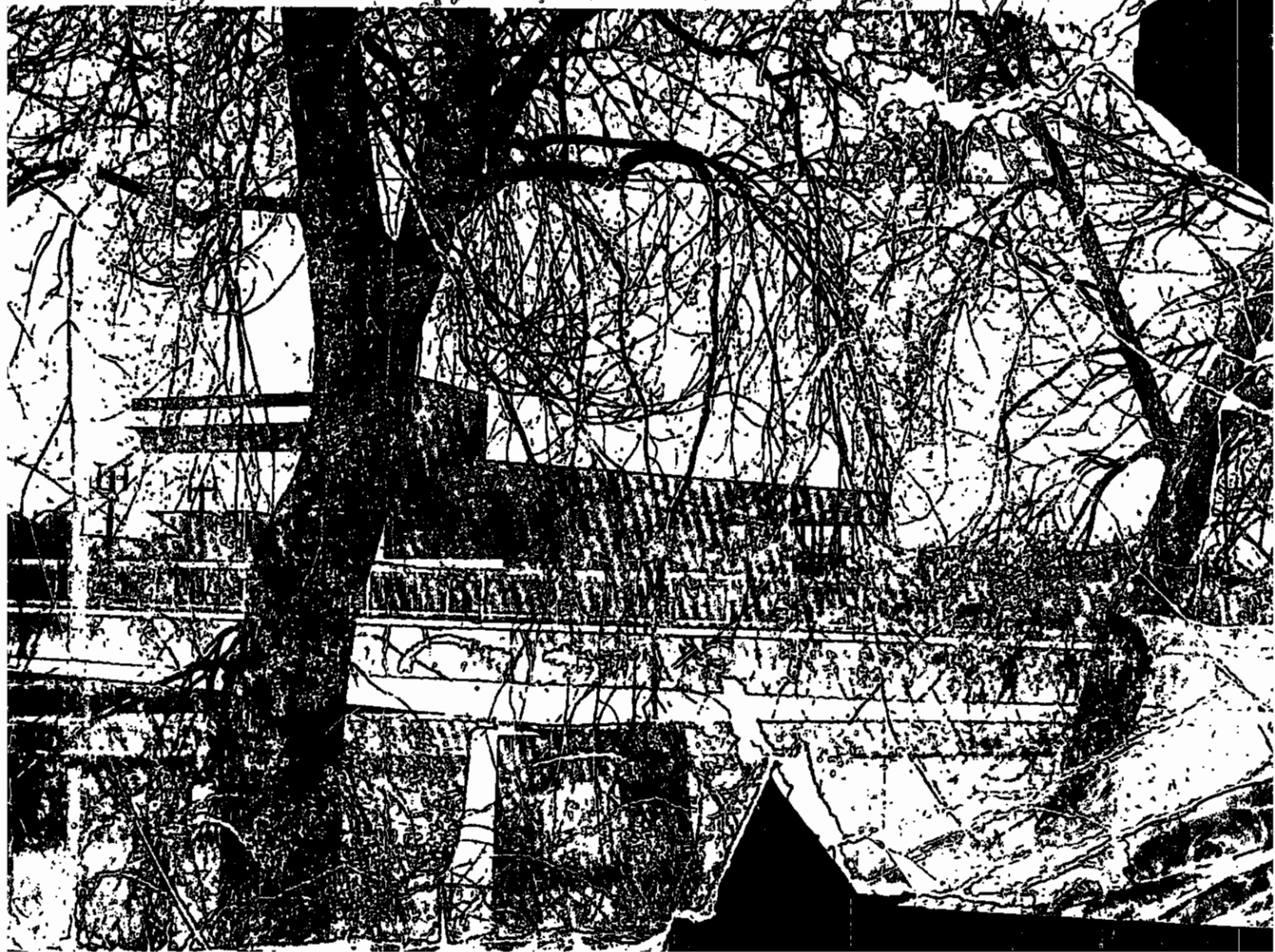


The University of Iowa Bulletin

1972'74 General Catalog



upon these several geneticists, especially for teaching, but it involves a number of other scientists whose research includes genetics.

The program is administered by an interdepartmental committee.

Staff: *professors* Brosseau (Zoology), Frankel (Zoology), Milkman (Zoology), Mohler (Zoology), Winokur (Psychiatry), Zellweger (Pediatrics); *associate professors* Chalkley (Biochemistry), Conway (Biochemistry), Six (Microbiology); *assistant professors* Carlson (Botany), Feiss (Microbiology), Gussin (Zoology), Hegmann (Zoology), Surzycki (Botany), Walker (Microbiology)

Courses

Biochemistry

99:131 Molecular Genetics 3 or 4 a.h.
Same as Zoology 37:171

Botany

2:102 Genetics 2 or 4 a.h.
Same as Zoology 37:109
2:103 Fundamental Genetics 3 or 4 a.h.
Same as Zoology 37:110
2:104 Cytogenetics 4 a.h.
2:160 Genetics of Cell Organelles cr. arr.
2:161 Eucaryotic Cell Biology 3 a.h.

Microbiology

61:170 Topics in Microbial Genetics 3 a.h.
61:270 Molecular Mechanisms in Heredity 3 a.h.

Zoology

37:101 Principles of Human Genetics 3 a.h.
37:109 Genetics 2 or 4 a.h.
Same as Botany 2:102
37:110 Fundamental Genetics 3 or 4 a.h.
Same as Botany 2:103
37:131 Evolution 4 a.h.
37:160 Advanced Genetics 4 a.h.
37:162 Population Genetics 3 a.h.
37:163 Behavioral Genetics 3 a.h.
37:165 Quantitative Genetics 3 a.h.
37:171 Molecular Genetics 3 or 4 a.h.
Same as Biochemistry 99:131
37:172 Topics in Molecular Genetics 2 a.h.
37:215 Seminar: Genetics cr. arr.
37:260 Developmental Genetics 2 a.h.
37:263 Behavioral Genetics Seminar 1 a.h.

Geography

Department Chairman: Clyde F. Kohn
Degrees offered: B.A., B.S., M.A., Ph.D.

Vanished is the legendary encyclopedia geographer crammed with isolated bits of information ranging from the capital city of Mauritania to the annual Yakima valley apple production or the height of the highest mountain in Outer Mongolia. Modern geography is concerned more with the spatial aspects of human behavior than with the memorization of rainfall data, crop production or the length of rivers. Students who elect courses in

geography soon find that geographic insights and methods of inquiry are related to the solution of many of the complex problems confronting modern societies, such as air and water pollution, traffic jams, the development of ghettos in large cities, rapidly increasing populations and conflicts between nations. An increasing number of undergraduates is discovering that a major in geography provides them with concepts and methods for organizing cities, market regions, school districts or other human institutions.

Much of modern geography is problem-oriented. It is scientific as well as humanistic in its approach to the solution of these problems. It is involved with two basic considerations: the best means to obtain accurate facts or data; and the tools and techniques necessary for analyzing these data to see if they verify or alter existing explanations for the facts as they are observed.

Modern technology has come to the aid of the profession in achieving both of these goals. Satellite instrumentation, such as radar, infra-red and visible light cameras, are being used to gather information for understanding and solving a wide range of human problems. The computer has proved to be a priceless aid in analyzing these data, which are influencing the planning of urban areas, the development of better policies and practices for the use of resources, the solution of pollution and other environment-man problems, the easing of internal and international conflicts, and many other endeavors. Today's geography is man-centered and contributes to the decision-making processes involved in determining how man can improve the quality of life in this complex age.

Career opportunities for undergraduate majors in geography exist in various branches of government and in business. There is a demand for persons capable of dealing with resource management, economic development, market area analysis and other problems related to the distribution and spatial interaction of physical, economic, social and political phenomena in the world as a whole or in major parts of it.

There is also a growing demand for young people concerned with man's perception of and his subsequent interactions with his total environment. Courses in geography are commonly required of students preparing to enter the teaching profession at the elementary and secondary school levels, of students who want to work in urban and regional planning, and as a background for many related professions, including law, hospital administration and transportation engineering.

The Undergraduate Program

The Geography faculty has attempted to build an undergraduate program which contributes to the liberal education of all undergraduate students; it provides innovative and relevant preparation of undergraduate majors for careers in which an understanding of geography is basic; and it joins in significant interdepartmental programs involving regional, urban and environmental components.

A number of geographic themes and principles compose the intellectual framework of the discipline and serve as unifying threads through all courses constituting the Department's program. The stress is on the spatial aspects of human behavior, environment-man relations, the spatial organization of territory for achieving institutional goals and the geography of particular parts of the world, such as newly developed regions.

Students electing to major in geography will be exposed to concepts and methods of inquiry in physical, economic, social and political geography, especially as they relate to urban areas. They will be taught how to state problems from a geographic point of view, where and how to find relevant data for analyzing these problems, how to relate their findings to existing theories and how to apply their findings to real-world situations.

Geography courses open to undergraduate students may be taken in any order or simultaneously; no undergraduate course in geography has any prerequisites. Most courses below the 100 level are open to freshmen.

Undergraduate students may be admitted to the major program in geography after conferring with the Department chairman.

Students majoring in geography must meet the general College of Liberal Arts skills and core requirements. Credits earned in five geography courses—44:1 Geography and Human Activities, 44:2 Natural Environment and Man, 44:11 Introduction to Social Geography, 44:19 Natural Environmental Issues, 44:30 Introduction to Economic Geography and 44:35 Introduction to Urban Geography—may be applied toward the social science core requirement.

The Bachelor of Arts and Bachelor of Science degree programs both require 26 semester hours of coursework in geography, including the Undergraduate Seminar and at least 12 semester hours in 100-level courses.

It is recommended that all complete Geography and Human Activities, and Natural Environment and Man.

With the help of their advisers, students may plan study programs which best suit their individual needs.

For example, those considering careers in urban planning, or who expect to work in an urban environment, might well take a cluster of courses including Introduction to Urban Geography, 44:115 Political Behavior and Urban Spatial Structure, 44:135 Internal Spatial Structure of Urban Areas, 44:136 Geographic Analysis of Urban Areas, 44:137 City Growth and Development and other courses related to the study of urban structure and functions.

Students interested in problems relating to ecology might elect Natural Environment and Man, Introduction to Social Geography, Natural Environmental Issues, 44:101 Introduction to Weather and Climate, 44:116 Political Ecology, 44:120 Natural Hazards and 44:122 Natural Habitats of the United States.

All undergraduate students majoring in geography must take a course in statistics, such as 22S:43 Introduction to Statistical Methods, or its equivalent, such as 44:108 Quantitative Methods or 34:11 Theory, Research and Statistics.

Students in the B.S. program must also complete 22M:25 Calculus or its equivalent.

Students who want professional careers in geography are urged to complete the B.S. program. Those contemplating careers in foreign service should complete three years' study of the appropriate foreign language.

The Association of the American Geographers publishes a monthly bulletin, *Jobs in Geography*.

The Graduate Program

The goals of the Department at the graduate level are to prepare graduate students to carry on creative and productive research

in geography involving the use of theory, modeling and formal verification methods; to prepare students at both the M.A. and Ph.D. levels for positions to which they aspire in research, teaching or some area of applied geography; and to help students develop their ability to apply knowledge of facts, theories and methodology to specific societal programs. The achievement of these goals is demonstrated in large measure by the demand for Iowa graduates to fill positions on college and university faculties, in research-oriented institutions and in business and government.

The graduate program at Iowa is concerned with the locational analysis of physical, economic, social and political phenomena; the spatial aspects of human behavior; and the interaction of man and his environment.

To develop concepts, models and theories which facilitate the study of these basic aspects of geography, the Department offers a graduate program of courses and seminars at the intermediate and advanced levels and directs research efforts of qualified students. In addition, courses have been developed to provide graduate students with the technical skills necessary for geographic analysis of human activities and the environments in which they take place. Special attention is given to the utilization of theory and the construction of models in analyzing human behavior in urban areas and in selected regions.

In determining the admission of a student to the graduate program, the Geography Department considers the total record of each student individually. In addition to the general rules and regulations set forth in the *Manual of Rules and Regulations of the Graduate College*, the Department considers the student's undergraduate grade-point average, especially during his or her junior-senior years; his or her scores on the Graduate Record Examination Aptitude Test; letters of recommendation from those with whom he or she has taken courses; and an essay in which the applicant sets forth the reasons for wanting to continue his or her study of geography at The University of Iowa.

Students with undergraduate grade-point averages between 2.5 and 2.75 will be admitted for the M.A. degree on condition only. They must achieve a grade-point average of 2.75 or better on their first 12 hours of graduate work, as approved by the Department, in order to remain as graduate students. Foreign students and others from undergraduate institutions which evaluate students on a basis other than grade-point averages will be considered according to their relative academic standing in their respective institutions.

All M.A. students are required to complete a minimum of 30 semester hours of graduate work, including 44:108 Quantitative Methods I, 44:201 and 44:202 Geographical Analysis I and II.

A maximum of six semester hours of credit may be earned by the satisfactory completion of a thesis for those who wish to take the M.A. degree with thesis. The remainder of both M.A. programs may be composed of graduate level courses or research seminars, as approved by the faculty.

All M.A. students must pass a final examination.

Students whose objective is the Ph.D. degree are required to complete 44:108 Quantitative Methods, 44:201-202 Geographical Analysis I and II, and 208 Advanced Quantitative Methods, preferably during the first year in residence. However, the student may meet these course requirements with a satisfactory

performance in written examinations during the first week of the first semester for which he or she registers.

All doctoral students must also complete two research seminars, preferably during their second year in residence, under the direction of different faculty members. They are also required, unless excused by the faculty, to register for 44:350 each semester while in residence. During the academic year, one semester hour of credit will be awarded each semester on an S-U basis for this course. The remainder of the Ph.D. program includes appropriate graduate courses, seminars and research in geography, depending on the interest of the student; courses in disciplines closely related to the student's objectives and interests; and courses which satisfy the tool requirements.

Programs for students who wish to study for the Ph.D. in geography are established separately for each student. For this reason, as soon as possible after beginning graduate work, doctoral students are urged to declare a general area of specialization within the discipline and to secure a faculty adviser. During the second year in residence, if possible, the doctoral student should declare a specific field of specialization within his or her general area of interest.

Preferably during his or her second year in residence, and no later than the fifth semester, the doctoral student must, with the approval of his or her adviser, submit one of his or her own research papers to the faculty, who will pass upon the merits of the research demonstrated therein. Such a paper is commonly referred to as a Qualifying Paper.

Research tool requirements for the Ph.D. candidates are of two kinds. One is the course 44:208 Advanced Quantitative Methods; the other may be satisfied by completing any other appropriate course, as approved by the faculty at the time the student declares his or her specific area of specialization.

To become a candidate for the Ph.D. degree, the student is required to pass a comprehensive examination consisting of written and oral parts, in which he or she demonstrates analytical proficiency with respect to his or her major area of specialization and a general knowledge of the discipline, including both content and methodology. Upon passing the comprehensive examination, the doctoral candidate will prepare a research design to be presented before the staff seminar. After the design is approved by the faculty, the candidate is expected to conduct the necessary research and analysis, and to present his or her findings in an approved dissertation which must be defended in a final oral examination.

All doctoral candidates are expected to have supervised experiences as classroom instructors and research assistants before being awarded the Ph.D. degree.

Innovations in Teaching

During the past year or two, faculty members have initiated some interesting changes in their teaching strategies, in order to improve their instruction and to develop greater student interest and participation.

Courses have been re-oriented, from an emphasis on a body of knowledge to be learned to the development of problem-solving abilities. Attempts are being made to break with the well-established teaching procedures, such as the "lecture-reading-test" syndrome.

In some instances, lectures are no longer the focus of a course.

Rather, lectures are built around the activities to be performed in the discussion-laboratory periods. So, too, are the reading assignments. In other instances, the lectures, laboratories, discussions, readings, papers and examinations are being used in such a way as to achieve new goals. There is also interest in the development of a series of computer-program units for use in several undergraduate courses. As a result of these innovations, several courses have been ranked above average in the Course-Instructor Evaluation program sponsored by the Student Association Senate during recent years, and enrollments in all courses have increased.

Research Productivity

Since its origin, the Iowa Department of Geography has made significant contributions to the advancement of research in geography and is continuing to do so. It was among the first in the country to adapt the scientific method to geographic research; to use quantitative methods in the analysis of the location and distribution of natural and cultural phenomena over the earth's surface; and to develop mathematical models and geographic theory. In most instances, the research program of the Department produces an immediate feed-back to the instructional program. Thus, the content of both undergraduate and graduate courses reflects the latest advances in the discipline, both in content and methodology.

Rating of Department

In its recent evaluation of graduate departments, the American Council on Education ranked the Iowa Department of Geography as "strong." The Department was also included in the list of 15 "leading" departments of geography in the nation.

The Faculty

Individual faculty members participate in University, local, state, national and international groups whenever significant work can be made of their special professional competencies. They give time and energy to professional organizations and have served as executive officers, as members of governing boards and as review and consulting editors for the Association of American Geographers, the National Council for Geographic Education, the Regional Science Association, the International Geographical Union and the National Council for the Social Studies.

Relations with Other Departments

In both their instructional and research efforts, members of the Geography faculty work closely with their colleagues in other departments within the College of Liberal Arts, as well as in other divisions of the University, and especially with the Institute of Urban and Regional Research. The Department's interest in problems relating to the environment and man, for example, has led to cooperation in the establishment of interdisciplinary courses and research projects with other departments in both the natural and social sciences, as well as in the schools of Engineering, Medicine and Law.

The Map Library

Housed on the third floor of the Main Library, the Map Library contains more than 56,000 maps, a total of 1,820 atlases and reference works, and about 60,000 aerial photographs, primarily of Iowa. The map collection in the Library is a depository library for maps of the U.S. Army Topographic Command, formerly Army Map Service. The Geology Library contains approximately 40,000 maps, including both geologic maps and U.S. Geological Survey topographic maps. The Department of Geography has its own collection of topographic maps, maps of large urban centers and supply of aerial photographs for use by students in working out laboratory exercises.

In recent years, the Department has been fortunate in receiving grants for supporting research and service activities. Many of these grants include funds for supporting research and other assistants.

Staff: *professors* Kohn, Horton; *associate professors* Dueker, Lindberg, McNulty, Reynolds, Rushton, Salisbury; *assistant professors* Gardner, Mercer

Courses Primarily for Undergraduates

- 44:1 Introduction to Human Geography** 4 a.h.
Application of geographic principles to contemporary social, economic and political problems; urban growth; problems of ghetto; diffusion of innovations; territoriality and perception; open to freshmen
- 44:2 Natural Environment and Man** 4 a.h.
Spatial distribution of the world's natural resources, including climate, water, landforms, soils, vegetation and minerals; man's role in defining nature of resource base; regional problems in resource use, environmental pollution and natural hazards; open to freshmen
- 44:11 Introduction to Social Geography** 4 a.h.
Problems related to distribution and growth of population; man in relation to his social environment; spatial aspects of social systems, including education, religion, recreation, medical and social services; diffusion of ideas and traits over space; social change and social policies viewed spatially; open to freshmen
- 44:19 Natural Environmental Issues** 2 a.h.
Issues arising from man's use of natural environment and related problems resulting from expanding world population: air, water and land pollution; population pressures on agricultural resources; energy and mineral resource requirements versus quality of environment; open to freshmen
- 44:30 Introduction to Economic Geography** 4 a.h.
Location and spatial organization of world's major types of economies: agriculture, mining, transportation, manufacturing, service occupations and patterns of consumer behavior; open to freshmen
- 44:35 Introduction to Urban Geography** 4 a.h.
Processes of urbanization and city growth; spatial structure and pattern of urban activities; geographic considerations of contemporary urban problems; the city and its physical setting; comparative urban studies; open to freshmen
- 44:50 Undergraduate Seminar for Geography Majors** 2 a.h.
Nature of geography as professional field; geographic methods of analysis; research in geography; students prepare a research paper; required of all undergraduate majors in their senior year; open only to undergraduate majors in geography; prerequisite: approval of faculty member with whom student wishes to study
- 44:80 The World of Wine** 2 or 5 a.h.
Production, distribution and consumption of wines throughout the world, with emphasis on quality of wine as related to landforms, soils, weather conditions and aging; a three-week field trip of vineyards of selected European countries planned for those who elect the course for five semester hours of credit; field trip scheduled for three weeks immediately following the end of spring examination period in May; open only to juniors and seniors
- 44:90 Geography of the Third World** 3 a.h.
Geographic patterns and processes of underdevelopment; spatial implications of colonialism and neo-colonialism; alternate concepts of spatial planning in third world; open only to juniors and seniors
- 44:91 Geography of a Divided World** 3 a.h.
World divided by differences in natural, economic, social and political values and systems; major cultural regions of the world, as characterized by their reactions to impact of revolutionary changes now in process; open only to juniors and seniors

Courses for Undergraduates and Graduates

- 44:100 Readings in Geography** cr. arr.
Students who have completed appropriate number of geography courses and have interest in pursuing specific topic of their choice may do so by registering for supervised readings in geography; permission of faculty member who is to supervise student's work required before registration
- 44:101 Introduction to Weather and Climate** 3 a.h.
Spatial distribution of weather elements, wind circulation, air masses, storms and general world climatic conditions, including air pollution and climatic change; laboratory work in study of weather maps and climatic data
- 44:106 Geography in the School Curriculum** 3 a.h.
Concepts and content of geography essential to effective educational programs; methods of geographic inquiry; use of audio-visual media in teaching geography
- 44:108 Quantitative Methods I** 3 a.h.
Mathematical and statistical techniques in current research in geography
- 44:115 Political Geography in Cities** 3 a.h.
Political organization of urban areas and the problems and impact of reform; locational decisions and conflict situations in metropolitan areas
- 44:116 Political Ecology** 3 a.h.
Social science perspectives on relationships between the political behavior of individuals, groups and systems, and the structures of their social, cultural, political and economic environments; theories of political and spatial organization based on assumptions of political and economic rationality
- 44:119 Natural Environmental Issues** 2 a.h.
Issues arising from man's use of the natural environment and related problems resulting from an expanding world population: air, water and land pollution; population pressures on agricultural resources; energy and mineral resource requirements versus the quality of the environment
- 44:120 Natural Hazards** 3 a.h.
Man-environment relationships under extreme environmental conditions; causes, characteristics and consequences of extreme events such as earthquakes, tornadoes, blizzards, droughts and floods; human adjustments to these events, ranging from immediate responses like denial of occurrence and evacuation to long-term responses like forecasting, flood control, zoning and insurance
- 44:121 Stream Processes and Landforms** 3 a.h.
Hydrology of drainage basins, and role of running water and mass movement in shaping form of land surface
- 44:122 Natural Resources of the United States** 3 a.h.
Nature, pattern and interdependence of elements of the natural resource base; land, water and soil as habitats for man and biological communities
- 44:130 Location of Economic Activities** 3 a.h.
Historical and contemporary forces affecting location of economic activities; problems of providing services to dispersed and socially segregated populations in both United States and in developing countries; extrapolation of trends in spatial distribution of agricultural, manufacturing and service activities in both world and national scales
- 44:132 Industrial Location** 3 a.h.
Theory and practice of manufacturing location, and its application to different industries and types of economy, with investigations of selected case studies
- 44:135 Urban Geography** 3 a.h.
Models of urban growth and urban forms; spatial patterns of selected activities; processes that generate these patterns; current problems
- 44:136 The Inner City** 3 a.h.
Residential segregation of minority groups; spatial structure of "ghetto" areas; environmental quality of inner city neighborhoods; spatial aspects of problems of economic and social stress
- 44:137 City Growth and Development** 3 a.h.
Processes and policy considerations related to urban growth and change; theoretical and operational strategies employed in identifying and forecasting change in urban morphology and activity locations within cities
- 44:138 Spatial Organization** 3 a.h.
Theories, methods and substantive findings concerning spatial organization of human activities; space-serving systems; spatial diffusion of innovations; spatial differences in neighborhoods in cities; spatial choice patterns of individuals; space preferences and mental maps
- 44:141 United States and Canada** 3 a.h.
Methods of analysis of regional economic and social development with specific applications to regions of United States and Canada
- 44:161 Africa** 3 a.h.
Spatial aspects of development in Africa; geographical interpretations of selected problems confronting African nations
- 44:190 Perspectives of Man-Environment Issues** cr. arr.
Relationships between man's social behavior and biological and physical aspects

of his environment; impact of technology on environment; technological, economic, political and behavioral solutions to environmental problems; same as 113:191

Courses for Graduates Only

- 44:201 Geographical Analysis I** 3 s.h.
Past and present philosophies of geography in light of philosophical developments in science in general; critical review of research literature of the past
- 44:202 Geographical Analysis II** 3 s.h.
A critical examination and evaluation of recent methodological and theoretical developments in geography; prerequisite: 44:201
- 44:208 Advanced Quantitative Methods** 3 s.h.
Mathematical and statistical techniques in current geographical research with emphasis upon employment of computer and development of research designs; prerequisites: knowledge of computer programming and 44:108, its equivalent or consent of instructor.
- 44:215 Locational Analysis of Political Behavior** 3 s.h.
Locational basis of political and quasipolitical behavior at individual and various systems level; spatial dimensions of electoral behavior; aspects of political modernization; urban public policy making; prerequisites: 44:202, 44:208 or consent of instructor
- 44:216 Behavioral Analysis in Geography** 3 s.h.
Various behavioral model-building strategies pertaining to spatial behavior and spatial structure with emphasis on environmental perception approaches; prerequisite: 44:108, 44:202 or consent of instructor
- 44:230 Locational Analysis of Economic Behavior** 3 s.h.
Classical theories for the location of economic activities contrasted with alternate approaches of spatial analysis school of economic geography; contemporary efforts to develop behavioral models of decision-making contrasted with mathematical programming and heuristic programming approaches to solution of spatial allocation problems; prerequisite: 44:202, 44:208, 44:130 or consent of instructor
- 44:235 Spatial Structure of Residential Areas** 3 s.h.
Behavioral processes as related to spatial patterns of residential areas; processes of residential site selection and attributes of residential areas; linkages between residential areas and other elements of urban areas; prerequisites: 44:108, 44:202 or consent of instructor
- 44:236 Travel Behavior in Urban Areas** 3 s.h.
Theoretical and conceptual basis of urban travel behavior; current models of travel behavior; interaction between intraurban spatial structure and travel behavior; new research strategies and experimental behavioral models helpful in gaining insight into urban travel behavior processes; prerequisites: 44:108, 44:202 or consent of instructor
- 44:261 Geographic Perspectives on Development** 3 s.h.
Theoretical and empirical studies of the development process, with special emphasis on spatial implications of socio-economic changes attendant upon development; prerequisites: 44:108, 44:202 or consent of instructor
- 44:262 The Evolution of Human Ecology** 2-3 s.h.
Human adaptation, physiological and sociological responses; exploitation of past and present environments, as exemplified in central Africa, Beringia (Alaska-Siberia) and mid-western North America, examined from time of appearance of man to present; climatic and geographical limitations on man as an individual physiological entity and social animal; same as 113:262, 12:262 and 72:262
- 44:280 Field Techniques in Physical Geography** 3 s.h.
Sampling procedures and collection of field data in physical geography, together with laboratory analysis of data
- 44:308 Research Seminar: The Teaching of Geography** cr. arr.
- 44:308 Research Seminar: Quantitative Methods, Computer Methods and Modeling** cr. arr.
- 44:311 Research Seminar: Geographic Analysis of Social Behavior** cr. arr.
- 44:315 Research Seminar: Locational Analysis of Political Behavior** cr. arr.
- 44:316 Research Seminar: Space Perception** cr. arr.
- 44:318 Research Seminar: Quaternary** cr. arr.
- 44:319 Research Seminar: Physical Geography** cr. arr.
- 44:320 Research Seminar: Natural Hazards and Problems** cr. arr.
- 44:330 Research Seminar: Geographic Analysis of Economic Behavior** cr. arr.
- 44:331 Research Seminar: Location Theory** cr. arr.
- 44:335 Research Seminar: Urban Housing, Redevelopment and Renewal** cr. arr.
- 44:336 Research Seminar: Urban Travel Behavior** cr. arr.
- 44:337 Research Seminar: City Growth and Development** cr. arr.

- 44:338 Urban Transportation Issues** 3 s.h.
Same as Urban and Regional Planning 102:226
- 44:339 Urban Information Systems** 3 s.h.
Same as Urban and Regional Planning 102:227
- 44:350 Staff Seminar** cr. arr.
- 44:380 Field Seminar** cr. arr.
- 44:406 Research: The Teaching of Geography** cr. arr.
- 44:408 Research: Quantitative Methods, Computer Methods and Modeling** cr. arr.
- 44:419 Research: Physical Geography** cr. arr.
- 44:440 Research: Environment and Behavior** cr. arr.
- 44:441 Research: Locational Analysis** cr. arr.
- 44:442 Research: Models of Spatial Behavior** cr. arr.
- 444:450 Thesis** cr. arr.

Geology

Department Chairman: Brian F. Glenister
Degrees offered: B.A., B.S., M.S., Ph.D.

Geology is the theoretical and practical application of all scientific disciplines to the study of the earth. How the earth was formed, what it looks like now and how man is changing it for future generations—all are geological concerns.

Career opportunities are available to professional geologists in industry, teaching, urban planning, geological and resource surveys, government and research organizations. The master's degree is regarded by most hiring agencies as the working degree in geology. However, an undergraduate degree is fully satisfactory in certain teaching, federal and industrial situations.

About half of Iowa's baccalaureate graduates in geology find jobs in the petroleum industry as exploration geologists. Most of the rest go on to graduate school or take jobs with government conservation agencies. Some intend to enter law, medicine or business. Others are interested in urban planning, environmental studies, engineering, archeology, science education or oceanography as advanced areas. Geology is suited to all these.

The program at Iowa stresses theoretical geology and paleontology more than the engineering or agricultural phases of the discipline. The Department specializes in relating scientific thought to the study of the earth. Geology majors receive at least an academic year's work in basic scientific areas—physics, biology, chemistry and mathematics—in addition to a course in each major area of geology.

Each year more than 1,400 students enroll in Earth History and Resources, a team-taught, laboratory-discussion-lecture course designed to fulfill the College of Liberal Arts requirement for natural science core studies.

Other offerings for nonmajors include a lecture sequence for persons interested in a general survey of geology and several advanced courses without prerequisites—paleontology, geology of Iowa, history of the vertebrates, a planet in crisis, minerals and world affairs, landforms.

The Undergraduate Programs

The Bachelor of Science Degree

The Bachelor of Science program is designed primarily to prepare students for graduate study and for employment in industry. Required courses in the B.S. program fall into four categories: