rigor in the development of mathematics from 600 B.C. to the present time. Prerequisite: 320a or consent of instructor.
- 407-3 INTRODUCTION TO PARTIAL DIFFERENTIAL EQUATIONS. A continuation of 305. Topics in applied mathematics including linear partial differential equations, Bessel functions, and vector analysis. Prerequisite: 305b.
- 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 gen-

- eral linear model (multiple linear regression, analysis of variance, analysis of covariance) and non-parametric statistics; (c) design of experiments; (d) sample survey techniques. May not be used to satisfy requirements for a mathematics major or minor. Three lectures and two laboratory hours per week. Must be taken in either a,b,c,d or a,b,d,c sequence. Prerequisites: GSD 108c or 114b.
- 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 department.
- 420-3 ORTHOGONAL FUNCTIONS. Principal emphasis on Fourier series and applications. Also includes discussion of other orthogonal sets, such as the Legendre's polynomials, and orthogonalization procedures, such as Gram-Schmidt. Prerequisite 252b.
- 421-6 (3, 3) LINEAR ALGEBRA. The theory of determinants and systems of linear equations; vector spaces, linear independence, bases, dimension; linear transformations, change of base, similarity; quadratic and Hermitian forms, orthogonal and unitary transformations; triangular and diagonal form; eigenvalues and eigenvectors; normal matrices; nilpotent and idempotent matrices, the spectral theorem. Must be taken in a,b sequence. Prerequisite: 252b.
- 425-3 THEORY OF NUMBERS. Topics in elementary number theory, including properties of integers and prime numbers, divisibility, Diophantine equations, and congruence of numbers. Prerequisite: 320a.
- 426-6 (3, 3) MATHEMATICAL LOGIC. (Same as Philosophy 426.) (a) Matrix and set theoretic development of the propositional calculus, many valued logics, modal logics. Completion and consistency proofs for the propositional calculus. (b) A formal development of the predicate calculus and related problems. Must be taken in a,b sequence. Prerequisite: 320a or consent of instructor.
- 430-4 PROJECTIVE GEOMETRY. Introduction to the fundamental concepts of projective geometry. Topics usually include the study of conics, polar systems of conics, homogeneous coordinates, cross-ratio, harmonic sets, duality, projectivities, and involutions. Prerequisite: 252a or consent of instructor.
- 433-3 THEORY OF POINT SETS. General properties of sets; topology of plane sets; closed sets and open sets in metric spaces, homeomorphisms and continuous mappings, connectedness. Prerequisite: 252b and six credits in courses numbered 300 or higher, or consent of instructor.
- 440-2 to 4 MODERN ALGEBRA FOR TEACHERS. An introduction to algebra as a logical system, including groups, rings, and fields. Offered as part of the special program for secondary school teachers. Four hours available to M.S. in Ed. degree candidates, N.S.F. participants, and others who have consent of the department. Prerequisite: consent of instructor.
- 442-2 to 4 SURVEY OF GEOMETRY. A survey of geometry, including projective geometry, topology, etc. Offered as part of the special program for secondary school teachers. Four hours available to M.S. in Ed. degree

- candidates, N.S.F. participants, and others who have consent of the department. Prerequisite: 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.
- 456-6 (3, 3) **APPLIED MATHEMATICS FOR THE BEHAVIORAL SCIENCES**. Introduces students in the behavioral sciences to general mathematical procedures as an aid to analyzing the structures of their study and to particular techniques that are in current use. Includes: sets and proportional logic, partitioning and combinatorial analysis, probability theory, linear algebra, linear programming and game theory, difference equations. The mathematical content is at an introductory level; applications from the behavioral sciences are used throughout. Does not count toward a major in mathematics. Must be taken in a,b sequence. Prerequisite: GSD 108c or 114b.
- 460-4 **MODERN GEOMETRY**. Advanced topics in Euclidean geometry by the synthetic method. Topics including 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.
- 475-9 (3, 3, 3) **NUMERICAL ANALYSIS**. Introduction to approximation methods including finite differences and interpolation; numerical differentiation and quadrature; least squares approximation; numerical solution of linear and non-linear systems; numerical integration of systems of ordinary and partial differential equations. Emphasis upon error analysis throughout. Must be taken in a,b,c sequence. Prerequisite: 305a or 252b and consent of instructor.
- 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.
- 483-4 **STATISTICAL INFERENCE**. A mathematical introduction to statistical methods. Topics include sampling distributions, estimation, tests of hypotheses, and regression analysis. Prerequisite: 480a.
- 484-4 **DESIGN OF EXPERIMENTS**. A study of the mathematical and practical considerations involved in the statistical design and analysis of experiments. Consideration given to common experimental designs and such topics as missing plots, experimental constraints, efficiency of method, and separation of degrees of freedom. Prerequisite: 483.
- 501-9 (3, 3, 3) Real Variables.
- 510-4 Foundations of Mathematics.
- 520-8 (4, 4) Modern Algebra.
- 530-3 to 6 Point Set Topology.
- 536-3 Differential Geometry.
- 540-4 Group and Linear Transformation.
- 544-2 to 4 Fundamental Concepts of Calculus.
- 545-4 Intermediate Analysis for High School Teachers.

- 546-4 Convex Figures.
 550a-1 to 10 Seminar in Algebra.
 550b-1 to 10 Seminar in Geometry.
 550c-1 to 10 Seminar in Analysis.
 550d-1 to 10 Seminar in Probability and Statistics.
 550e-1 to 10 Seminar in Mathematics Education.
 555-6 (3, 3) Complex Variables.
 560-3 Calculus of Variations.
 580-9 (3, 3, 3) Mathematical Methods of Statistics.
 592-3 Research in Mathematics Education.
 595a-1 to 10 Special Project in Algebra.
 595b-1 to 10 Special Project in Geometry.
 595c-1 to 10 Special Project in Analysis.
 595d-1 to 10 Special Project in Probability and Statistics.
 595e-1 to 10 Special Project in Mathematics Education.
 599-2 to 9 Thesis.

MICROBIOLOGY

Professors Carl C. Lindegren, Maurice Ogur (Chairman), I. L. Shechmeister.
Assistant Professor Dan O. McClary.

SUGGESTED CURRICULUM IN MICROBIOLOGY

BACHELOR OF ARTS DEGREE, COLLEGE OF LIBERAL ARTS AND SCIENCES

<i>General Studies Requirements</i> (See page 9.)	87
<i>Air Science Requirement</i> (See the General Information bulletin.)	3
<i>College of Liberal Arts and Sciences Requirements</i> (See page 10.)	9
<i>Requirements for the Major in Microbiology</i> (with a minor in chemistry)	90
GSA 201, 202, 203	(9)
GSD 114-9	(9)
Chemistry 111-15, 235-5, 305-8 (This is a minor.)	28
Microbiology 301, 302, 403, 425, 426, 441, 451	32
Microbiology electives to complete 47 hours	15
Physics 206-15	15
<i>Electives</i>	3
<i>Total</i>	<u>192</u>

MINOR

The minor in microbiology consists of 24 hours to include 301 and 302; the rest of the minor should be determined by the individual student in consultation with a departmental adviser.

COURSE DESCRIPTIONS

- 301-5 PRINCIPLES OF MICROBIOLOGY. A survey of morphology, structure, metabolism, population dynamics, and heredity of the microbial agents, with particular emphasis on pure culture methods of study of the bacteria, viruses, and related organisms. 4 hours lecture, 5 hours laboratory. Prerequisite: one year of college chemistry and GSA 201 or equivalent.
- 302-5 GENERAL MICROBIOLOGY. Interrelationships of microorganisms and their positions and influence in the biological world; relationships to soil fertility, host-parasite relationships, mechanisms of infection and resistance principles of chemotherapy, and their exploitation by man in medicine and industry. 3 hours lecture and 5 hours laboratory. Prerequisite: 301.
- 350-1 to 3 READINGS IN MICROBIOLOGY.
- 401-1 SEMINAR. (For undergraduates only.) Prerequisite: senior standing and consent of instructor. This course may be taken for credit once only.
- 403-5 MEDICAL BACTERIOLOGY. A general survey of the mechanisms of infection, epidemiology, and immunity and the specific application of these principles to the symptomatology, diagnosis, treatment, and control of the more common bacterial infections of man. 3 hours lecture and 4 hours laboratory. Prerequisite: 301 and 302, or equivalent.
- 422-5 MICROBIOLOGY OF FOODS. The relationships of microorganisms to the preparation and preservation of foods with consideration of the laws governing sanitation, chemical preservatives, and fair dealing of the food producer. 3 hours lecture, 4 hours laboratory. Prerequisite: 301.
- 423-5 INDUSTRIAL FERMENTATION. The application of the chemical activities of microorganisms to the industrial production of beverages, foods, antibiotics, and various commercial chemicals. 3 hours lecture, 4 hours laboratory. Prerequisites: 301 and organic chemistry.
- 424A-2 to 3 SOIL MICROBIOLOGY. (Same as Plant Industries 424a.) Numbers, characteristics, and biochemical activities of soil microorganisms, with particular consideration of their role in the transformations of organic matter, nitrogen, and minerals as related to soil fertility and management. Lectures. Prerequisite: GSA 201c.
- 425-3 BIOCHEMISTRY AND PHYSIOLOGY OF MICROORGANISMS. The chemical basis of physiological functions in microbial cells with emphasis on the pathways of metabolism common to all living things. 3 hours lecture. Prerequisites: 301 and organic chemistry.
- 426-2 BIOCHEMISTRY AND PHYSIOLOGY OF MICROORGANISMS. 4 hours laboratory. Prerequisite or corequisite: 425.
- 441-6 VIROLOGY. Properties, cultivation, and titration of viruses and rickettsiae; cellular infection, multiplication, and liberation of virus; immunological reactions and serological identification; haemmagglutination and interference phenomena. 3 hours lecture, 6 hours laboratory. Prerequisite: 403.
- 451-6 IMMUNOLOGY. Natural and acquired immunity; antigens, antibodies, and antigen-antibody reactions; hypersensitivity; practical use of immunity and hypersensitivity. 3 hours lecture, 6 hours laboratory. Prerequisite: 403.

- 500-1 Seminar.
 501-2 Genetics of Microorganisms.
 503-2 Cytology of Microorganisms.
 504-5 Methods of Microbiological Research.
 506-2 Bibliographic Methods in Microbiology.
 507-8 BSCS—High School Biology.
 511-1 to 15 Research.
 525-3 Biochemistry and Physiology of Microorganisms.
 526-2 Biochemistry and Physiology of Microorganisms.
 528-1 to 10 Readings in Microbiology.
 550-4 Microbiology for High School Teachers.
 551-2 Intermediate Microbiology for High School Teachers.
 552-1 Seminar in Biological Sciences.
 599-3 to 9 Thesis.
 600-3 to 48 Dissertation.

MUSIC

The music major in the College of Liberal Arts and Sciences is designed for students who wish to specialize in music as part of their general cultural education. It is also designed to provide a background training for those who may plan to pursue advanced studies in such fields as music criticism and aesthetics.

Required courses in music for this major are 105-12, 205-9, GSC 357-9, applied music courses totaling 12 hours, and electives in music to complete a total of 60 hours for the major.

Students who desire to minor in music must meet a minimum requirement of 42 hours in music, the courses to be worked out in consultation with the department chairman.

PHILOSOPHY

Research Professor Lewis E. Hahn.

Professors George E. Axtelle, Baker Brownell (Emeritus, 1954), Arthur J. Dibden, William Henry Harris, Wayne A. R. Leys, William J. McKeefery, Willis Moore (Chairman), George K. Plochmann, Charles D. Tenney.

Associate Professors James A. Diefenbeck, S. Morris Eames.

Assistant Professor George G. McClure, Don Ihde.

Visiting Professors Luis A. Baralt, Henry N. Wieman.

Courses in philosophy are available at each level of the General Studies curriculum for use in partial satisfaction of the requirements in Area C. The prospective major in philosophy is advised to elect at least one such course at each of the first two levels.

A major in philosophy consists of 45 hours, 3 of which may be selected from philosophy courses in the first two levels of the General Studies curriculum.

SUGGESTED CURRICULUM IN PHILOSOPHY

BACHELOR OF ARTS DEGREE, COLLEGE OF LIBERAL ARTS AND SCIENCES

<i>General Studies Requirements</i> (See page 9.)	96
<i>Air Science Requirement</i> (See the General Information bulletin.)	3
<i>College of Liberal Arts and Sciences Requirements</i> (See page 10.)	33
<i>Requirements for the major in philosophy</i>	39
General Studies Area C 381, 382, 383	(6) + 3
Philosophy 300, 320, 481a, GSC 386, 387 (Any two)	6
Philosophy electives	30
<i>Electives</i>	21
<i>Total</i>	<hr/> 192

MINOR

A minor in philosophy requires 24 hours, 6 of which may be selected from philosophy courses offered at the first two levels of the General Studies curriculum, and 12 of which should be selected from the courses listed above for the major.

COURSE DESCRIPTIONS

- 200-4 TYPES OF PHILOSOPHY. Study of realism, idealism, and materialism.
- 300-4 ELEMENTARY METAPHYSICS. Presentation of answers to the most general problems of existence. An attempt to unify all scientific approaches to reality through the laying down of common principles.
- 301-4 PHILOSOPHY OF RELIGION. An analysis of problems in the psychology, metaphysics, and social effects of religion. Among topics discussed are the nature of mystical experience, the existence of God, and problems of suffering, prayer, and immortality.
- 305-4 PHILOSOPHY OF SCIENCE. A nontechnical discussion of philosophic problems as they emerge from the various sciences, with readings from works addressed to the lay public.
- GSC 310-3 RELIGIOUS FOUNDATIONS OF WESTERN CIVILIZATION.
- GSC 311-3 PHILOSOPHIES AND RELIGIONS OF INDIA.
- GSC 312-3 PHILOSOPHIES AND RELIGIONS OF THE FAR EAST.
- 320-4 GENERAL LOGIC. Terms, propositions, and reasoning. Logic as an instrument for the solution of problems in natural and social sciences.
- 340-4 ELEMENTARY ETHICS AND POLITICS. Problems of right and wrong for the individual and society.
- 355-4 PHILOSOPHY OF EDUCATION. Survey of theories of education and

- their relationships to educational policies and practices, as elucidated by the great teachers. Satisfies the education requirement, Education 355.
- 360-4 PHILOSOPHY OF ART. The significance of art as a human activity, its nature and standards as seen in the problems of criticism, and the relation of art to other forms of knowledge.
- GSC 381-3 GREEK PHILOSOPHY.
- GSC 382-3 GRAECO-ROMAN AND MEDIEVAL PHILOSOPHIES.
- GSC 383-3 EARLY MODERN PHILOSOPHY.
- GSC 386-3 EARLY AMERICAN PHILOSOPHY.
- GSC 387-3 RECENT AMERICAN PHILOSOPHY.
- 406-4 PHILOSOPHY OF BIOLOGY. Leading concepts of biological sciences: species, evolution, life, organism and part, etc. Abstract ideas of biology are related, wherever possible, to specific experiments recorded in scientific literature. Prerequisites: 300 or 320, and three laboratory or field courses in the biological sciences or consent of instructor.
- 415-3 LOGIC OF THE SOCIAL SCIENCES. (Same as Sociology 415.) Logical and epistemological examination of social studies as types of knowledge. Basic problems in philosophy of science with major emphasis upon social science: relationship of theory to fact, nature of induction, nature of casual law, testability, influence of value judgments, etc. Intended for students with considerable maturity in a social science or in philosophy.
- 420-4 ADVANCED LOGIC. A careful study of symbolic and discursive systems of logic: Aristotle, Spinoza, Boole, Whitehead, and Johnson. Prerequisites: 320 and consent of instructor.
- 426-6 (3, 3) MATHEMATICAL LOGIC. (See Mathematics 426.)
- 428-3 LOGIC OF THE EXACT SCIENCES. Critical study of the technical and philosophic problems associated with formal logic and its uses as a tool for model construction, for formalizations, reconstructions, and as an image of rational thought. Prerequisites: 426 or consent of instructor.
- 441-4 PHILOSOPHY OF POLITICS. Some of the central problems of modern political life, such as sovereignty, world government, authority and consent, the relations of economics and social studies to political theory. Prerequisite: GSC 102 or 340 or consent of instructor.
- 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. Prerequisites: consent of instructor.
- 460-4 ADVANCED PHILOSOPHY OF ART. The definition of art, its relations to science, culture, and morals; the various types of art defined. Familiarity with at least one of the fine arts is assumed. Prerequisites: GSC 207 or 360, and six courses in music, painting, sculpture, literature, or drama.
- 477-4 LATIN AMERICAN PHILOSOPHY. A survey of philosophic thought in Latin America from colonial times, through nineteenth century positivism and the reactions against it, up to present trends. Reading of original texts in English translations. Discussions and reports. Prerequisite: consent of instructor.
- 478-4 SEMINAR IN LATIN AMERICAN THOUGHT. Investigation of research topics connected with Latin American thought during the nineteenth and twentieth centuries in the fields of government, social sciences, education, literature, and philosophy. Individual studies and reports. Prerequisite: consent of instructor.

- 481-6 (3, 3) 19TH CENTURY EUROPEAN PHILOSOPHY. (a) Kant, Schopenhauer, and Hegel. (b) Nietzsche, Bergson, the Utilitarians, and latter day idealists. May be taken singly and in any sequence.
- 482-3 RECENT EUROPEAN PHILOSOPHY. Phenomenology, Positivism, Linguistic Analysis, and Existentialism.
- 490-2 to 12 SPECIAL PROBLEMS. Hours and credits to be arranged. Courses for qualified seniors and graduates who need to pursue certain topics further than regularly titled courses permit. Special topics announced from time to time. Students are invited to suggest topics for individual study and papers or for group study. Consent of instructor in all cases required.
- 500-2 to 4 Seminar in Metaphysics.
- 501-2 to 4 Seminar in the Philosophy of Religion.
- 515-3 Theory of Nature.
- 530-2 to 4 Seminar in Theory of Knowledge.
- 540-3 Philosophy of Journalism.
- 570-3 Seminar in American Idealism.
- 581-2 to 4 Seminar in Plato.
- 582-2 to 4 Seminar in Aristotle.
- 585-3 British Empiricism.
- 586-2 to 4 Seminar in Spinoza.
- 587-3 Seminar in Hegel.
- 588-2 to 4 Seminar in Kant.
- 589-2 to 12 General Graduate Seminar.
- 590-2 to 12 General Graduate Seminar.
- 591-1 to 5 Readings in Philosophy.
- 599-2 to 9 Thesis.
- 600-3 to 48 Dissertation.

PHYSICS AND ASTRONOMY

Professors Martin J. Arvin (Acting Chairman), Charles J. Brasefield (Emeritus, 1964), Richard E. Watson, Otis B. Young.
Associate Professor William E. Nickell.
Assistant Professors Jason J. Collins, Walter Carl Henneberger, Richard L. Linster, Charlotte Zimmerschied.
Instructors Robert C. Ethernon, James L. Harbison, Robert S. Revak, Richard R. Todd.

Courses in physics may be taken as a major by students in the College of Liberal Arts and Sciences and in the College of Education.

SUGGESTED CURRICULA IN PHYSICS

BACHELOR OF ARTS DEGREE, COLLEGE OF LIBERAL ARTS AND SCIENCES

<i>General Studies Requirements</i> (See page 9.)	87
<i>Air Science Requirement</i> (See the General Information bulletin.)	3
<i>College of Liberal Arts and Sciences Requirements</i> (See page 10.)	33

<i>Requirements for the Major in Physics</i>	89
General Studies Area D 114-9	(9)
Chemistry 111-10	10
Mathematics 150-10, 252-9, 305-6	25
Physics 211-15 (or 206-15 with consent of the department); 301-8, 305-10, 413-8	41
Physics 304, 310, 405, 414, 450 (any three)	13
<i>Total</i>	<u>212</u>
<i>Total</i> (if the minor is mathematics)	192

BACHELOR OF SCIENCE IN EDUCATION DEGREE, COLLEGE OF EDUCATION

The curriculum leading to the Bachelor of Science in Education degree with a major in physics in the College of Education differs from the B.A. degree curriculum, above, in two respects: No foreign language is required, and only two of 304, 310, 405, 414, 450 are required.

MINOR

Suggested courses for a minor in physics for a student who is taking calculus: 211 and two of the following: 305a, 310, 413a.

Suggested courses for a minor in physics for a student who does not plan to take calculus: 206, 310, 312.

COURSE DESCRIPTIONS

ASTRONOMY COURSES

201-4, 202-4 INTRODUCTION TO ASTRONOMY. These two terms together constitute a single complete course. Four recitations a week, together with frequent evening observations with and without telescope.

PHYSICS COURSES

206-15 (5, 5, 5) COLLEGE PHYSICS. Designed to meet premedical requirements and the needs of all students majoring in one of the sciences, except physics. Laboratory. Must be taken in a,b,c or a,c,b sequence. Prerequisite: GSD 114c.

211-15 (5, 5, 5) UNIVERSITY PHYSICS. Primarily for physics majors and pre-engineers. Laboratory. Must be taken in a,b,c or a,c,b sequence. Prerequisite: Mathematics 150b (or concurrent enrollment).

301-8 (4, 4) MECHANICS. Intermediate theoretical mechanics, using vector analysis: kinematics, particle dynamics, rigid body mechanics, oscillations, wave motion, and advanced principles. Prerequisites: 206a or 211a, Mathematics 305a, or concurrent enrollment, or consent of instructor.

304-3 THERMODYNAMICS. Survey of laws of classical thermodynamics. Their constituents in application to some simple thermodynamic systems;

phase equilibrium and theory of phase transitions. Prerequisites: 206 or 211, Mathematics 252b.

- 305-10 (5, 5) INTRODUCTION TO ELECTRIC THEORY. Vector treatment of the theory, with laboratory: electrostatics in vacuo and in matter, steady currents, magnetism, alternating currents, complex number analysis of a-c circuits, electromagnetic radiation. Prerequisites: 206 or 211; Mathematics 305a, or concurrent enrollment, or consent of instructor.
- 310-5 LIGHT. A study of light propagation and optical instruments; interference, diffraction and polarization of light. Laboratory. Prerequisite: 206b or 211b.
- 312-5 RADIO. A study of radio receivers and transmitters. Laboratory. Prerequisite: 206 or 211.
- 404-3 INTRODUCTION TO STATISTICAL MECHANICS. A brief treatment of the kinetic theory of gases; introduction of phase spaces and ensemble theory. Shows the connection between mechanical and thermodynamic concepts and obtains a statistical interpretation of the thermodynamic processes. Prerequisites: 301; 304 or consent of instructor.
- 405-5 ELECTRONICS. The physics of vacuum tubes and semiconductor devices. Elementary theory and application of vacuum tubes as circuit elements in power supplies, oscillators, amplifiers, and shaping circuits. Laboratory. Prerequisites: 305; Mathematics 305b or consent of instructor.
- 410-5 PHYSICAL OPTICS. A theoretical and experimental study of light as electromagnetic energy; its production, detection, and measurement. Laboratory. Prerequisites: 305; Mathematics 305b or consent of instructor.
- 413-8 (4, 4) ATOMIC PHYSICS. A general survey of modern physics including relativity theory, quantum theory, atomic structure and spectra, and wave mechanics. Prerequisites: 301, 305; Mathematics 305b or consent of instructor.
- 414-5 NUCLEAR PHYSICS. Basic properties of nuclei, systematics of nuclear stability, radioactive decay; alpha, beta, and gamma ray spectroscopy, nuclear reactions, models of the nucleus, neutron physics and elementary particles. Prerequisite: 413.
- 420-2 to 5 SPECIAL PROJECTS. Each student is assigned a definite investigative topic. Adapted to advanced undergraduate students. Prerequisites: 301, 305.
- 425-5 ELECTRICAL PHENOMENA IN GASES. Excitation and ionization of gas atoms; diffusion of ions; space charge; glow and arc discharges. Prerequisite: 305.
- 450-5 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 semi-conductors. Prerequisites: 305, 413; 304 or consent of instructor.
- 501-15 (5, 5, 5) Methods of Theoretical Physics.
- 511-12 (4, 4, 4) Mathematical Methods of Physics.
- 520-2 to 5 Special Projects.
- 531-9 (3, 3, 3) Quantum Mechanics.
- 590-1 to 9 Thesis.

PHYSIOLOGY

Professors Jay A. Bender, Harold M. Kaplan (Chairman).

Associate Professors Florence M. Foote, George H. Gass, Joseph P. Miranti.

Assistant Professor Tommy T. Dunagan.

Adjunct Professor Eli L. Borkon.

Research Associate Joginder Nath

SUGGESTED CURRICULUM IN PHYSIOLOGY

BACHELOR OF ARTS DEGREE, COLLEGE OF LIBERAL ARTS AND SCIENCES

<i>General Studies Requirements</i> (See page 9.)	96
<i>Air Science Requirement</i> (See the General Information bulletin.)	3
<i>College of Liberal Arts and Sciences Requirements</i> (See page 10.)	33
<i>Requirements for the Major in Physiology</i>	42
Physiology electives selected in consultation with the chairman of the department to total at least 42 hours.	
<i>Related Requirements for the Major</i>	0-30
A background of basic courses in chemistry, mathematics, and physics is required. Courses in botany and zoology are recommended.	
<i>Electives</i>	0-18
<i>Total</i>	<u>192</u>

MINOR

A minor in physiology requires a minimum of 24 hours.

COURSE DESCRIPTIONS

215-3 INTRODUCTION TO PHARMACOLOGY. Use and action of drugs on the human body. Primarily for nurses. Three hours lecture per week.

300-4 HUMAN ANATOMY. Lectures, demonstrations, and periodic observation of the prosected body. Lectures confined to bones, joints, muscles, and nerves. Primarily for majors in physical education. Four hours lecture per week. One section, 300N, is reserved chiefly for nursing students. All bodily systems are reviewed. A three-hour laboratory is substituted for one of the lectures.

GSA 301-4 PRINCIPLES OF PHYSIOLOGY.

GSA 302-3 PSYCHOBIOLOGICAL FOUNDATIONS OF BEHAVIOR.

315-15 (5, 5, 5) ADVANCED COLLEGE PHYSIOLOGY. Lectures emphasize

mammalian and human physiology whereas the laboratory involves function throughout the vertebrate classes. (a) Blood, circulation, and respiration; (b) digestion, excretion, and endocrines; (c) muscles, nervous system, and sense organs. 3 hours lecture and 4 hours laboratory per week.

- 410-15 (5, 5, 5) **ADVANCED ANATOMY.** Dissection of the human body. Primarily for majors in physiology and other biological sciences. Not a premedical course. 2 hours lecture, 6 hours laboratory.
- 414-4 **ANATOMY AND PHYSIOLOGY OF SPEECH.** (Same as Speech Correction 414.) The anatomy and physiology of the vocal apparatus. Primarily for majors in speech correction. 3 hours lecture, 2 hours laboratory.
- 415-8 (4, 4) **EXPERIMENTAL ANIMAL SURGERY.** Preparation of animals for surgery. Anesthesia, instruments, care of animal quarters, selected exercises. 2 hours lecture, 4 hours laboratory. Part b may be elected independently of a.
- 417-6 (3, 3) **PRINCIPLES OF PHARMACOLOGY.** Action of drugs and other chemical substances upon the living organism. Physiological and biochemical events resulting from the action of drugs. Pharmacodynamics, chemotherapy, toxicology, and therapeutics. 2 hours lecture and 2 hours laboratory. Part b may be elected independently of a. Prerequisite: basic courses in chemistry and biological sciences.
- 430-12 (4, 4, 4) **CELLULAR PHYSIOLOGY.** The nature and mechanism of the living cell. Chemical and physical aspects of vital activity. Recommended for students interested in biochemistry and biophysics. 3 hours lecture and 2 hours laboratory.
- 433-4 **COMPARATIVE PHYSIOLOGY.** Fundamental physiological processes and the manner in which they vary in various groups of animals. Recommended for majors in physiology and for students in other biological sciences. 3 hours lecture, 2 hours laboratory.
- 440-3 **ELECTRON MICROSCOPY.** Basic experience with the operation of the electron microscope. Specimen preparation. Prerequisites: advanced background in any natural or physical science. 2 hours lecture, 2 hours laboratory.
- 450-4 to 16 **SPECIAL PROBLEMS IN PHYSIOLOGY.** Selected problems in various aspects of physiology. 8 hours laboratory. Open only by permission.
- 455-2 **PHYSIOLOGICAL PROBLEMS IN REHABILITATION.** Designed for the Rehabilitation Counseling Program. Problems of the handicapped. 2 hours lecture.
- 460-12 (4, 4, 4) **MAMMALIAN PHYSIOLOGY.** For graduate students who need a knowledge of human or mammalian function. Same as 315.
- 500-1 to 9 Advanced Seminar.
- 519-3 Experimental Pharmacology.
- 520-9 (3, 3, 3) Physiological Technics.
- 521-1 to 6 Readings in Current Physiological Literature.
- 530-8 (4, 4) Advanced Cellular Physiology.
- 540-8 (4, 4) Advanced Comparative Physiology.
- 550-3 Radiation Biology.
- 599-3 to 9 Thesis.
- 600-4 to 36 Doctoral Dissertation.

PSYCHOLOGY

Research Professor Noble H. Kelley.

Professors David Ehrenfreund (Chairman), Jack W. Graham, Alfred Lit, Guy A. Renzaglia, William Carl Westberg.

Associate Professors Sheldon Alexander, Neil Alan Carrier, Loren Chapman, William Gerler, Peter M. Lewinsohn, John George Martire, Donald J. Shoemaker.

Assistant Professors Philip F. Caracena, Peter Wing Hemingway, Edward Lichtenstein, James McHose, James Curtis Mitchell, Gordon Francis Pitz, Janet Eileen Rafferty, Thomas Ramon Schill, William Wagman.

Adjunct Professor Robert Carl Steck.

SUGGESTED CURRICULUM IN PSYCHOLOGY

BACHELOR OF ARTS DEGREE, COLLEGE OF LIBERAL ARTS AND SCIENCES

<i>General Studies Requirements</i> (See page 9.)	96
<i>Air Science Requirement</i> (See the General Information bulletin.)	3
<i>College of Liberal Arts and Sciences Requirements</i> (See page 10.)	33
<i>Requirements for the Major in Psychology</i>	40
General Studies Area A 301	(4)
General Studies Area B 201c	(3)
Psychology 211-8	8
Psychology electives including either Group One or Group Two and excluding 323, 420, 432, and 465	32
<i>Group One, For Students Planning Graduate Study:</i> 311; any one of 312, 313, 314; any two of 301, 303, 304, 305, 307, 320, 322; any two of 404, 406, 407, 408, 409, 421, 431, 440, 451, 461, 471; and any two additional courses previously listed.	
<i>Group Two, For Students Planning No Graduate Study:</i> any eight of the courses listed in Group One, including at least three 400-level courses	
<i>Electives</i>	20
<i>Total</i>	192

MINOR

Courses 323, 420, 432, and 465 may not be used to satisfy the major requirements, but are acceptable for the minor, which requires 24 hours.

For further information and advisement, consult the Department of Psychology.

COURSE DESCRIPTIONS

- 211-8 (4, 4) **PRINCIPLES AND METHODS OF PSYCHOLOGY.** An introduction to the experimental methods utilized in the study of behavior. (a) The application of methods to the study of sensation, perception, and learning, (b) the analysis and interpretation of psychological data. Lecture and laboratory. Must be taken in a,b sequence. Prerequisite: GSB 201c.
- 301-4 **CHILD PSYCHOLOGY.** A study of the biological and psychological development of the child from birth through puberty, and of relevant research methods and results. Prerequisite: GSB 201c.
- 303-4 **ADOLESCENT PSYCHOLOGY.** Examines the physical and psychological development of the adolescent, and the relevance of childhood development to adolescent problems. Prerequisite: GSB 201c.
- 304-4 **PSYCHOLOGY OF MATURITY AND OLD AGE.** A consideration of psychological factors in later maturity and old age and their concomitant problems, both individual and societal. Prerequisite: GSB 201c.
- 305-4 **PSYCHOLOGY OF PERSONALITY.** A study of the inferred patterns underlying an individual's unique reactions to his environment. Investigates the motivations, development, and methods of changing these patterns, and how personality processes are studied. Prerequisite: GSB 201c.
- 307-4 **SOCIAL PSYCHOLOGY.** Introduction to the study of the individual's interaction with his social environment. Considers problems of social learning, communication, social influence processes and group behavior. Prerequisite: GSB 201c.
- 311-4 **EXPERIMENTAL PSYCHOLOGY: LEARNING.** Investigates the processes governing behavioral change. Experimental studies of conditioning, memory, and forgetting will be emphasized. Laboratory work will include the design and conduct of experiments with humans and animals. Lecture and laboratory. Prerequisite: 211b.
- 312-4 **EXPERIMENTAL PSYCHOLOGY: PERCEPTION.** Investigates the variables influencing an organism's stimulation by his environment. The structure and operation of the sense organs as well as complex perceptual phenomena are examined in lectures and laboratory. Prerequisite: 211b.
- 313-4 **EXPERIMENTAL PSYCHOLOGY: MOTIVATION.** An examination of both biological and social variables influencing the activation, direction, and maintenance of behavior. Laboratory work will examine the effects of motivation upon behavior. Lecture and laboratory. Prerequisite: 211b.
- 314-4 **EXPERIMENTAL PSYCHOLOGY: COMPARATIVE AND PHYSIOLOGICAL.** An examination of the physiological and phylogenetic variables affecting behavior. The laboratory will involve work with different types of organisms, emphasizing physiological concomitants of behavior. Lecture and laboratory. Prerequisite: 211b.
- 320-4 **INDUSTRIAL PSYCHOLOGY.** A study of the use of psychological methods in the analysis of human factor problems in business and industry. Prerequisite: GSB 201c.
- 322-4 **PERSONNEL PSYCHOLOGY.** A study of the use of psychological methods in the selection, placement, and evaluation of personnel in business and industry. Prerequisite: GSB 201c.

- 323-4 PSYCHOLOGY OF EMPLOYEE RELATIONS. Job satisfaction and morale, psychological aspects of labor relations, interviewing methods, and human relations training. Lecture and laboratory. Prerequisite: GSB 201c.
- 399a-3 to 9, 399b-3 to 12 RESEARCH AND INVESTIGATION. Honors. Intensive study in selected areas for students qualified for honors work in psychology. A research paper or equivalent will be required. Prerequisite: Consent of chairman. (a) For juniors, (b) for seniors.
- 404-4 THEORIES OF PERCEPTION. An examination of the different theories concerned with an organism's sensory contact with his environment. Physiological, social, and organizational theories of perception will be considered. Prerequisite: 211b or consent of instructor.
- 406-4 LEARNING PROCESSES. Processes by which individual behavior is changed, using procedures developed in the learning laboratory. Introduction to major concepts and data of learning. Prerequisite: consent of instructor.
- 407-4 THEORIES OF LEARNING. A consideration of the major contemporary learning theories and their relation to experimental data. Prerequisite: 211b or consent of instructor.
- 408-4 THEORIES OF MOTIVATION. An examination of instinct theories, biological drives, emotions, social motives, and psychodynamic theories as they contribute to a comprehensive psychology of motivation. Prerequisite: 211b or consent of instructor.
- 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 departmental adviser.
- 420-4 SCIENTIFIC METHODOLOGY IN PSYCHOLOGY. Scientific methodology as an approach to investigation and classification of problems involved in understanding the psychological nature of man. Prerequisite: consent of instructor.
- 421-4 PSYCHOLOGICAL TESTS AND MEASUREMENTS. Principles of psychological measurement, including errors of measurement, techniques for estimating reliability and validity, techniques of test construction, and problems in assessment and prediction. The laboratory will include the use of selected instruments. Lecture and laboratory. Prerequisite: 8 hours of psychology.
- 424-4 PSYCHOPHYSICAL METHODS. Survey of the major psychophysical methods and their applications. Lecture and laboratory. Prerequisite: 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. An integration of psychological knowledge and principles concerning factors and conditions affecting the individual which tends to facilitate or to deter mental health. Prerequisite: 305 or consent of instructor.
- 433-2 to 6 PERSONALITY AND MENTAL HEALTH. Seminar on the basic factors in psychological development and their implications for mental health and psychopathology. Prerequisite: consent of instructor.

- 438-4 PSYCHOLOGICAL CONSIDERATIONS IN TREATMENT. For advanced undergraduates and graduate students entering allied professions in which they will be directly concerned with corrective or remedial service. Basic psychological principles and considerations relevant to planning and conducting such treatment; potentialities and limitations of individual and group treatment; environmental manipulation. Prerequisite: recommendation of student's major department.
- 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 psychobiological 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. A study of the analysis and evaluation of jobs and the measurement of work performance by the use of standard time tables. Prerequisite: 320 or consent of instructor.
- 483-3 CURRENT PROBLEMS IN CORRECTIONS. (See Sociology 483.)
- 490-1 to 16 INDEPENDENT PROJECTS. Independent readings and projects in psychology. Prerequisite: consent of instructor and chairman of department.
- 495-1 to 18 SEMINAR: SELECTED TOPICS. Varied content. To be offered from time to time as need exists.
- 501-12 (4, 4, 4) Proseminar in General Psychology.
- 509-4 Instrumentation in Behavioral Science.
- 512-4 Sensory Processes.
- 514-8 (4, 4) Physiological Psychology.
- 520-4, 521-4, 522-4 Research Design and Inference I, II, III.
- 523-2 Research Seminar.
- 524-4 Advanced Research Methodology.
- 525-4 Mental Test Theory.
- 530-4 Personality Theory and Dynamics.
- 531-2 to 4 Advanced Psychopathology.
- 532-2 Experimental Approaches to Personality.
- 533-3 Experimental Approaches to Psychopathology.
- 536-4 Fundamentals of Counseling.
- 537-4 Counseling and Psychotherapy.
- 538-2 Group Psychotherapy.
- 541-6 (4, 2) Psychodiagnostics I.
- 543-6 (4, 2) Psychodiagnostics II.
- 545-2 Psychodiagnostics III.

- 546-3 to 4 Psychodiagnostics for Special Populations.
 547-2 Assessment Procedures in Counseling.
 552-4 Experimental Child Psychology.
 554-2 Development Theory.
 556-2 Psychological Treatment of the Child.
 561-4 Social Influence Processes.
 562-4 Observational Techniques and Content Analysis.
 564-4 Communication and Group Behavior.
 571-4 Industrial Motivation and Morale.
 572-4 Industrial Training.
 573-2 Selection and Placement.
 574-2 Psychology of Industrial Relations.
 576-2 to 4 Human Engineering.
 590-1 to 16 Readings in Psychology.
 591-1 to 36 Research in Psychology.
 593e-1 to 18 Practicum in Clinical Psychology.
 593f-1 to 18 Practicum in Counseling Psychology.
 593h-1 to 18 Practicum in Industrial Psychology.
 593j-1 to 18 Practicum in Child Psychology.
 593k-1 to 18 Practicum in School-Community Mental Health Psychology.
 593l-1 to 18 Practicum in Teaching of Psychology.
 593m-1 to 18 Practicum in Rehabilitation.
 593n-1 to 18 Practicum in Rehabilitation Counseling.
 595-1 to 18 Advanced Seminar.
 598-2 Ethical and Professional Problems in Psychology.
 599-1 to 9 Thesis.
 600-1 to 45 Dissertation.

RELIGION

The educated citizen will have some knowledge of the cultural traditions contributing to our Western civilization. A great part of our heritage is directly related to the treasure of knowledge and practices of our religious traditions. Through the religious foundations, credit courses in religion provide an opportunity for every student to enjoy a fuller educational experience.

Students may present a minor in religion to satisfy the minor requirement for a degree in the College of Liberal Arts and Sciences. This minor consists of thirty quarter-hours: fifteen hours earned in courses selected from the following list (Group A) offered by the academic departments of the college; and (Group B) fifteen hours earned in courses offered by the various religious foundations. In the second group of fifteen hours, courses must be taken in at least two foundations.

Group A courses include GSC 310, 345, 382, 383, English 438, 473, History 304, 415b, Philosophy 301, 340, Psychology 305, 307, Sociology 102,

333, 340, 351, 450. Descriptions of these courses may be found under the various departments or in the General Studies bulletin.

Description of courses offered by the religious foundations and the list of required courses for the minor in Religion may be secured from the foundations or from the College of Liberal Arts and Sciences. The maximum credit in religion courses accepted toward the bachelor's degree is 15 hours.

RUSSIAN AND CENTRAL EUROPEAN STUDIES

A minor in area studies with specialization in Russian studies or in Central European studies is offered especially for those students who also work for a minor or a major in foreign languages: Russian for Russian studies; German, Russian, or French for Central European studies.

For both minor programs a minimum of 24 hours must be earned in the chosen field, at least 12 of them in principal courses, the rest by electives. Not more than three courses offered by one department will be counted toward fulfillment of the requirements. In exceptional cases an elective course may be substituted after consultation with the adviser for the program.

Principal courses for the *Russian studies* consist of Economics 460, Geography 464, Government 453, History 372. Electives are GSB 312, Anthropology 305b, 306b, Economics 418, 481, Geography 462, Government 455, History 312, 430.

Principal courses for the *Central European studies* consist of GSB 390, Economics 418, Geography 462, Government 455, History 312, 430. The electives are GSB 312, Anthropology 306b, Economics 460, 481; Geography 464, Government 453, History 372. One reading course or one independent-studies course can be used in fulfillment of the requirements. Each student's curriculum, however, should be approved by the adviser for the program.

SOCIOLOGY

Research Professor Richard W. Poston.

Professors Myrl E. Alexander, Paul J. Campisi, Frank Hartung, Joseph K. Johnson, Herman R. Lantz, Peter Andreas Munch, Wilson Record, Charles R. Snyder (Chairman), William J. Tudor, James D. Turner.

Associate Professors Melvin S. Brooks, Richard C. Franklin, Eloise C. Snyder.

Assistant Professors Joe C. Eades, Frank C. Nall, II, Louis Petroff, Raymond L. Schmitt, Ronald W. Vander Wiel.

Instructors Robert C. Child, William Simon, William T. Tucker.

Visiting Professors Hugh D. Duncan, Raymond E. Wakeley.

The Department of Sociology offers major and minor programs for students in both the College of Liberal Arts and Sciences and the College of Education.

SUGGESTED CURRICULA IN SOCIOLOGY

BACHELOR OF ARTS DEGREE, COLLEGE OF LIBERAL ARTS AND SCIENCES

<i>General Studies Requirements</i> (See page 9.)	96
<i>Air Science Requirement</i> (See the General Information bulletin.) ..	3
<i>College of Liberal Arts and Sciences Requirements</i> (See page 10.)	33
<i>Requirements for the Major in Sociology</i>	36
General Studies Area B 201-9, 321-3	(12)
General Studies Area D 108-9 (or Mathematics 220-4)	(9)
Sociology 400, 407, 412, 451	15
Sociology electives in courses whose second digit is not 8, to complete 42 hours (counting GSB 201b & 321)	21
<i>Elective Courses in Related Fields</i>	24
<i>Total</i>	<u>192</u>

Social Work

The following curriculum in the College of Liberal Arts and Sciences leads to the Bachelor of Arts degree with a major in sociology and specialization in social work.

<i>General Studies Requirements</i> (See page 9.)	96
<i>Air Science Requirement</i> (See the General Information bulletin.)	3
<i>College of Liberal Arts and Sciences Requirements</i> (See page 10.)	33
<i>Requirements for the Major in Sociology</i>	41
General Studies Area B 201-9, 321-3 (6 hours count toward the major)	(12)
General Studies Area D 108-9 (or Mathematics 220-4)	(9)
Government 232	5
Sociology 380, 383, 400, 412, 481, 482	22
Sociology electives to complete 42 hours	14
<i>Elective Courses in Related Fields</i>	19
<i>Total</i>	<u>192</u>

MINOR

A minor in sociology consists of a minimum of 24 hours.

COURSE DESCRIPTIONS

Courses in sociology are listed according to numerical order. However, the second digit in the course number indicates its field as follows:

- 00-09 General Sociology
- 10-19 Methodology and Research Techniques
- 20-29 Social Psychology
- 30-39 Social Organization and Structure
- 40-49 Family
- 50-59 Sociology of Knowledge
- 60-69 Social Disorganization and Deviance
- 70-79 Special Fields
- 80-89 Applied Fields

- 102-5 SOCIAL PROBLEMS. An analysis of selected contemporary social problems in their social and cultural setting such as crimes, suicide, mental illness, the vices, family disorganization, with emphasis upon their extent and significance.
- 305-4 SOCIAL INSTITUTIONS. Concepts of institutions; origins, development, and variability of institutions; institutional lag and change. Prerequisite: GSB 201b.
- 306-4 SOCIAL CONTROL. The means and principles of social controls; social institutions as factors in control; techniques of directing social action. Prerequisite: GSB 201b.
- GSB 321-3 SOCIALIZATION OF THE INDIVIDUAL.
- 322-3 PROPAGANDA AND PUBLIC OPINION. Techniques and characteristics of propaganda; methods of measuring public opinion. Prerequisite: GSB 201b.
- GSB 325-3 RACE AND MINORITY RELATIONS.
- 333-4 COMMUNITY ORGANIZATION. Factors involved in community organization; types, aims, and objectives; community diagnosis; individual case study of specific community. Prerequisite: GSB 201b.
- 335-4 URBAN SOCIOLOGY. The rise, development, structure, culture, planning and problems in early and modern cities. Prerequisite: GSB 201b.
- 336-4 SOCIOLOGY OF RURAL LIFE. The structure, functioning, and change of rural social life; study of informal groups, neighborhoods, and communities; social class and value orientation. Prerequisite: GSB 201b.
- 338-4 INDUSTRIAL SOCIOLOGY. Social organization and processes within the formal and informal structure of the industrial unit; research and experimental materials concerning social determinants of morale, status and role of the worker. Prerequisite: GSB 201b.
- 340-4 THE FAMILY. The family in historic and contemporary society; evolution of the modern family; changes in family functions, structures, and roles. Prerequisite: GSB 201b.
- GSB 341-3 MARRIAGE.
- 351-4 SOCIOLOGY OF RELIGION. Function of religious institutions in society and their relationship to other major social institutions; role in social control and group solidarity. Prerequisite: GSB 201b.
- 371-4 POPULATION AND MIGRATION. Quality and quantity of popula-

- tion, problems of growth, composition, distribution, differential fertility, international and internal migration, and control of numbers and quality. Prerequisite: GSB 201b or equivalent in economics, geography, or government.
- 372-4 CRIMINOLOGY. The nature of crime; criminal statistics; causal factors; theories and procedures in prevention and treatment. Prerequisite: GSB 201b.
- 373-4 JUVENILE DELINQUENCY. Nature of juvenile delinquency; factors contributing to delinquent behavior; treatment and prevention. Prerequisite: GSB 201b.
- 374-3 SOCIOLOGY OF EDUCATION. Methods, principles, and data of sociology applied to the school situation; relation of the school to other institutions and groups; may be counted either as sociology or education. Prerequisite: GSB 201b.
- 380-4 INTRODUCTION TO SOCIAL WORK. The historical development, philosophy, and theory forming the basis for the professional practice of social work; processes developed and the specialities within each of them; personal and educational requirements for the career opportunities available. Prerequisite: GSB 201b.
- 383-4 INTRODUCTION TO INTERVIEWING. Theory and practice of interviewing as a means of gaining information, and of understanding and imparting the same. Focus is on the interview as a tool in social work, but principles are generally applicable. Prerequisite: GSB 201b or c.
- 400-2 CURRENT SOCIOLOGY. Students read, report on, and evaluate content of leading sociological journals. Prerequisite: 8 hours of sociology.
- 406-3 SOCIAL CHANGE. Processes of social change in the modern world; culture lag and conflict of norms; individual and social problems arising from conflicting systems of social values and cultural norms. Prerequisite: 8 hours of sociology.
- 407-4 INTEGRATED SOCIOLOGY. Designed for senior students with a sociology major. Integration of sociological concepts and principles: society and culture, the human group, social norms and patterns, status and role, organization, structure, function, and social change. Prerequisite: 15 hours of sociology.
- 412-5 SOCIOLOGICAL RESEARCH. Introduction to methods of sociological research. Relations between theory and research design. Application of scientific methods to social data. Prerequisite: 12 hours of sociology or consent of instructor.
- 415-3 LOGIC OF THE SOCIAL SCIENCES. (See Philosophy 415.)
- 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: GSB 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: GSB 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: GSB 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 areas such as family, religion, politics. Prerequisite: GSB 201b.
- 438-3 SOCIOLOGY OF OCCUPATIONS AND PROFESSIONS. Natural history and institutional aspects of occupations in our society, cultural context of occupations in both primitive and modern society, preparation for jobs, human values in work, promotion and discharge, mobility, retirement. Prerequisite: GSB 201b.
- 449-4 SOCIOLOGY OF AGING. The social implications of an aging population; social adjustments to the aging process; personal adjustments to the roles and statuses of later maturity; a consideration of retirement and public assistance programs for older people. Prerequisite: GSB 201b or consent.
- 450-4 SOCIAL THOUGHT I: BEFORE 1800. Ancient background of Western social thought; development of modern social thought. Prerequisite: general background in history.
- 451-4 SOCIAL THOUGHT II: THE SOCIOLOGICAL MOVEMENT. Rise and development of scientific social thought in Western society. Prerequisite: background in nineteenth-century history or literature.
- 453-4 SOCIAL MOVEMENTS. A sociological study of modern social movements; social and cultural backgrounds, forms of expression and organization; social structure of social movements, their role and function in modern society. Prerequisite: 8 hours of sociology.
- 472-4 TREATMENT AND PREVENTION OF CRIME. Principles of penology; history of punishment and prisons; criminal law, police function, criminal courts; the prison community; the juvenile court and related movements. Prerequisite: 372.
- 480-2 HISTORY AND LEGAL ASPECTS OF REHABILITATION. A survey of historical and legal developments in rehabilitation agencies, with particular emphasis on current theories and trends. Open only to students in the Rehabilitation Institute.
- 481-4 PROCESSES IN SOCIAL WORK. Theory, rationale, and practice of casework, group work, social welfare organization, and the roles of supervision, administration, and research in relation to each. Case material study and discussion with field observation and practice. Prerequisite: 380 or consent of instructor.
- 482-3 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.
- 483-3 CURRENT PROBLEMS IN CORRECTIONS. (Same as Psychology 483.) An exploration of contemporary problems in the control and treatment of sentenced offenders. Prerequisite: consent of instructor.
- 484-3 SURVEY COURSE IN MARRIAGE COUNSELING. Survey and analysis of the field of marriage counseling; assessment of current practices and techniques in terms of contemporary sociological theory. Prerequisites: GSB 341 and consent of instructor.

- 486-1 to 5 INDEPENDENT STUDY IN COMMUNITY DEVELOPMENT. Supervised individual study of the literature in community development. Prerequisite: consent of Community Development Institute director.
- 487-7 (4, 3) COMMUNITY DEVELOPMENT. (a) The concepts of community development and analysis of the social-psychological forces and processes involved in citizen study, planning and action directed toward the fuller development of communities in a democratic society. (b) Principles and procedures applicable to solving social problems in the context of a community development program. Laboratory period for field trips. Must be taken in a,b sequence. Prerequisite: 4 hours of sociology or equivalent.
- 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. Some attention given to recent developments in foreign countries. Prerequisite: Consent of instructor.
- 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.
- 489d-3 PROBLEMS IN CORRECTIONAL RESEARCH. The problems of designing and conducting research in correctional institutions and agencies, a review of research trends in corrections, development of an inventory of the most critical research areas in corrections. Prerequisite: 483, 489a, or consent of the instructor.
- 489e-2 to 4 INDEPENDENT STUDY IN CORRECTIONS. Supervised readings or independent investigative projects in the various correctional aspects of crime control, institutional management, and specific correctional programs. Prerequisite: consent of instructor.
- 501-4 Survey of Sociological Theory.
- 502-4 Seminar in European Sociological Theory: 1800-1910.
- 503-4 Seminar in European Sociological Theory: 1910 to the present.
- 504-4 Seminar in American Sociology I: Foundations.
- 505-4 Seminar in American Sociology II.
- 506-4 Seminar in Contemporary Sociological Theory.
- 519-4 Methodological Foundations of the Social Sciences.
- 521-4 Seminar in Social Psychology.
- 526-4 Quantitative Methods in Sociology I.
- 527-4 Quantitative Methods in Sociology II.
- 528-4 Quantitative Methods in Sociology III.
- 529-4 Sociological Measurement.
- 530-4 Research Design.
- 531-4 Research Analysis.
- 537-4 Sociology of Law.
- 538-4 Seminar in Industrial Sociology.
- 539-4 Sociology of Bureaucracy.
- 542-4 Seminar on the Family.
- 543-4 Seminar in Family Variability.
- 544-4 Seminar in Family Research.

- 545-4 The Family and Social Change.
- 561-4 Alcohol and Society.
- 562-4 Deviance and Disorganization.
- 563-4 Research Problems in Deviance and Disorganization.
- 564-4 Social Factors in Mental Disorders.
- 566-4 Community Organization and Disorganization.
- 572-4 Seminar in Criminology.
- 582-4 Criminal Law and the Correctional Process.
- 583-4 to 12 Supervised Field Work in Corrections.
- 584-4 Seminar in Correctional Program Management.
- 586-3 The Change Agent in Planned Change.
- 587-2 to 8 Individual Research in Community Development.
- 591-2 to 6 Individual Research.
- 596-2 to 12 Readings in Sociology.
- 599-2 to 9 Thesis.
- 600-1 to 48 Dissertation.

THEATER

The Department of Theater, an academic unit of the School of Communications, offers a curriculum leading to the Bachelor of Arts degree in the College of Liberal Arts and Sciences. The curriculum and the courses are described in the bulletin of the School of Communications.

ZOOLOGY

Professors Harvey I. Fisher (Chairman), Willard M. Gersbacher, Willard D. Klimstra, William M. Lewis.
Associate Professors Richard E. Blackwelder, John C. Downey, Edwin C. Galbreath, George Garoian, Hermann J. Haas, Howard J. Stains, Hilda A. Stein (Emerita, 1963).
Assistant Professors Ronald A. Brandon, DuWayne C. Englert, William G. George, Jan Martan, Harold J. Walter.
Instructors Vernon W. Cole, Robert C. Summerfelt.

Visiting Professor Richard R. Kudo.

SUGGESTED CURRICULA IN ZOOLOGY

BACHELOR OF ARTS DEGREE, COLLEGE OF LIBERAL ARTS AND SCIENCES	
<i>General Studies Requirements</i> (See page 9.)	87
<i>Air Science Requirement</i> (See the General Information bulletin.)	3
<i>College of Liberal Arts and Sciences Requirements</i> (See page 10.)	33
<i>Requirements for the Major in Zoology</i>	74.5
General Studies Area A 201-9 (4.5 hours count toward the 48-hour major.)	(9)

Botany or physics	12
Chemistry 111-15	15
Foreign Language (French, German, or Russian)	(9)
Zoology 102, 103, 202, 300, 382-1.5, 310, 401	31.5
Zoology 303, 306, 408, 414, 461, 465 (any one)	4
Zoology electives to complete 48 hours, which may include GSA 312, 313, and 315	12
<i>Electives</i>	0
Recommended: three additional quarters of the foreign language elected, two of mathematics, one of physiology, one of microbiology, and organic chemistry	
<i>Total</i>	197.5

One who majors in zoology is expected to register consecutively in Zoology 102, 103, 202, and 300.

Zoology majors or minors who expect to enter such professions as teaching, fish and wildlife management, dentistry, medicine, veterinary medicine, or allied fields should consult with the department concerning their programs.

MINOR

A minor in zoology consists of at least 24 hours, including GSA 201-9 (which contributes only 4.5 hours); Zoology 102, 103; and at least one laboratory course numbered above 199. GSA 312, 313, 314, 315 may be counted toward the 24-hour minimum.

COURSE DESCRIPTIONS

- 102-5 GENERAL INVERTEBRATE ZOOLOGY. Studies of representatives of the various kinds of invertebrate animals. Relationships, structure, and natural history are emphasized. Prerequisite: GSA 201c.
- 103-5 GENERAL VERTEBRATE ZOOLOGY. Studies of representatives of the various kinds of vertebrate animals, with special emphasis on the amphibian type. Evolutionary development, structure, and natural history are emphasized. Prerequisite: GSA 201c.
- 202-5 COMPARATIVE ANATOMY OF THE VERTEBRATES. Comparative studies of the organ systems of vertebrate animals, with emphasis on the phylogeny and evolution of these organs. Prerequisite: 103.
- 300-5 VERTEBRATE EMBRYOLOGY. Development of the individual with the frog, chick, and pig as types. Prerequisite: 202.
- 303-4 GENERAL ORNITHOLOGY. Classification and recognition of birds and the study of their songs, nests, migratory habits, and other behavior. Prerequisite: 103.
- 306-4 ENTOMOLOGY. Principles of the structure, classification, and life histories of insects. Prerequisite: 102.

- 310-5 ANIMAL ECOLOGY. Habitats, relations, formations, and associations of animals. Cost of field trips may be \$10-\$25 per student. Prerequisites: 102, 103.
- GSA 312-3 CONSERVATION OF NATURAL RESOURCES.
- GSA 313-3 EVOLUTION.
- GSA 314-3 MAN'S GENETIC HERITAGE.
- GSA 315-3 HISTORY OF BIOLOGY.
- 316-4 INSECT PESTS AND THEIR CONTROL. Principal injurious insects and their allies; chemical and biological methods of control. (Credit may not be used toward a major in zoology.) Prerequisite: GSA 201c.
- 321-5 HISTOLOGICAL TECHNIQUE IN ZOOLOGY. Methods of preparing material for microscopic study. Prerequisite: one year of zoology.
- 322-2 to 5 PROBLEMS IN ZOOLOGY. Research on zoological problems. Prerequisite: 4.25 grade-point average, senior standing, and approval of the department. (Credit may not be used toward a minor in zoology.)
- 382-2 (1.5-2.0, 0.5, 0.5) ZOOLOGY SEMINAR FOR SENIORS. Required each term of seniors majoring in zoology. Prerequisite: senior standing.
- 400-2 ANIMAL TAXONOMY. The concepts of taxonomy and their use in zoology. Prerequisite: one year of zoology or consent of instructor.
- 401-5 GENETICS. Principles of inheritance, including genetic mechanisms, mutation, and selection. Prerequisites: 15 hours of biological science and consent of instructor.
- 402-4 NATURAL HISTORY OF INVERTEBRATES. Observation, identification, and life histories. Designed for teachers. Not for students specializing in invertebrate zoology. Prerequisite: one year of zoology, including 102.
- 403-4 NATURAL HISTORY OF VERTEBRATES. Observations, identification, and life histories. Designed for teachers. Not for students specializing in vertebrate zoology. Prerequisite: one year of zoology, including 103.
- 404-2 to 8 ZOOLOGY FIELD STUDIES. An extended trip to study animals in various environments. Arrangements made in advance. Costs per individual will be approximately \$25 per week. (4 hours may be used for undergraduate credit and 4 hours for graduate credit.) Prerequisites: senior standing, major or minor in zoology, consent of instructor.
- 406-4 PROTOZOOLOGY. Taxonomy, cytology, reproduction, and physiology of unicellular animals. Laboratory methods of culturing and studying. Prerequisites: one year of zoology, including 102, consent of instructor.
- 407-5 PARASITOLOGY. Principles, collection, identification, morphology, life histories, and control measures. Prerequisite: one year of zoology, including 102.
- 408-4 HERPETOLOGY. Taxonomic groups, identification, and natural history of amphibians and reptiles. Prerequisite: one year of zoology, including 103.
- 409-5 HISTOLOGY OF ORGANS. Microscopic structure of organs and tissues with emphasis on the mammal. Prerequisite: 202.
- 410-4 VERTEBRATE PALEONTOLOGY. History of vertebrate animals in terms of their morphological change, geological succession, and ecological relationships. Prerequisite: one year of zoology, including 202 or Geology 221.
- 412-4 ADVANCED ENTOMOLOGY. Morphology, physiology, systematics, and distribution of insects. Prerequisite: 306.

- 413-5 THE INVERTEBRATES. Structure, development, and natural history of invertebrates, except insects and parasites. Prerequisites: one year of zoology, including 102.
- 414-4 FRESH-WATER INVERTEBRATES. Taxonomic groups, identification, and natural history of the regional fauna. Prerequisites: one year of zoology, including 102.
- 441-4 ADVANCED VERTEBRATE EMBRYOLOGY. Principles of development and organization of vertebrate animals during embryogenesis, with emphasis on mammalian forms. Prerequisite: 300.
- 459-4 GAME BIRDS. Natural history and management. Prerequisite: one year of zoology, including 103.
- 461-4 MAMMALOLOGY. Taxonomic groups, identification, and natural history of mammals. Prerequisite: one year of zoology, including 103.
- 463-4 GAME MANAGEMENT. General survey of management principles and techniques. Prerequisites: 15 hours of biological science and consent of instructor.
- 465-4 ICHTHYOLOGY. Taxonomic groups, identification, and natural history of fishes. Prerequisite: one year of zoology, including 103.
- 466-4 FISH MANAGEMENT. Sampling, dynamics, and manipulation of fish populations, age and growth of fishes, and habitat improvement. Prerequisites: 15 hours of biological science and consent of instructor.
- 501-4 Animal Biology for High School Teachers of Biology.
- 502-2 Recent Developments in Biological Sciences.
- 507-8 BSCS—High School Biology.
- 508-4 Helminthology.
- 510-4 Bio-Ecology.
- 511-4 Limnology.
- 512-3 Animal Geography.
- 513-3 Advanced Ornithology.
- 520-5 Advanced Invertebrates.
- 521-4 Advanced Limnology.
- 525-5 Cytology.
- 540-3 Factors in Animal Reproduction.
- 560-3 Advanced Game Management.
- 561-4 Game Mammals.
- 566-4 Fish Culture.
- 578-4 Population Genetics.
- 579-4 Animal Behavior.
- 580-4 Advanced Systematics.
- 581-3 Readings in Current Zoological Literature.
- 582-1.5 ($\frac{1}{2}$, $\frac{1}{2}$, $\frac{1}{2}$) Graduate Zoology Seminar.
- 583-3 (1, 1, 1) The Teaching of Zoology in College.
- 584-3 (1, 1, 1) Protozoology Seminar.
- 596-3 to 12 Special Research.
- 599-2 to 9 Research and Thesis.
- 600-3 to 48 Research and Dissertation.

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