

# GEOGRAPHY, GEOLOGY, AND THE ENVIRONMENT (GEO) 440

206 Felmley Hall, (309) 438-7649  
Website: [Geo.IllinoisState.edu](http://Geo.IllinoisState.edu)

**Chairperson:** Dagmar Budikova.

## Tenured/Tenure-track Faculty:

*University Professor:* Malone.

*Professors:* Budikova, Day, Peterson.

*Associate Professors:* Himley, Kostelnick, O'Reilly, Rowley, Thayn.

*Assistant Professors:* Banik, Orzeck, Seyoum, Tranel, Zintambila.

## General Department Information

### HONORS IN GEOGRAPHY-GEOLOGY

The Department of Geography, Geology, and the Environment invites qualified Geography and Geology majors to distinguish themselves by earning Honors through approved coursework and independent study. Students who enroll in the Honors program will have the opportunity to work closely with selected faculty. Those students who complete the requirements will graduate with Departmental Honors, which will be indicated on their transcript and diploma. Further details about the University Honors program are available at [Honors.IllinoisState.edu](http://Honors.IllinoisState.edu).

### Admissions Requirements:

Students majoring in the Geography, Geology, and the Environment Department may be admitted to the Departmental Honors Program if they have (1) completed at least 45 hours of college-level courses, (2) a cumulative GPA of 3.30 and at least 3.50 in the major, and (3) are a member of the University Honors Program.

### Honors Study Requirements:

In order to graduate with honors in the Geography, Geology, and the Environment Department, a student must complete (1) all university graduation requirements, (2) all regular requirements for the major, (3) at least 12 hours of Honors work in the major, including at least 3 hours of Honors Independent Study (GEO 299) with the other 9 hours distributed among in-course honors in Geography for Geography majors or Geology for Geology majors, (4) maintain a cumulative GPA of at least 3.30 and at least 3.50 in the major, and (5) apply to the Honors Office during the first month of the graduation semester for Honors Degree designation.

### Geography Programs

Degrees Offered: B.A., B.S.

### MAJOR IN GEOGRAPHY

**Advisor:** Jill Freund Thomas (309) 438-8403.  
Email: [jfthoma@ilstu.edu](mailto:jfthoma@ilstu.edu)

Programs must be planned in consultation with the program advisor.

- Minimum of 50 hours required. All Geography majors should consult with the program advisor concerning appropriate elective coursework in related fields. The faculty also recommends that students consider participating in a Study Abroad program as a means of experiencing different cultural settings.
- Required courses (29 hours): GEO 100; 135 or 142; 138, 204, 205, 238, 292, 300, 303, 398 (4 hours).
- Elective Geography-Geology courses: a minimum of 21 hours required. 15 hours must be at the 300 level. 1 course (3 hours) must be a regional class (see below).  
Geography regional course options: GEO 235A01, 235A02, 235A04, 265, 306A15, 306A22, 306A26.  
Other elective Geography course options: GEO 235A01, 235A02, 235A04, 265 (if not already taken), 304, 305, 306A15, 306A22, 306A26 (if not already taken); 308, 310, 311, 315, 334, 336, 341, 342, 344, 351, 370.  
Geology elective course options: GEO 361, 380, 382.
- Students must earn a grade of C or better in all required courses to be eligible to participate in GEO 398.

### Geography Teacher Education Sequence:

**Advisor:** Jill Freund Thomas (309) 438-8403  
Email: [jfthoma@ilstu.edu](mailto:jfthoma@ilstu.edu)

- Minimum of 56 hours required. Part of entitlement program leading to teacher licensure with a secondary 6-12 endorsement. Student must plan program in consultation with an advisor.
- Required Geography courses (34 hours): GEO 100, 135, 138, 142, 204, 205, 261, 292, 300, 303, 307; 1 regional Geography course (3 hours) from GEO 235A01, 235A02, 235A04, 265, 306A15, 306A22, 306A26.
- Advanced Geography social science elective courses: 6 hours at the 300 level from GEO 304, 305, 306A15, 306A22, 306A26, 308, 310, 315, 334, 336, 341, 342, 344, 351, 370.
- Supporting courses required (16 hours): ECO 105; HIS 101 or 102, 135 or 136; POL 101 or 106; SOC 106.
- To qualify for the professional educator license, the student must complete the Professional Education requirements (26 hours): EAF 228 or 231 or 235; PSY 215; TCH 212, 216, 219; STT 399A18 Student Teaching (12 hours); and the General Education requirements as described in this *Undergraduate Catalog*.
- **NOTE:** A 2.75 GPA in the major and overall is required for admission to Student Teaching. Deadlines for admission to Professional Studies and Student Teaching are available from the Cecilia J. Lauby Teacher Education Center.

### CLINICAL EXPERIENCES IN TEACHER EDUCATION

A variety of clinical (pre-student teaching) experiences, as well as student teaching, are included in the teacher candidates professional preparation. Observations, small and large group instruction, tutoring, field experiences, and student teaching are included in the Clinical Experiences Program. The experi-

ences offered prior to student teaching are integral parts of specific college courses. Clinical experiences are provided in off-campus professional development schools, local schools, campus laboratory schools, agencies, and other approved non-school settings. The Cecilia J. Lauby Teacher Education Center monitors and documents all clinical experiences. Teacher candidates will show verification of having completed clinical experiences commensurate with attaining local, state, and national standards. Teacher candidates must provide their own transportation to clinical experiences sites.

Candidates are required to provide documentation of meeting all State of Illinois, district, and university requirements in regard to criminal background checks BEFORE beginning any clinical experiences. Criminal background checks must remain current as of the last day of the clinical experience. Candidates should consult with clinical course faculty and the Cecilia J. Lauby Teacher Education Center well in advance of clinical experiences to determine specific requirements needed each semester.

The approximate number of clinical hours associated with each course offering can be found with the appropriate course description in this Undergraduate Catalog. The following legend relates to the kind of activity related to a specific course.

**Clinical Experiences Legend**

- Observation (including field trips)
- Tutoring one-on-one contact
- Non-instructional assisting
- Small group instruction
- Whole class instruction
- Work with clinic client(s)
- Graduate practicum
- Professional meeting

**MINOR IN GEOGRAPHY**

- 21 hours in Geography required.
- Required courses: GEO 100; GEO 135 or 142.

**MINOR IN ENVIRONMENTAL STUDIES**

The Minor in Environmental Studies is a multidisciplinary program that is available to students in any undergraduate major. The mission of the Environmental Studies Minor Program is to increase awareness of the interrelationships that exist between humans and the natural environment. Students will broaden their understanding of environmental issues as well as connections between human-made and natural environments. Knowledge and skills acquired through the program will help prepare students for further academic studies or for an environment-related career. Students should plan their minor program with the assistance of the Environmental Studies advisor.

- Minimum of 25 hours required.
- Required courses: GEO 100 and 205.
- Choose 3 courses from: AGR 157, 203, 234; BSC 196, 201 or 202, 212, 222, 223, 337, 375, 376, 378, 379; CHE 280; GEO 207, 211, 276, 341, 344, 361, 380; HSC 257; PHY 207.
- Choose 3 courses from: ECO 255; ENG 249; GEO 303,

334; HIS 240; HSC 156; PHI 236, 250; POL 232, 236, 254; SOC 330, 362.

- Students may choose to pursue one environmentally-based independent study or one environmentally-based internship to fulfill up to 3 credits toward the minor. Prior approval of the Advisor of the Minor in Environmental Studies is required for the student to receive credit for this experience toward fulfilling the requirements for the minor. Arrangement for supervision of the internship experience must be handled through the student’s major department.

**NOTE:** No more than 9 hours may be selected from the student’s major department.

**Geology Programs**

Degrees Offered: B.S.

**MAJOR IN GEOLOGY**

**Advisor:** Dr. Dave Malone, (309) 438-2692.

Email: dhmalon@ilstu.edu

**Traditional Sequence:**

- 40 hours in Geology required.
- Required courses: GEO 202, 203, 280, 285, 290, 295, 296, 395 and one of the following applied quantitative courses: GEO 303 or 363, 360, 361, 362, or 364.
- Required interdisciplinary courses: CHE 140 or equivalent, and CHE 141; MAT 145 and 146; PHY 108 and 109 (or 110 and 111).
- Students must complete all core courses with a grade of C or better to be able to enroll in GEO 395.

**Earth and Space Science Teacher Education Sequence:**

**Advisors:** Dr. Lisa Tranel (for content requirements),

Email: ltranel@ilstu.edu and Jill Thomas (for professional teaching requirements), Email: jfthoma@ilstu.edu.

- 83 total hours required.
- 57 hours in Geology, Geography, Physics, Chemistry, and Biological Sciences required.
- Required courses (23 hours): GEO 202, 203, 211, 280, 290, 295 and 307.
- Any 6 credit hours selected from advanced GEO science courses (at the 200-level or above).
- Required interdisciplinary courses (28 hours): BSC 196, 197; CHE 110; PHY 108, 109, 208, and 311.
- To qualify for the professional educator license, the student must complete the Professional Education requirements (26 hours): EAF 228 or 231 or 235; PSY 215; TCH 212, 216, 219; STT 399A17 (12 hours) Student Teaching.
- **NOTE:** A 2.50 GPA in the major and overall is required for admission to Professional Studies and a 2.75 GPA for admission to Student Teaching. Deadlines for admission to Professional Studies and Student Teaching are available from the Cecilia J. Lauby Center for Teacher Education.

## MINOR IN GEOLOGY

- 22 hours in Geology required.
- Required courses: GEO 102, 202 and 203.

## Geography Courses

**100 INTRODUCTION TO ENVIRONMENTAL SYSTEMS**  
**4 sem. hrs.**

Introduction to geographic perspectives on Earth's dynamic systems, with emphasis on the interaction between these systems and human activities. Weather, climate, water, rocks, landforms, soils, and ecosystems are discussed. Lecture and lab. Formerly *EARTH SYSTEMS SCIENCE*.

**135 WORLD GEOGRAPHY** SS  
**3 sem. hrs.**

Regional studies of the peoples, languages, religions, economic activities, and settlement patterns of the world.

**138 MAPS AND GEOGRAPHIC REASONING** QR  
**3 sem. hrs.**

Introduction to modern techniques used to visualize and analyze quantitative data in the geosciences. May not be taken under the P/NP option. Formerly *QUANTITATIVE REASONING IN THE GEOSCIENCES*. Prerequisite: MAT 120 or 130 or 145, or consent of the instructor.

**142 HUMAN GEOGRAPHY** UST  
**3 sem. hrs.**

An introduction to geographic dimensions of human, political, cultural, economic, and environmental activity in the United States and within a broader world context. May not be taken under the P/NP option. Not for credit if had GEO 140.

**204 CAREER PREPARATION IN GEOGRAPHY I**  
**1 sem. hr.**

College success and career planning for Geographers. Formerly *DOING GEOGRAPHY*.

**205 LIVING IN THE ENVIRONMENT**  
**3 sem. hrs.**

Interaction between humans and the environment, focusing on the geographical dimensions of natural resource use, pollution, and environmental conservation.

**207 NATURAL DISASTERS** SMT  
**3 sem. hrs.**

Science of earth-related natural disasters: occurrences, causes, effects, prediction, prevention, mitigation, related human activity and classic examples. Two 1-hour lectures; one 2-hour discussion/lab per week. Not for credit Geology or Geography majors.

**208 POLITICAL GEOGRAPHY**  
**3 sem. hrs.**

Introduction to the field of political geography. Emphasis on spatial patterns of political activity. Prerequisite: Completion of 45 semester hours or equivalent or consent of the instructor.

**211 EARTH'S DYNAMIC WEATHER** SMT  
**3 sem. hrs.**

Dynamic aspects of weather and climate from global to local scales with emphasis on how we gather, analyze, and understand weather information. Not for credit Geography major.

**220 ILLINOIS**  
**3 sem. hrs.**

Boundaries, physical setting, environment concerns, patterns of human occupation, regional characteristics. Prerequisite: Completion of 45 semester hours or equivalent or consent of the instructor.

**235 GEOGRAPHY OF EMERGING AREAS** SS  
**3 sem. hrs.**

Current cultural realities of major emerging geographic regions are examined in light of how they affect geography and how geography affects the cultures. Regions vary by topic. Multiple enrollments are allowed if content is different. Contact the Department for availability of the following topics. Prerequisites: COM 110 and ENG 101.

**235A01 GEOGRAPHY OF EMERGING AREAS: AFRICA** SS  
**3 sem. hrs.**

Current cultural realities of major emerging geographic regions are examined in light of how they affect geography and how geography affects the cultures. Prerequisites: COM 110 and ENG 101.

**235A02 GEOGRAPHY OF EMERGING AREAS: LATIN AMERICA** SS  
**3 sem. hrs.**

Current cultural realities of major emerging geographic regions are examined in light of how they affect geography and how geography affects the cultures. Prerequisites: COM 110 and ENG 101.

**235A04 GEOGRAPHY OF EMERGING AREAS: MIDDLE EAST** SS  
**3 sem. hrs.**

Current cultural realities of major emerging geographic regions are examined in light of how they affect geography and how geography affects the cultures. Prerequisites: COM 110 and ENG 101.

**235A07 GEOGRAPHY OF EMERGING AREAS: JAPAN FIELD EXPLORATIONS** SS  
**3 sem. hrs.**

Three week course in Japan to study the current and emerging geographies in cultural, historical, and natural landscapes in a number of sites. Prerequisites: A minimum of 45 hours completed and consent of the instructor.

**238 STATISTICS FOR GEOGRAPHERS I**  
**3 sem. hrs.**

Introduction to uni-variate parametric statistical methods routinely used by geographers.

**250 AFRICA**  
**3 sem. hrs.**

Regional study of Africa. Patterns of society as related to the natural environment. Prerequisite: Completion of 45 semester hours or equivalent or consent of the instructor.

**261 TEACHING SOCIAL SCIENCE IN A GEOGRAPHICAL CONTEXT****3 sem. hrs.**

This course introduces students to all aspects of teaching the social sciences including social foundations, standards, pedagogy, activities, and assessment. Prerequisites: Completion of 45 hours and admission to the Geography Education program and/or consent of the instructor.

**265 OUR NATIONAL PARKS****3 sem. hrs.**

National Parks of the United States in terms of physiography, geology, climate, flora, fauna, and scenic qualities. Prerequisite: Completion of 45 semester hours or equivalent or consent of the instructor.

**292 CAREER PREPARATION IN GEOGRAPHY II****1 sem. hr.**

This course provides tools necessary for geography majors to gain a successful professional practice in internship/student teaching and employment in their field. Prerequisites: GEO 204 and completion of 75 hours or consent of the instructor.

**298A01 PROFESSIONAL PRACTICE: INTERNSHIP ENVIRONMENTAL GEOGRAPHY****1-3 sem. hrs.**

Planned, supervised, paid or unpaid professional practice in environmental geography with a public or private organization. Maximum of 3 hours credit toward the Minor in Environmental Studies; 40 hours internship per semester hour credit. Prerequisite: Prior approval by Minor in Environmental Studies Advisor or Geography, Geology, and the Environment Department Chair. Advanced arrangements required.

**300 CARTOGRAPHY****3 sem. hrs.**

Theory and techniques regarding graphic representation of statistical data, including compilation, drafting, and reproduction of various types of thematic maps. Drafting supplies required.

**303 INTRODUCTION TO GEOGRAPHIC INFORMATION SYSTEMS****4 sem. hrs.**

Fundamental principles of geographic information systems; emphasis on raster and vector based systems and their applications to spatial analysis. Lecture and lab. Prerequisite: Minimum of 30 hours completed or GEO 138 or consent of the instructor.

**304 ADVANCED GEOGRAPHIC INFORMATION SYSTEMS****4 sem. hrs.**

Advanced topics in GIS with an emphasis on spatial analysis methods, database structures, web/mobile GIS, and project management. Lecture and lab. Formerly *GEOGRAPHIC INFORMATION SYSTEMS APPLICATIONS*. Prerequisite: GEO 303 or 363. MAT 120 is recommended.

**305 REMOTE SENSING****4 sem. hrs.**

Basic principles and techniques of satellite and aerial digital image analysis for environmental applications. Lecture and lab. Prerequisite: Minimum of 30 hours completed or GEO 138 or consent of the instructor.

**306 REGIONAL AND AREA STUDIES****1-9 sem. hrs.**

Intensive on-site study of particular lands, environments, cultures, and peoples. Field work required. Multiple enrollments are allowed with different content. Contact the Department for availability of the following topics. Prerequisite: Consent of the instructor.

**306A15 REGIONAL AND AREA STUDIES: WEST TEXAS/NEW MEXICO****1-9 sem. hrs.**

Intensive on-site study of particular lands, environments, cultures, and peoples. Field work required. Prerequisite: Consent of the instructor.

**306A22 REGIONAL AND AREA STUDIES: GEOGRAPHY OF CHICAGO****3 sem. hrs.**

Intensive on-site study of particular lands, environments, cultures, and peoples. Field work required. Prerequisite: Consent of the instructor.

**306A26 REGIONAL AND AREA STUDIES: GEOGRAPHY OF JAPAN****FIELD EXPERIENCE****3 sem. hrs.**

Three-week course in Japan addressing various cultural, historical, and natural landscapes in a number of sites. Prerequisites: Junior/senior standing and consent of the instructor.

**307 TEACHING GEOGRAPHY/ EARTH SCIENCE****3 sem. hrs.**

Approaches to the teaching of geography and earth science in grades 6-12. Includes Clinical Experiences: 35 hours. Prerequisites: Teaching major only. Admission to Professional Studies. Grade of C or better in TCH 216 or concurrent registration. Completion of 8 hours of Geography or Geology.

**308 STATISTICS FOR GEOGRAPHERS II****3 sem. hrs.**

Use and interpretation of basic statistical techniques in geographical problems. Formerly *QUANTITATIVE METHODS IN GEOGRAPHY II*. Prerequisites: GEO 238; MAT 120 or higher recommended.

**310 FIELD GEOGRAPHY****3 sem. hrs.**

Techniques for the systematic acquisition and interpretation of geographic field data. Includes introduction to Orienteering. Prerequisites: Completion of 9 hours of Geography and fieldwork.

**313 ENERGY AND SUSTAINABILITY****3 sem. hrs.**

Human geographic study of energy, covering political, economic, environmental, and societal aspects of energy. Includes sustainability and energy security. Prerequisite: GEO 205 or consent of the instructor.

**315 SEMINAR IN GEOGRAPHY****3 sem. hrs.**

Designed to acquaint the student with career opportunities in geography and in related fields. Includes senior field problem. Prerequisites: GEO 204, 300.

**331 CULTURAL GEOGRAPHY****3 sem. hrs.**

An advanced course in the field and methodology of cultural geography, with an emphasis on the study of place and culture in a globalizing world. Field trip required. Prerequisite: GEO 142 or consent of the instructor.

**334 POLITICAL ECOLOGY****3 sem. hrs.**

Critical examination of how socio-political and economic systems, processes, and practices are linked globally with contemporary environmental problems. Prerequisite: GEO 205 or consent of the instructor.

**336 URBAN GEOGRAPHY****3 sem. hrs.**

Internal morphology, external relationships, and other spatial aspects of cities. Prerequisite: A minimum of 45 hours completed.

**341 CLIMATE AND GLOBAL ENVIRONMENTAL CHANGE****3 sem. hrs.**

An overview of concepts, methods, theory and debates surrounding climate and global environmental change. Prerequisite: GEO 100 or consent of the instructor.

**342 ECONOMIC GEOGRAPHY****3 sem. hrs.**

Investigates the dynamics of the global economy as well as the processes and actors that shape its spatial organization. Prerequisite: GEO 135 or GEO 142 or consent of the instructor.

**344 BIOGEOGRAPHY: DISTRIBUTION OF LIFE****3 sem. hrs.**

Theory and application of the geographic distributions of plants and animals and processes that cause these distributions. Lecture and lab. Prerequisite: GEO 100 or consent of the instructor.

**351 CARTOGRAPHIC DESIGN****3 sem. hrs.**

Advanced techniques in design, production and reproduction of maps. Formerly *CARTOGRAPHIC PROCESSES*. Materials charge optional. Prerequisite: GEO 300.

**370 URBAN AND REGIONAL PLANNING****3 sem. hrs.**

Introduction to the planning process and the major elements used in plan implementation such as zoning regulations, subdivision regulations, and the official map. Field research may be required. Prerequisite: A minimum of 45 hours completed.

**398A01 PROFESSIONAL PRACTICE: INTERNSHIP IN GEOGRAPHY****1-16 sem. hrs.**

Planned, supervised professional experience in a public or private organization. The experience provides an introduction to a career in geography. May be paid. Maximum of 4 hours credit toward Geography major; 40 hours intern/credit hour. Prerequisites: A minimum of 75 hours completed or consent of the internship coordinator; 2.20 GPA.

**Geology Courses****102 PRINCIPLES OF GEOLOGY NS****3 sem. hrs.**

Examination of the principles of geology and the tectonic, rock, hydrologic, and geomorphic cycles in terms of assumptions, forces, products, and consequences. Lecture and lab. Not for credit major/minor. May not be taken under the P/NP option.

**202 EVOLUTION OF THE EARTH SMT****3 sem. hrs.**

Physical, chemical, and biologic evolution of the earth system as interpreted from rock sequences, fossils, and maps. Emphasis on geologic methodology.

**203 MINERALS, ROCKS, FOSSILS AND MAPS****3 sem. hrs.**

Mineral, rock and fossil identification and interpretation; recognition and interpretation of structures and surface features from geologic and topographic maps. Lecture and lab.

**207 NATURAL DISASTERS SMT****3 sem. hrs.**

Science of earth-related natural disasters: occurrences, causes, effects, prediction, prevention, mitigation, related human activity and classic examples. Two 1-hour lectures; one 2-hour discussion/lab per week. Not for credit Geology or Geography majors.

**276 ENVIRONMENTAL GEOLOGY****3 sem. hrs.**

Recognition of geologic hazards such as earthquakes and floods. Evaluation of geologic resources and the legal and geologic limitation of resource utilization. Prerequisite: Completion of 45 semester hours or equivalent or consent of the instructor.

**280 MINERALOGY****4 sem. hrs.**

Crystallography, internal structure, chemistry, recognition and occurrence of minerals. Lecture and lab. Prerequisites: GEO 203; CHE 140.

**285 IGNEOUS AND METAMORPHIC PETROLOGY****4 sem. hrs.**

Description, classification, and origin of igneous and metamorphic rocks. Lecture and lab. Field trip required. Prerequisite: GEO 280.

**287A01 INDEPENDENT STUDY: GEOLOGY****1-6 sem. hrs.**

Intensive work in a special area of the student's interest. Each individual project is to culminate in a comprehensive written report or examination. A maximum of 6 hours may be applied toward graduation. Prerequisite: Consent of the department chair.

**290 STRUCTURAL GEOLOGY****4 sem. hrs.**

Mechanics and processes of deformation of the earth's crust and the resulting structures. Lecture and lab. Field trip required. Prerequisite: GEO 203 required; MAT 144 is recommended.

**295 SEDIMENTOLOGY****3 sem. hrs.**

Origin, transportation, deposition, and diagenesis of sedimentary materials with emphasis on classification of sedimentary rocks. Lecture and lab. Field trip required. Prerequisite: GEO 203.

**296 STRATIGRAPHY****3 sem. hrs.**

Distribution, correlation and analysis of stratified rocks. Lecture and lab. Field trip required. Prerequisite: GEO 295.

**298A20 PROFESSIONAL PRACTICE:  
COOP/INTERN IN GEOLOGY****1-4 sem. hrs.**

Planned, supervised, paid or unpaid professional practice in geology or geotechnical field with government or private organization. Maximum 4 hours toward B.S. degree in Geology. Prerequisite: Consent of the instructor.

**306 REGIONAL AND AREA STUDIES****1-9 sem. hrs.**

Intensive on-site study of particular lands, environments, cultures, and peoples. Field work required. Multiple enrollments are allowed with different content. Contact the Department for availability of the following topics (additional topics are under "Geography Courses"). Prerequisite: Consent of the instructor.

**306A13 REGIONAL AND AREA STUDIES: BIG  
BEND AREA, TEXAS****1-9 sem. hrs.**

Intensive on-site study of particular lands, environments, cultures, and peoples. Field work required. Prerequisite: Consent of the instructor.

**306A15 REGIONAL AND AREA STUDIES:  
WEST TEXAS/NEW MEXICO****1-9 sem. hrs.**

Intensive on-site study of particular lands, environments, cultures, and peoples. Field work required. Prerequisite: Consent of the instructor.

**306A16 REGIONAL AND AREA STUDIES:  
ENVIRONMENTAL FIELD GEOLOGY  
OF ILLINOIS****4 sem. hrs.**

This course is a field camp that is designed to train students in field methods and integrative problem solving related to environmental geosciences in the state of Illinois. Prerequisite: Consent of the instructor.

**306A18 REGIONAL AND AREA STUDIES:  
DEATH VALLEY NATIONAL PARK****2-3 sem. hrs.**

Introduction to the geology and geologic history of Death Valley National Park, California. Students will gain experience in map reading, using geologic compass, measuring a stratigraphic section and structural interpretation. Airfare, food, lodging and transportation are the responsibility of the student. Prerequisite: Consent of the instructor.

**306A19 REGIONAL AND AREA STUDIES:  
PETROLEUM GEOLOGY OF ILLINOIS****2-4 sem. hrs.**

Intensive on-site study of particular lands, environments, cultures, and peoples. Field work required. Prerequisite: Consent of the instructor.

**306A25 REGIONAL AND AREA STUDIES:  
CENTRAL ROCKY MOUNTAINS****1-6 sem. hrs.**

Intensive on-site study of particular lands, environments, cultures, and peoples. Field work required. Prerequisite: Consent of the instructor.

**306A27 REGIONAL AND AREA STUDIES:  
LAKE SUPERIOR PRECAMBRIAN GEOLOGY****3 sem. hrs.**

The structural geology, stratigraphy, paleontology, petrology, and economic geology of the Lake Superior Province in Wisconsin, Michigan, and Illinois. Offered as a combination field and seminar style course. Prerequisite: Consent of the instructor.

**360 GROUNDWATER GEOLOGY****3 sem. hrs.**

Groundwater occurrence and movement, aquifer evaluation, field and lab measurements, contamination and other applications. Field trips. Prerequisites: GEO 203 and MAT 146.

**361 HYDROLOGY****3 sem. hrs.**

Introduction to hydrology, including all components of the hydrologic cycle, field and lab measurements, data acquisition, and quantitative problem solving. Three Saturday field trips required. Prerequisite: MAT 145 or consent of the instructor.

**362 ENGINEERING GEOLOGY****3 sem. hrs.**

Engineering applications of geology, construction problems of geologic origin and their engineering solutions. Field trips required. Prerequisites: GEO 203; MAT 146; and PHY 108 or consent of the instructor.

**363 GIS APPLICATIONS IN GEOLOGY****3 sem. hrs.**

Introduction of geographic information systems applied to geology problems. Includes vector and raster analyses of geologic, environmental, and subsurface features. Prerequisite: GEO 203 required; at least one of the following is recommended: GEO 290, 296, 360, or 380.

**364 EXPLORATION GEOPHYSICS****3 sem. hrs.**

Principles of exploration geophysics and the techniques that are used to study subsurface environments. Subjects reviewed include: stress and strain, information theory, seismic, gravity, magnetics, electrical resistivity, electromagnetic conductivity, ground penetrating RADAR, and borehole logging. Prerequisites: GEO 203; MAT 146; and PHY 108; or consent of the instructor.

**366 VOLCANIC PROCESSES****3 sem. hrs.**

Semester-long seminar course. Nature, behavior, and origin of volcanoes. Magmatic and eruptive processes and volcano construction. Impact of volcanism on Earth's environment. Prerequisites: GEO 280 and 285 or consent of the instructor.

**380 GEOMORPHOLOGY****3 sem. hrs.**

Origin, classification, description, and interpretation of landforms. Field trips. Prerequisite: GEO 100 or 102.

**381 PLANETARY GEOLOGY**

**3 sem. hrs.**

Planets, satellites, and materials that make up our solar system, including how they are studied, their composition, structure, and physiography. Prerequisites: GEO 202 and 203 or consent of the instructor.

**382 GLACIAL AND QUATERNARY GEOLOGY**

**3 sem. hrs.**

Development of glaciers, glacial movements, deposits, and landforms as background for discussion of present landscapes. Field trips required. Prerequisite: GEO 100 or 102.

**385 INVERTEBRATE PALEONTOLOGY**

**4 sem. hrs.**

Examination and analysis of major fossil invertebrate phyla; emphasis on groups with paleoecologic and stratigraphic significance. Lecture and lab. Field trip required. Prerequisites: GEO 203 required. BSC 196 is recommended.

**395 FIELD GEOLOGY**

**6 sem. hrs.**

Application of geologic principles to field mapping and interpretation in the Black Hills and Central Rocky Mountains. Prerequisites: Grade of C or better in GEO 280, 285, 290, 295, and 296.