

GENERAL CATALOG

1996-1998

THE UNIVERSITY OF IOWA
Iowa City, Iowa 52242

Produced by University Relations and the Office of the Registrar

Even more important than formal course work is the opportunity to do significant research in genetics. Students are encouraged to begin their own research as quickly as possible. Research interests of the participating faculty include virtually all areas of genetics, ranging from bacteriophage genetics to human medical genetics. In each area of genetics, there is a group of faculty members who have closely related interests.

The University is also strong in several related disciplines, including microbial physiology, enzymology, virology, protein biochemistry, and developmental and cell biology, all of which contribute significantly to the overall training program.

In addition to completing research and course work, students must pass a comprehensive examination, usually at the end of their second year in the program.

Admission

Prospective doctoral students in genetics should have a strong undergraduate background in science, including courses in general genetics, organic chemistry, biochemistry, introductory physics, and mathematics, as well as a strong commitment to genetic research and teaching. Students can make up deficiencies in a particular area during their first year of graduate study.

Admission to the program is based on assessment of applicants' undergraduate academic record, performance on the Graduate Record Examination (GRE) Aptitude Test (verbal and quantitative), and letters of recommendation. Admission requirements are not rigid. Most students currently working toward the Ph.D. in genetics at The University of Iowa have undergraduate grade-point averages higher than 3.50, and their GRE Aptitude Test scores (verbal plus quantitative) exceed 1250. Students with lower grade-point averages or GRE scores may be admitted, depending on other indications of academic potential.

The program accepts applications for admission at any time, but students generally begin graduate work during the fall semester.

Financial Aid

All genetics graduate students currently receive a financial stipend that is in the range of \$13,545 plus tuition per year. By April 1, nearly all financial aid is committed for students entering in the fall.

Financial support comes from research assistantships, teaching assistantships, scholarships, individual research grants, or other departmental or college funds. All students are required to do some teaching as part of their development as future scientists and faculty members.

Medical Scientist Training Program

Students may combine study toward an M.D. and a Ph.D. in genetics. Information about this program is available from the director of the Medical Scientist Training Program in the College of Medicine.

Departmental Ph.D. Programs

The Departments of Anatomy, Biochemistry, Biological Sciences, Physiology and Biophysics, and Microbiology offer degree programs in which students may specialize in a particular aspect of genetics. See the appropriate departmental sections in the *Catalog* for information about these programs.

Associated Courses

The following genetics courses are open to graduate students. Not all courses are offered every year.

2:125 Cytogenetics	2 s.h.
2:131 Evolution	4 s.h.
2:162 Population Genetics and Molecular Evolution	3 s.h.
2:164 Topics in Plant Molecular Biology	1-2 s.h.
2:168 Developmental Genetics	4 s.h.
2:171 Molecular Genetics	4 s.h.
2:172 Topics in Molecular Genetics	1-2 s.h.
2:176 Topics in Eukaryotic Molecular Biology	2 s.h.
2:179 Topics in Molecular Evolution	2 s.h.
2:195 Pattern Formation in Development	2 s.h.
2:205 Graduate Lectures in Genetics	1 s.h.
2:210 Topics in Nematode Development Genetics	1-2 s.h.
2:232 seminar: Molecular Genetics	2 s.h.
61:179 Bacterial Diversity	4 s.h.
61:250 Topics: Bacterial Molecular Pathogenesis	2 s.h.
61:268 Molecular Biology of Animal Viruses	3 s.h.
70:161 Human Genetics	2 s.h.
72:245 Developmental Neurobiology	2 s.h.
99:237 Topics in Biochemistry	1 s.h.
142:210 Molecular Biology I (prokaryotic)	4 s.h.
142:215 Molecular Biology II (eukaryotic)	3 s.h.
142:220 Cell Biology I	3 s.h.
142:225 Cell Biology II	3 s.h.

Courses

127:191 Human Molecular Genetics 3 s.h.
Molecular genetic approaches to human disease; the human genome project, linkage analysis, candidate gene screening, special features of inbred populations, triplet repeat expansions, mitochondrial genetics, genetics of complex traits; literature-based. Prerequisites: fundamental genetics, molecular biology, or consent of instructor.

127:270 Ethics and Responsible Conduct in Research 1 s.h.
Conducting and reporting of research, peer review, mentoring and laboratory supervision, human and animal subjects, misconduct, conflict of interest. Same as 132:270, 142:270, 148:270.

127:301 Graduate Research in Genetics arr.

GEOGRAPHY

Chair: Rebecca S. Roberts

Professors: John W. Fuller, James B. Lindberg, George P. Malanson, Michael L. McNulty, R. Rajagopal, David R. Reynolds, Gerard Rushton
Associate professors: Marc P. Armstrong, Rex D. Honey, Frank H. Weirich, Rebecca S. Roberts
Assistant professor: Claire Pavlik
Adjunct faculty Paul Densham, David E. Osterberg
Undergraduate degrees: B.A., B.S. in Geography; minor in Geography
Graduate degrees: M.A., Ph.D. in Geography

Geography is concerned with "place" or "environment" and ongoing forces that promote change within and between human and physical systems. The discipline seeks to explain spatial organization and areal differentiation through detailed studies of significant patterns and processes. Geography is a composite science, requiring a broad base of knowledge from many related disciplines. It also is an analytical science that seeks answers to specific research questions from a distinctly geographic perspective.

Students of geography find that they develop insights and methods of inquiry that are particularly applicable to understanding many of the complex problems confronting societies. For instance, the distribution and consumption of natural resources, air and water pollution, processes and management of natural environments, growth and development of urban areas, increasing populations, transportation problems, spatial inequalities, location of services, and conflicts between nations are some of the issues dealt with by geographers.

Studies in geography also provide students with concepts and methods for organizing urban areas, marketing regions, school districts, health service areas, drainage basins, and other areas of concern. Thus, geographers can make substantial contributions toward understanding the behavior of individuals and of societies and their relations with the environment.

Career opportunities for majors in geography exist in many branches of government and in business. In demand are persons capable of dealing with resource management, regional development, market area analysis, and problems in distribution and spatial interaction of physical, ecological, economic, social, and political phenomena.

Courses in geography are commonly required of students preparing to teach at the elementary and secondary school levels, those who want to work in urban and regional planning, and as a background for many related professions, including law, health care, environmental or transportation engineering, and business administration.

Undergraduate Programs

The geography faculty has developed an undergraduate instructional program that serves students majoring or minoring in geography as well as those in other disciplines who are interested in taking geography courses as part of a liberal education. The department also participates in interdepartmental programs that

have global, urban, and environmental components.

Bachelor's Degrees

Each student majoring in geography selects one of the following three concentration areas: urban and regional studies, international development studies, or environmental studies.

Majors may work toward either a Bachelor of Science or a Bachelor of Arts. Students who plan advanced training or careers in geography should elect the B.S. Those with a liberal arts objective may elect either the B.A. or B.S. Transfer students must earn at least 15 semester hours of geography course work in residence at The University of Iowa.

Note: Requirements for the major in geography were changed in 1996. All students who declare a geography major beginning August 26, 1996, must complete the new requirements. Students who declare a geography major before August 26, 1996, may choose to complete either the new or the old requirements (see the 1994-96 **General Catalog**). Students who wish to use the old requirements must complete the major and graduate by August 2000.

General Requirements

All geography majors must complete the following courses.

44:1 Introduction to Human Geography	4 s.h.
44:3 Introduction to Earth Systems Science	4 s.h.
44:75 Introduction to Cartography	2 s.h.
44:85 Introduction to Economic and Social Statistics	3 s.h.
44:108 Introduction to Geographical Computing	3 s.h.
44:150 Undergraduate Seminar for Geography Majors	3 s.h.

Bachelor of Arts students must satisfy a mathematics requirement consisting of any college-level mathematics course of 3 semester hours or more, except 22M:1, 22M:2, or 22M:3.

Bachelor of Science students must satisfy a mathematics requirement consisting of one of the following sequences.

22M:15-16 Mathematics for the Biological Sciences/Calculus for the Biological Sciences	8 s.h.
22M:25-26 Calculus I-II	8 s.h.
22M:35-36 Engineering Calculus I-11	8 s.h.

All geography majors must complete one of the three course sequences described under "Urban and Regional Studies," "International Development Studies," or "Environmental Studies." Students must pay close attention to the prerequisites of the intermediate and advanced courses in each sequence so that they can develop a program of study that ensures timely satisfaction of required courses' prerequisites.

GIS EMPHASIS

The University has established a Geographic Information System (GIS) instructional facility. Housed in the Department of Geography, the facility consists of a networked system of

student workstations. Students who wish to gain additional experience in the theory and application of geographic information systems (GIS) should take 44:113 Principles of Geographic Information Systems and at least 6 more semester hours in GIS-related courses in geography and cognate fields.

Urban and Regional Studies

The undergraduate program in urban and regional studies is designed for students who are preparing for positions in government and private business, graduate programs in geography, or professional programs such as urban and regional planning, business administration, or policy analysis. The program provides a thorough understanding of the processes of urban and regional development; the roles of elites, institutions, and social movements in effecting change; and the processes through which policy decisions are reached. Courses cover economic theories of location, methods of locational analysis and modeling, regional political economy, and theories of community conflict and social change.

Students develop requisite skills in quantitative analysis and the development, management, and application of geographic information systems and computer methods. They have opportunities to work on applied problems, such as assessing sites for development potential, identifying the best locations for service facilities, evaluating urban and regional transport systems, and forecasting the populations of small areas.

Students concentrating on urban and regional studies are required to complete the following sequence of courses.

INTRODUCTORY COURSES

At least one of these:	
44:11 Introduction to Social Geography	3 s.h.
44:15 Introduction to Political Geography	3 s.h.
44:30 The Global Economy	3 s.h.

INTERMEDIATE COURSES

At least two of these:	
44:132 Industrial Location	3 s.h.
44:133 Introduction to Economics of Transportation	3 s.h.
44:135 Urban Geography	3 s.h.

ADVANCED COURSES

Students are required to take at least one course each from group A and B.

Group A:	
44:131 Medical Geography	3 s.h.
44:134 Methods of Transportation Analysis	3 s.h.
44:137 Economic Theory of Location	3 s.h.
44:139 Locational Models and Spatial Decision Support Systems	3 s.h.
Group B:	
44:161 African Development	3 s.h.
44:166 Contemporary Europe: Interaction and Change	3 s.h.
44:171 Regions and Regionalism in North American Society	3 s.h.
44:176 Social Consequences of Global Change	3 s.h.

International Development

The undergraduate program in international development studies is designed for students interested in the processes of economic, social, and political development, particularly as they affect Third World countries. This concentration gives students a better understanding of regional and national development in international and cross-cultural perspective. Students who are interested in the problems of developing countries and who wish to examine competing theories of development intended to explain international and regional inequalities will find this concentration helpful.

Students concentrating on international development studies are required to complete the following sequence of courses.

INTRODUCTORY COURSES

At least one of these:	
44:11 Introduction to Social Geography	3 s.h.
44:15 Introduction to Political Geography	3 s.h.
44:30 The Global Economy	3 s.h.

INTERMEDIATE COURSE

44:94 International Development	3 s.h.
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ADVANCED COURSES

44:194 Geographic Perspectives on Development	3 s.h.
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At least two of these:	
44:162 Geography of Underdevelopment	3 s.h.
44:163 Geography of the Newly Industrializing Countries	3 s.h.
44:172 Development Planning and Policy	3 s.h.
44:176 Social Consequences of Global Change	3 s.h.

One of these:	
44:161 African Development	3 s.h.
44:166 Contemporary Europe: Interaction and Change	3 s.h.

Environmental Studies

The undergraduate program in environmental studies is designed for students interested in the environment from either a social or a physical perspective. They may have career expectations or personal interests in resource management, physical geography, environmental policy or law, global environmental change, sustainable development, or other environmental issues. Career goals may involve environmental and earth sciences such as geomorphology or landscape ecology; environmental planning and regulation; or environmental law, policy, and politics. The program stresses the interrelationships among social and natural processes affecting the environment.

Training in field observation, quantitative analysis, computer methods, and cartographic representation are included in this concentration. The program also provides a sound foundation for graduate- or professional-level studies in either the natural or social aspects of the environment.

Students concentrating in environmental studies must complete the following sequence of courses. They must take all of the introductory

courses, 15 semester hours of a combination of intermediate and advanced courses, and a cognate cluster of 12 semester hours.

INTRODUCTORY COURSES

- 29:5 Chemistry and Physics of the Environment (or a more advanced course in chemistry or physics) 3 s.h.
44:19 Contemporary Environmental Issues 3 s.h.

INTERMEDIATE COURSES

- 44:101 Climatology 3 s.h.
44:102 Earth Surface Processes 3 s.h.
44:103 Biogeography 3 s.h.
44:104 Environment and Development 3 s.h.
44:121 Natural Resources Policy 3 s.h.
44:122 Environmental Conservation in the United States 3 s.h.

ADVANCED COURSES

- 44:123 Landscape Ecology 3 s.h.
44:124 Gender and the Environment 3 s.h.
44:125 Environmental Impact Analysis 4 s.h.
44:126 Wetlands: Function, Geography, and Management 3 s.h.
44:127 Environmental Quality: Science, Technology, and Policy 3 s.h.
44:128 Drainage Basin: Form and Process 3 s.h.
44:129 Water Resources Management 3 s.h.
44:136 Transportation and the Environment 3 s.h.
44:180 Field Methods: Physical and Environmental Processes 2-4 s.h.

RELATED COURSE WORK

Under the direction of an adviser, students should choose at least 12 semester hours of courses from one of the following clusters. Other relevant courses may be substituted for the courses listed here, with the adviser's consent.

Biophysical Systems

- 2:100 Land Plants: An Evolutionary Survey 4 s.h.
2:111 Plant Ecology 4 s.h.
2:116 Field Ecology 4 s.h.
2:119 Plant-Animal Interactions 4 s.h.
2:134 Ecology 4 s.h.
12:108 Introduction to Oceanography 2 s.h.
12:110 Introduction to Remote Sensing 4 s.h.
12:128 Quaternary Palynology and Paleobotany 4 s.h.
12:132 Sedimentology 3 s.h.
12:166 Hydrogeology 4 s.h.
12:172 Glacial and Pleistocene Geology 3 s.h.
12:173 Quaternary Environments 3 s.h.
12:179 Engineering Geology 3 s.h.
Lakeside Laboratory courses (most of the laboratory's courses are eligible)

Environmental Management

- 6E:1 Principles of Microeconomics 3-4 s.h.
6E:100 Economics for Business Decision Making 3 s.h.
6E:104 Macroeconomic Theory 3 s.h.
6E:119 Economics of the Government Sector 3 s.h.
6E:133 Environmental and Natural Resource Economics 3 s.h.
6J:47 Introduction to Law 3 s.h.
6J:48 Introduction to Management 3 s.h.

- 30:118 Law and Social Change 3 s.h.
33:153 Hard Cases: Science Policy and Values 3 s.h.
33:155 Risk Technology and the Public 3 s.h.
91:291 International Environmental Law 3 s.h.
102:101 Introduction to Planning and Policy Development 3 s.h.
102:123 Introduction to Environmental Policy and Planning 3 s.h.

Environment and Development

- 30:150 Political Economy Developing Countries 3 s.h.
44:94 International Development 3 s.h.
44:157 Third World Development support 3 s.h.
44:161 African Development 3 s.h.
44:162 Geography of Underdevelopment 3 s.h.
44:163 Geography of the Newly Industrializing Countries 3 s.h.
44:172 Development Planning and Policy 3 s.h.
44:194 Geographic Perspectives on Development 3 s.h.
113:143 Environment and Culture 3 s.h.
113:151 Sociology of the Third World 3 s.h.
113:156 Women's Roles in Cross-Cultural Perspective 3 s.h.

Nature and Society

- 1H:165 Landscape in American Art 3 s.h.
6E:1 Principles of Macroeconomics 3-4 s.h.
6E:104 Macroeconomic Theory 3 s.h.
6E:133 Environmental and Natural Resource Economics 3 s.h.
8:100 Introduction to Criticism and Theory 3 s.h.
26:102 Introduction to Ethics 3 s.h.
26:104 Introduction to Philosophy of Science 3 s.h.
26:132 Introduction to Political Philosophy 3 s.h.
30:133 Postmodern Political Theory 3 s.h.
30:138 Current Political Theory 3 s.h.
33:140 Evolution Evolving 2-4 s.h.
33:153 Hard Cases: Science Policy and Values 3 s.h.
33:155 Risk Technology and the Public 2-4 s.h.
44:194 Geographic Perspectives on Development 3 s.h.
91:291 International Environmental Law 3 s.h.
113:143 Environment and Culture 3 s.h.
131:101 Introduction to Women's Studies 4 s.h.
131:151 Feminist Theory 3 s.h.

Geographic Information Analysis

- 6K:176 Managerial Decision Models 3 s.h.
6K:180 Management Information Systems 3 s.h.
12:110 Introduction to Remote Sensing 4 s.h.
12:154 Advanced Geocomputing 2 s.h.
12:178 Geostatistics Seminar 3 s.h.
22C:16 Introduction to Programming 4 s.h.
22C:17 Programming Techniques and Data Structures 4 s.h.
44:109 Analytical Cartography 3 s.h.
44:113 Principles of Geographic Information Systems 3 s.h.
44:132 Industrial Location 3 s.h.
44:134 Methods of Transportation Analysis 3 s.h.
44:139 Locational Models and Spatial Decision Support Systems 3 s.h.

Four-Year Graduation Plan

The following checkpoints list the minimum requirements students must complete by certain semesters in order to stay on the University's four-year graduation plan. (Courses in the major are those required to complete the major; they may be offered by departments other than the major department.)

URBAN AND REGIONAL STUDIES TRACK

The B.A. degree requires 12 courses in the major, the B.S. requires 13; in these checkpoints the lower number indicates courses for the B.A., and the higher number indicates courses for the B.S.

Before the third semester begins: at least one-quarter of the semester hours required for graduation

Before the fifth semester begins: three to four courses in the major and at least one-half of the semester hours required for graduation

Before the seventh semester begins: six to seven courses in the major and at least three-quarters of the semester hours required for graduation

Before the eighth semester begins: nine to ten courses in the major

During the eighth semester: enrollment in all remaining course work in the major, all remaining General Education courses, and a sufficient number of semester hours to graduate

INTERNATIONAL DEVELOPMENT STUDIES TRACK

The B.A. requires 13 courses in the major, the B.S. requires 14; in these checkpoints the lower number indicates courses for the B.A., and the higher number indicates courses for the B.S.

Before the third semester begins: at least one-quarter of the semester hours required for graduation

Before the fifth semester begins: four to five courses in the major and at least one-half of the semester hours required for graduation

Before the seventh semester begins: seven to eight courses in the major and at least three-quarters of the semester hours required for graduation

Before the eighth semester begins: 10-11 courses in the major

During the eighth semester: enrollment in all remaining course work in the major, all remaining General Education courses, and a sufficient number of semester hours to graduate

ENVIRONMENTAL STUDIES TRACK

The B.A. requires 18 courses in the major, the B.S. requires 19; in these checkpoints the lower number indicates courses for the B.A., and the higher number indicates courses for the B.S.

Before the third semester begins: B.S. – at least one course in the major and one-quarter of the semester hours required for graduation; B.A. – one-quarter of the semester hours required for graduation

Before the fifth semester begins: six to seven courses in the major and at least one-half of the semester hours required for graduation

Before the seventh semester begins: 12-13 courses in the major and at least three-quarters of the semester hours required for graduation

Before the eighth semester begins: 15-16 courses in the major

During the eighth semester: enrollment in all remaining course work in the major, all remaining General Education courses, and a sufficient number of semester hours to graduate

Honors

The honors major is for students of superior ability who want to pursue studies beyond the typical undergraduate level. To graduate with honors in geography, students must be admitted to both the University Honors Program and the honors program in geography by the first semester of the senior year. They must maintain a grade-point average of 3.20 in all University work and a 3.40 in geography. They also must prepare and successfully defend an honors thesis, which consists of original research under the direction of a faculty member. The thesis is assessed by a three-member faculty committee.

Students complete the thesis through a year-long tutorial in 44:198 Honors Tutorial and 44:199 Honors Thesis. The senior course 44:150 Undergraduate Seminar for Geography Majors may be substituted for 44:199 Honors Thesis, provided the student continues work on the thesis under the direction of a faculty member.

Minor

To minor in geography, a student must complete at least 15 semester hours in geography courses with a grade-point average of at least 2.00. Twelve of the 15 semester hours must be taken at The University of Iowa in 100-level courses. Minors are encouraged to select one of the department's three areas of concentration—urban and regional studies, international development studies, or environmental studies—and to take courses listed in that concentration. Minors who wish further assistance in selecting courses may contact the department secretary to request assignment of a minor adviser.

Cooperative Education Program

The Department of Geography is a participant in the University's Cooperative Education Program, which provides opportunities for both undergraduate and graduate students to participate in cooperative training assignments related to their academic programs.

Courses for Nonmajors

Students in the College of Liberal Arts as well as other areas of the University may find geography courses meaningful to their own programs of study. The beginning-level courses 44:1 Introduction to Human Geography, 44:11 Introduction to Social Geography, 44:19 Contemporary Environmental Issues, and 44:30 The Global Economy are approved by the College of Liberal Arts for General Education in

social sciences; 44:157 Third World Development Support is approved for General Education in foreign civilization and culture; 44:161 African Development is approved for General Education in social sciences and foreign civilization and culture; and 44:3 Introduction to Earth Systems Science is approved for General Education in natural sciences. These courses serve as part of a liberal education.

Other courses may be attractive as individual electives. These include 44:15 Introduction to Political Geography, 44:35 World Cities, 44:126 Wetlands: Function, Geography, and Management, 44:128 Drainage Basin: Form and Process, 44:132 Industrial Location, and 44:133 Introduction to Economics of Transportation.

Graduate Programs

The department's graduate programs prepare students to carry on creative and productive research in selected areas of geography involving the use and further elaboration of theory. They also prepare students for positions in research, teaching, or applied geography. Success in achieving these goals has been demonstrated by the strong demand for University of Iowa graduates to fill positions on college and university faculties, in private research organizations, and in business and government. The department provides opportunities for all graduate students to gain practical teaching experience through service as departmental teaching assistants or graduate instructors.

Programs of Study

The faculty in the Department of Geography specialize in three broad areas of geographic inquiry: social-spatial theory, environmental systems, and measurement, modeling, and computation. By choosing appropriately from these three areas, students can develop programs in areas such as economic geography, political geography, biogeography and geomorphology, environment and society, regional development, and GIS and spatial analysis. For the M.A. and Ph.D. degree, students are required to attain and demonstrate competence in a specific area of geography, across the breadth of geography, and in geographical methods.

Competence in a specific area in geography is achieved by appropriate course work chosen in consultation with an adviser and committee. Course work must include at least one seminar for the M.A. and at least two taught by different faculty members for the Ph.D. Work may include courses in cognate fields; students coming to the program with degrees in disciplines other than geography may already have cognate strength. Students achieve competence across the breadth of geography through appropriate course work in areas outside their specific area. This course work consists of at least one course in each of the three areas of departmental specialization (social-spatial theory, environmental systems, and measurement, modeling and computation). Students who come to the program with a degree in geography may have met this requirement already. In addition, students must

enroll in 44:350 Colloquium every semester in residence.

Competence in methods is achieved by appropriate course work in an area related to the student's specialty. This competence must be in an area broader than that needed to complete a research paper or dissertation alone—it must be broad enough to provide a base for understanding the literature in the area now and in the future.

The B.A. or B.S. degree in geography is not a prerequisite for entry into the program, but students are expected to have an undergraduate background relevant to pursuing graduate work in geography. A strong background in any of the social or environmental sciences and an interest in exploring the regional and spatial perspectives characterizing modern geography are more important than the particular disciplinary orientation of the student's baccalaureate degree. Depending on the strength and suitability of their prior training, however, students may be required to take courses that are prerequisites for courses in their elected areas. Credit received for such courses cannot be applied to the requirements for a degree.

Master of Arts

The M.A. is designed to be completed in four semesters. It requires a minimum of 30 semester hours of graduate work, of which 15 semester hours must be earned in courses numbered 200 and above. However, most students typically accumulate 40 to 48 semester hours of graduate credit in completing the M.A. Students are advised to use these additional hours to increase their breadth of knowledge in geography and to tailor their programs of study to their individual interests. A maximum of 6 semester hours may be earned for thesis work.

Competence in a specific area of geography, across the breadth of geography, and in geographical methods is demonstrated by completion of appropriate course work and either a research paper or an M.A. thesis. The M.A. is awarded upon completion of the research paper and an M.A. exam, completion and defense of an M.A. thesis, or completion of the comprehensive exams for the Ph.D.

Doctor of Philosophy

The Doctor of Philosophy program is designed to prepare students for positions in college and university teaching and in advanced research. It provides programs of study leading to broad knowledge of a field of geography and its literature and special expertise in a specific subfield. The former usually represents the general area in which the Ph.D. holder seeks employment, whereas the latter represents his or her area of most active research involvement.

The Ph.D. is a four- to five-year postbaccalaureate program. Students can enter the program directly from the B.A. or B.S. or with advanced standing corresponding to their previous graduate education. Students must fulfill all departmental requirements for the M.A. except for the M.A. examination. In addition, competence in a specific area of geography, across the breadth of geography, and in geographical methods is demonstrated by the

completion of an original research paper, the writing of an area review paper, passing comprehensive examinations, and completion and defense of a dissertation.

Before students can be admitted formally to candidacy for the Ph. D., they must submit an original research paper to the faculty for its approval. Students who complete the M.A. with thesis can submit the M.A. thesis to fulfill this requirement. Students entering the program with an M.A. from another institution can submit theses or research papers completed elsewhere to fulfill the requirement. Prior to taking the comprehensive examination, which consists of both written and oral components, the student must submit an "area review paper" to his or her Ph.D. committee. This paper, which must be approved by the student's Ph.D. adviser, consists of a critical review of research in the student's area of concentration. As such, it is a culminating step in a student's program of study as well as a statement of future research directions. The comprehensive examination covers both the student's area of concentration and his or her more general field in the discipline. After obtaining the approval of a dissertation supervisor, the student must submit a dissertation proposal to his or her dissertation committee for its critical comments and approval. The student then must complete and defend the dissertation.

Admission

The department adheres to the general rules and regulations set forth in the **Manual of Rules and Regulations of the Graduate College**, and evaluates the applicant's undergraduate grade-point average, especially of his or her junior and senior years; scores on the Graduate Record Examination (GRE) General Test; three letters of recommendation; and an essay in which the applicant sets forth the reasons for wanting to study geography at The University of Iowa.

Financial Aid

A number of graduate appointments as teaching or research assistants are available. In addition, a number of fellowships are available for outstanding applicants and underrepresented minorities. Awards are based on merit. In making awards the department pays particular attention to grade-point average, GRE score, letters of recommendation, and how well the student's objectives fit with departmental specializations. Applications for graduate appointments must be received by February 1. Applicants for fellowships should complete their applications by January 15.

Facilities

The department houses a geographic information systems and spatial analysis laboratory equipped with a variety of workstations, digitizers, and plotters. These UNIX, DOS, and Macintosh workstations support a variety of GIS software packages, including ARC/INFO, MGE, IDRISI, Atlas/GIS, MAPINFO, Transcad, and GIS Plus. The department also participates in an advanced GIS facility in the Center for Global and Regional

Environmental Research. Departmental computers are linked to the University's communication network, which provides access to the World Wide Web and external computing resources.

The department recently began operating a state-of-the-art Geographic Information Systems (GIS) instructional laboratory equipped with 20 networked student workstations, instructional support technology, and a suite of peripherals.

Students also have access to a University computing cluster that contains IBM PCs, Macintosh computers, terminals, several printers, and a plotter. It is located on the same floor as the department offices.

For studies in water resources and physical geography, the department has laboratories for analysis of vegetation, sediment, soil, and water quality; a field station in California; a geomorphic computing laboratory that houses dedicated workstations and a parallel computing system for watershed and geomorphic modeling; an environmental instrumentation laboratory for design and preparation of field instruction systems; and a variety of field equipment, ranging from data loggers to electromagnetic flow meters.

The map collection in the University's Main Library contains more than 115,500 maps, a total of 3,600 atlases and reference works, and about 100,000 aerial photographs, primarily of Iowa. The library is a depository for maps of the U.S. Army Topographic Command (formerly the Army Map Service).

The Geology Library contains approximately 70,000 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 aerial photographs for use by students in laboratory exercises.

Courses

Primarily for Undergraduates

- 44:000 Cooperative Education Training Assignment 0 s.h.
- 44:1 Introduction to Human Geography 4 s.h.
Application of geographic principles to contemporary social, economic, and political problems; urban growth; problems of the ghetto; diffusion of innovations; territoriality and perception. GE: social sciences.
- 44:3 Introduction to Earth Systems Science 4 s.h.
Elementary principles of physical geography: physics of weather and climate, hydrological systems, geomorphological and geological forces, pedological processes, and ecological processes and patterns; geographic explanation of physical environment, with principles applied to the human use system; environmental pollution and natural hazards. GE: natural sciences.
- 44:11 Introduction to Social Geography 3 s.h.
Spatial considerations of population growth and distribution; minorities within a population; poverty; housing social organization and disorganization; social systems including education, religion, recreation, medical, social sciences; diffusion of ideas and traits over space. GE: social sciences.
- 44:15 Introduction to Political Geography 3 s.h.
Emphasis on application of geographical and economic theory in understanding historical development and restructuring of political economies at global, national, and local levels; development of nation states, nationalism, imperialism, geopolitics, economic restructuring, electoral geography.

- 44:19 Contemporary Environmental Issues 3 s.h.
Political, economic, cultural, technologic, ecological, and ethical issues associated with natural resource and environmental problems, including population, global climate change, food production, tropical deforestation, soil erosion, waste management. GE: social sciences.
- 44:30 The Global Economy 3 s.h.
Location and spatial organization of the world's major types of economies; agriculture, energy and minerals, manufacturing, transportation; trade and service centers. GE: social sciences.
- 44:35 World Cities 3 s.h.
Urbanization as a process; specific concepts and theories of urbanization through global patterns, regional urban systems, individual metropolitan areas. Offered spring semesters.
- 44:75 Introduction to Cartography 2 s.h.
Cartography and map analysis; history of cartography, map projections and scale, symbolization, data collection and cartometry, computer mapping, remote sensing, geographic information systems.
- 44:85 Introduction to Economic and Social statistics 3 s.h.
Statistical methods applied to problems in economics, other social sciences; graphical methods, descriptive statistics, sampling and inference, regression analysis, simple forecasting methods. Same as 6E:50.
- 44:94 International Development 3 s.h.
Theories of international development, political economy, development policy and planning, empirical analysis of conditions, policies, experiences of selected Third World countries. Prerequisite: 44:1.
- 44:100 Readings for Undergraduates arr.
Supervised readings in geography. Consent of instructor required.

For Undergraduates and Graduates

- 44:101 Climatology 3 s.h.
Boundary layer processes that drive atmospheric dynamics; exchanges of energy and water at simple and complex surfaces; global climate change records, theories, models; impacts of climate on society. Prerequisite: 44:3 or consent of instructor.
- 44:102 Earth Surface Processes 3 s.h.
Basic geomorphic and environmental processes that shape the surface of the earth; emphasis on processes of weathering: mass movement such as creep, landslides, earth flow; erosion, transport, deposition by fluid agents such as wind, water, ice; methods used to study these physical processes. Prerequisite: 44:3 or a course in geology. Same as 12:102.
- 44:103 Biogeography 2-3 s.h.
Distribution and abundance of plants and animals, spatial patterns and processes, and temporal dynamics of succession, response to climate change, and evolution; methods applied to the study of vegetation and plant community patterns. Prerequisite: 44:3 or 2:1 or consent of instructor. Same as 2:103.
- 44:104 Environment and Development 3 s.h.
Environmental impacts of industrial and rural development explored through Third World [Latin America, Africa, South and East Asia] case studies; environmental degradation from perspective of political economy and ecology; class, gender, and indigenous peoples' issues; industry-agriculture linkages.
- 44:108 Introduction to Geographical Computing 3 s.h.
Computer use for spatial problem solving; representation of geographical data, sampling and spatial statistics, overview of GIS and its use in human and physical geography. Prerequisites: 44:75 and 44:85.
- 44:109 Analytical Cartography 3 s.h.
Design and implementation of computer algorithms for processing digital geographical data; map projections and conversion, affine transformations, data capture programs, cartographic data structures, generalization, fractals, interpolation. Prerequisite: 44:75.
- 44:113 Principles of Geographic Information Systems 3 s.h.
Issues in establishment of geographic information systems: spatial data encoding, raster-vector options, spatial and attribute resolution, cartographic data models, linkages to spatial analysis procedures, display techniques for decision support, institutional setting. Prerequisite: 44:75.

- 44:121 Natural Resources Policy 3 s.h.
Geographic, cultural, political, economic, and ethical dimensions of natural resources policy; substantive and theoretical insights from the natural sciences, social sciences, and humanities as parts of a conceptual framework for analyzing current resource problems from a geographic perspective; U.S. natural resource problems and policy questions.
- 44:122 Environmental Conservation in the United States 3 s.h.
Varied natural environments of the United States; problems arising from conflicting land uses; consideration of public land use policy, environmental impacts of different land uses, problems of habitat preservation and endangered species. Prerequisite: 44:3 or 44:19 or consent of instructor.
- 44:123 Landscape Ecology 3 s.h.
Effects of spatial pattern on spatial processes in ecology; characteristics of matrix, patch, corridor; fragmentation, deforestation, habitat loss; spatial flows of energy, matter, genetic information; relationship to human impact, global climate change. Prerequisites: 44:103 or a 100-level course in ecology, and 44:85.
- 44:124 Gender and the Environment 3 s.h.
Relationships between gendered human activities and environmental problems in developed and less developed regional contexts; role of women's activism in environmental movements; ecofeminist perspectives. Prerequisite: 44:19 or 44:121 or an introductory women's studies course. same as 131:124.
- 44:125 Environmental Impact Analysis 4 s.h.
Environmental impact assessment methodologies; emphasis on cost-benefit risk, cost-effectiveness and incremental analysis, and overlay and graphic techniques; optimal resource use, system simulation; field trips to local environmental control facilities. Prerequisites: 44:19, and 29:5 or equivalent.
- 44:126 Wetlands: Function, Geography, and Management 3 s.h.
Biotic aspects of water resources production; geographical basis of biophysical processes in drainage basins; spatial aspects of stream ecology; regional characterization of wetland structure and process. Prerequisite: 2:111 or 44:101 or 44:102 or 44:103.
- 44:127 Environmental Quality: Science, Technology, and policy 3 s.h.
Geographical perspectives in the study and interpretation of chemicals in the environment; environmental standards under existing laws; local, regional, national, international case studies in environment and health; socioeconomic and institutional considerations in designing environmental protection strategies. Prerequisite: 44:85 or equivalent or consent of instructor.
- 44:128 Drainage Basin: Form and Process 3 s.h.
Hydrological principles, stream channel processes, and fluvial geomorphology within the drainage basin system: spatial and temporal variations in water distribution, analyses of hydrological data, flow mechanisms, sediment transport, forecasting procedures, hydrography construction and modeling. Prerequisites: 44:85, and 44:102 or a 100-level geology or hydraulics course. same as 53:128.
- 44:129 Water Resources Management 3 s.h.
Application of hydrological information in water resources management; aspects of water quantity and quality, groundwater availability, water use and treatment, resource development, political and administrative issues; basin management problems- forestry, agriculture, urbanization, floods, droughts. Prerequisite: 44:102 or 44:128 or equivalent, and 44:121 or 44:122 or equivalent
- 44:131 Medical Geography 3 s.h.
Provision of health care in selected countries, with particular reference to the Third World; focus on problems of geographical, economic, cultural accessibility to health services; disease ecology, prospective payment systems, privatization, medical pluralism.
- 44:132 Industrial Location 3 s.h.
Theory and analysis of manufacturing location, classical location theory, behavioral analysis of location decision-making, analysis of structural economic change, industrial restructuring processes, regional impact of industrial change, regional industrial development policies, environmental impact of industrial production.
- 44:133 Introduction to Economics of Transportation 1-3 s.h.
Overview of transportation markets (intercity, rural, urban) and transportation modes (railroads, highways, air carriage, waterways); regulation, finance, physical distribution issues. Same as 6E:145, 102:133.
- 44:134 Methods of Transportation Analysis 3 s.h.
Conceptual basis for predicting effects of transportation policy measures on traffic flows and system performance; transportation measurements; introduction to travel demand modeling; introduction to system performance modeling, network analysis, equilibration. Prerequisites: 44:85 and a previous transportation course, or graduate standing. same as 102:134.
- 44:135 Urban Geography 3 s.h.
Central ideas of modern urban geography, their links to social theory; focus on interrelation between social change, urban environment; evolution of urban systems, emergence of the capitalist city, urban social and residential differentiation, local politics of uneven development Prerequisite: 44:1 or 44:15.
- 44:136 Transportation and the Environment 3 s.h.
Environmental impact of alternative modes of transportation; history of U.S. environmental legislation on transportation; methods of environmental impact analysis; costs, benefits of implementing policies, procedures designed to protect environment.
- 44:137 Economic Theory of Location 3 s.h.
Behaviorally-based location theories for social and economic activities traced from their classical origins to Use contemporary literature where both descriptive (e.g., central place theory) and prescriptive (e.g., location-allocation) models of multiple location decisions exist; relationship between location-allocation models and competitive location theory. Prerequisites: 6E:1 or graduate standing, and 44:30 or 44:132; or consent of instructor.
- 44:139 Locational Models and Spatial Decision Support Systems 3 s.h.
Application of location models within GIS environments to support decision making; small area demographic forecasting location-allocation models, regionalization problems, shortest path models, other spatial analysis methods used to support spatial decisions. Prerequisite: 44:108 or 44:113.
- 44:143 Urban Transportation 3 s.h.
Policies, institutions for planning managing urban transport; production, pricing, distribution of transit and highway services; city case studies, urban freight issues. Prerequisites: 6E:1 and 6E:2, or 44:133 or 44:134 or 102:101. Same as 102:143.
- 44:150 Undergraduate Seminar for Geography Majors 3 s.h.
Participation in a term project and preparation of a documented report. Offered spring semesters. Open only to seniors. Prerequisites: 44:75, 44:85, and 44:108.
- 44:151 Senior Thesis 3 s.h.
Original research. Open only to seniors. Consent of instructor required.
- 44:157 Third World Development Support 3 s.h.
Critical analysis of theories, policies, programs, practices of Third World development; nature of the social scientific support needed to understand and accelerate the process; analysis of historical trends in the administration of organized development aid since its inception in 1945. GE: foreign civilization and culture. Same as 19:157.
- 44:161 African Development 3 s.h.
problems of economic, political, spatial integration in Africa; patterns and processes of economic development and nation building. GE: foreign civilization and culture or social sciences. Prerequisite: 44:94. Same as 30:146, 141:146.
- 44:162 Geography of Underdevelopment 3 s.h.
Spatial implications of the economic, social, and political institutions affecting contemporary Third World countries; political economy of development and underdevelopment studied through reading major theoretical works and analyzing case studies Prerequisite: 44:94 or graduate standing.
- 44:163 Geography of the Newly Industrializing Countries 3 s.h.
Newly Industrializing countries (NICs) in geographic and historical perspectives; U.S. manufacturing base as a backdrop in NICs industrialization; off-shore industrial production, women in development, import-substitution industrialization (ISI), export-led industrialization, theories of industrial location, high-technology industries, the international division of labor; regional profiles taken from the Pacific Rim, Chile, Brazil, and the northern Mexican maquila industry. Prerequisites: 44:85 and 44:94.
- 44:166 Contemporary Europe: Interaction and Change 3 s.h.
Contemporary Europe, with focus on societies' problems, attempts to resolve them; interactions within and among European countries, between Europe and the rest of the world. Prerequisites: 44:15 or 44:30, and 44:135.
- 44:170 Geography and Public Policy 3 s.h.
Analysis of public policy, including political struggle over the action of the state, actual adoption of policies, and policy consequences; analysis for public policy, including alternative goals, policy planning, and policy implementation. American and foreign content. Prerequisite: 44:1.
- 44:172 Regions and Regionalism in North American Society 3 s.h.
Historical and contemporary perspectives on place, regions, regionalism in North American society. Prerequisites: 44:15 or 44:135 or senior standing or consent of instructor.
- 44:172 Development Planning and Policy 3 s.h.
Explicit and implicit strategies for economic and social development: origins, goals, formulation, execution, results; policy analysis methods. Prerequisites: 44:85 and 44:94.
- 44:176 Social Consequences of Global Change 3 s.h.
Social consequences of economic, political transformation; urbanization, technological change, and penetration of global capital, their impacts on gender relations, ethnic identity and significance, other social structures..
- 44:180 Reid Methods: Physical and Environmental Processes arr.
Problem definition and research design in a field setting; sampling theory and procedures, collection of primary data using different sensor and recording methods, data analyses and interpretation of physical and environmental processes in geomorphic, climatic, biogeographic, and environmental research. Prerequisite: 12 semester hours of courses in geography or consent of instructor. Same as 53:180.
- 44:194 Geographic Perspectives on Development 3 s.h.
Theoretical and empirical studies of the regional development process, with emphasis on developing countries; alternative regional development theories and changes in development theories in the literature of geography, related disciplines. Prerequisite: prior or concurrent satisfaction of all other international development track requirements.
- 44:197 Special Topics arr.
Contemporary fields of enquiry, such as political economy, regional/African development, biophysical systems, GIS, locational analysis, water resources, economic geography, demographic analysis, environment, urbanization, transportation. May be repeated.
- 44:198 Honors Tutorial arr.
Individual study. May be repeated.
- 44:199 Honors Thesis arr.
Original research. Open only to honors students.

For Graduates

- 44:200 Readings arr.
Supervised readings by graduate students in topics of their choice. Consent of instructor required.
- 44:210 philosophy and Epistemology in Geography 3 s.h.
Analysis of philosophies and methodologies of modern geography, with emphasis on epistemological and ontological issues; discussion of positivism (empiricism), its variants, and its alternatives in light of past and current research.
- 44:216 Behavioral Analysis in Geography 3 s.h.
Relationship between human behavior and the social and physical environment; environmental perception, mental maps, spatial cognition, spatial choice models; preference structures, utility theory, decision making by individuals or groups in relation to the geographical organization of activities.
- 44:221 Nature-Society Theory 3 s.h.
Theoretical bases for understanding the relationship between human society and the natural environment; social construction of nature — ecological models, ecomarxism, culture theory, ecofeminism, poststructural/postmodernist theories, political ecology, environmental history. Prerequisite: 44:121 or consent of instructor.
- 44:222 Environmental Social Movements 3 s.h.
Processes of mobilization and resolution in environmental conflicts, from perspectives of public choice, liberal and radical theory; relationships to new social movements; applications to environmental movements in First and Third Worlds.
- 44:225 Environmental/Social Systems Analysis 3 s.h.
Linear optimization and related models; recent applications in water resources management, pollution control, economics, public policy; potential future applications in designing water quality monitoring networks. Consent of instructor required.
- 44:226 Advanced Biogeography 3 s.h.
Current questions on spatial distribution of organisms, spatial patterns of biodiversity, environmental gradients.

- 44:227 Environmental Quality Science, Technology, and Policy 3 s.h.
Geographical perspectives in the study and interpretation of chemicals in the environment; environmental standards under existing laws; local, regional, national, international case studies in environment and health; socioeconomic and institutional considerations in designing environmental protection strategies.
- 44:228 Advanced Earth Surface Processes 3 s.h.
Theoretical concepts and empirical studies of hydrologic, climatic, geomorphic processes as related to the earth's surface: measurement, analysis, modeling; drainage basin analysis and modeling; responses to climatic and environmental change. Prerequisite: strong background in physical geography or consent of instructor. Same as 12:228.
- 44:229 Water Resources Management 2-3 s.h.
Theoretical concepts, empirical studies of hydrologic, geomorphic principles and processes within drainage basin systems; spatial and temporal variation; integration of water distribution processes, hydrologic data, flow and sediment transport mechanisms, modeling. Consent of instructor required. Prerequisite: 44:128 or equivalent.
- 44:230 Advanced Drainage Basin Analysis 3 s.h.
Theoretical concepts, empirical studies of hydrologic, geomorphic principles and processes within drainage basin systems; spatial and temporal variation; integration of water distribution processes, hydrologic data, flow and sediment transport mechanisms, modeling. Consent of instructor required. Prerequisite: 44:128 or equivalent.
- 44:232 Advanced Industrial Geography 3 s.h.
The new industrial geography, economic growth processes, industrial organization, theory of the firm; current research.
- 44:236 Travel Demand Modeling 3 s.h.
Same as 6E:226.
- 44:246 Advanced Landscape Ecology 3 s.h.
Current questions of effects of spatial structure on ecological processes; ecotones and boundaries, metapopulations, pattern metrics.
- 44:262 Political Economy of Regional Development 3 s.h.
The "unequal" relationship between Third World countries and the industrial world; contemporary development problems of Third World societies; form and function of the Third World/industrial world relationship, in both external and internal dimensions. Consent of instructor required.
- 44:265 Transportation Regulation and Finance 3 s.h.
Public policy options for improving passenger and commodity movements within and between cities; air, water, land-based transportation modes. same as 102:265.
- 44:270 Geography and Public Policy 3 s.h.
In-depth examination of literatures dealing with geographical aspects of jurisdictional organization, provision of public services, location of public facilities, geography of elections, public policy.
- 44:272 Community Conflict, Space, and Politics 3 s.h.
Issues of structure and agency; the state and local state and community organization; the politics of place in studying community conflict and urban social change in western democracies.
- 44:273 Social Theory and Human Geography 3 s.h.
Assumption that space is a socially produced and reproduced commodity that gains value as it enters the production process; how space enters production vis-a-vis forces that circumscribe larger societal relationships; production and reproduction of social space in a capitalist economy.
- 44:274 Seminar: Social Change arr.
Social consequences of economic and political transformations; impacts of rural-urban migration; gender and ethnicity as the products and consequences of systems transformation. Same as 7D:300, 34:274, 42:274.
- 44:275 Development Policy and Planning in the Third World 3 s.h.
Development policies and planning in Third World countries; important development problems and alternative perspectives on problems and proposed solutions; interdisciplinary seminar. Same as 7F:275, 34:275, 42:275, 102:275, 113:275.
- 44:276 Special Topics in Political Geography 3 s.h.
Current topics in political geography or geopolitics; intensive readings.
- 44:280 Advanced Field Methods: Environmental 2-4 s.h.
Problem definition and research design in a field setting; sampling theory and procedures, collection of primary data using different sensor and recording methods, data analyses and interpretation of physical and environmental processes in geomorphic, climatic, biogeographic, and environmental research. Prerequisite: 12 semester hours of courses in geography or consent of instructor.
- 44:285 Methods of Regional Analysis: Regional Science 3 s.h.
Problem definition and research design in a selected area of geographic research conducted in a field setting; sampling procedures, collection of primary data, data analyzes and interpretation; techniques and methodologies specific to the selected area. Consent of instructor required.
- 44:293 Advanced Location Theory 3 s.h.
Economics of location; location of the firm; transportation cost and location; location-allocation models; spatial price theory. Consent of instructor required. Prerequisite: 6E:203.
- 44:296 Topics in Geographic Information Science 3 s.h.
Current theoretical research issues in geographic information science; intensive readings. Prerequisite: 44:113 or consent of instructor.
- 44:297 Special Topics arr.
Contemporary fields of enquiry, such as political economy, regional/African development, biophysical systems, CIS, locational analysis, water resources, economic geography, demographic analysis, environment, urbanization, transportation.
- 44:308 Research Seminar: Quantitative Methods, Computer Methods, and Modeling 2-3 s.h.
- 44:315 Research Seminar: Political Geography arr.
- 44:327 Research Seminar: Environment and Society Str.
- 44:328 Research Seminar: Physical Geography arr.
- 44:329 Research Seminar: Water Resources arr.
- 44:330 Research Seminar: Location Theory arr.
Critique of the contemporary location theory literature; discussion of solutions to the problems identified. Prerequisite: 44:137.
- 44:337 Seminar: Urbanization arr.
Social consequences of economic, political transformations; focus on impacts of rural-urban migration; gender and ethnicity as products, consequences of systems transformation. May be repeated. Same as 7D:301, 34:279.
- 44:350 Geography Colloquium arr.
- 44:394 Research Seminar: Regional Development 3 s.h.
- 44:415 Research: Political Geography arr.
Graduate-level research for Ph.D. students, generally post-comprehensive.
- 44:440 Research Environmental systems Analysis arr.
- 44:441 Research: Locational Analysis arr.
- 44:445 Research in Political Geography/Economy arr.
Graduate-level research for Ph.D. students, generally post-comprehensive.
- 44:450 Thesis arr.

GEOLOGY

Chair: Philip H. Heckel
Professors: Richard G. Baker, Ann F. Budd, Robert S. Carmichael, Lon D. Drake, Brian F. Glenister, Philip H. Heckel, Gilbert Klapper, George R. McCormick, Holmes A. Semken
Professors emeriti: William M. Furnish, Richard A. Hoppin, Sherwood D. Tuttle
Adjunct professors: G. Brian Bailey, George R. Hallberg, Darrel B. Hoff, Donald L. Koch
Associate professors: Robert L. Brenner, C. Thomas Foster Jr., Luis A. Gonzalez, Mark K. Reagan, Frank H. Weirich
Adjunct associate professors: E. Arthur Bettis, Gregory A. Ludvigson, Carol A. Thompson, Brian J. Witzke

Assistant professors: James E. Faulds, You-Kuan Zhang
Adjunct assistant professors: Ray Anderson, Michael Burkart, A. Umran Dogan, R. Sanders Rhodes II
Adjunct instructor: Julia Golden
Undergraduate degrees: B.A., B.S. in Geology; minor in Geology
Graduate degrees: M.S., Ph.D. in Geology

Geology is the basic study and practical application of scientific disciplines related to understanding the earth. Geological concerns include the earth's origin, its present appearance and character internally and at the surface, its alteration with time, location of economic and energy resources, and how mankind is changing the earth for future generations. The Department of Geology has several subfields – mineralogy, petrology, stratigraphy, structural geology, paleontology, paleoecology, sedimentology, economic geology, geomorphology, glacial geology, environmental geology—as well as applied geophysics, geochemistry, paleobiology, hydrogeology, engineering geology, and remote sensing.

Career opportunities are available to professional geologists in industry (especially related to environmental concerns), education, urban planning, state and federal geological surveys, and government resource 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.

Many of The University of Iowa's geology graduates find employment with resource companies, environmental corporations, and educational institutions. Others continue in graduate school or take jobs with government or conservation agencies. Some intend to enter law, business, or fields such as urban planning, environmental studies, engineering, archaeology, science education, or oceanography as advanced areas. Geology is good preparation for all of these.

Each year more than 700 students enroll in 12:3 Earth History and Resources and 12:8 Introduction to Environmental Geology, laboratory-lecture courses approved by the College of Liberal Arts for General Education in natural sciences.

For nonmajors, the department offers a lecture sequence featuring a general survey of geology and several advanced courses with few prerequisites –paleontology, geology of Iowa, remote sensing, geomorphology, and oceanography.

Undergraduate Programs

Geology majors receive at least an academic year's work in three allied scientific areas—physics, chemistry, and mathematics— and a semester of biological sciences in addition to a course in each major area of geology.

Students majoring in geology must meet the General Education Program requirements of the College of Liberal Arts. It is recommended that they satisfy the foreign language requirement with French, German, or Russian, and the social