

★[FRENCH 395 (3)—Lectures prérévolutionnaires]

(Offered when interest is expressed and departmental resources permit.) A study of French literary works before 1789, with the particular topic chosen by instructor or students. May be repeated for degree credit with permission and if the topics are different. *Staff.*

★[FRENCH 396 (3)—Lectures postrévolutionnaires]

(Offered when interest is expressed and departmental resources permit.) Readings in literature of the 19th and 20th centuries, with topic chosen by instructor or students. May be repeated for degree credit with permission and if the topics are different. *Staff.*

★[FRENCH 397 (3)—Séminaire avancé]

(Offered when interest is expressed and departmental resources permit.) Prerequisite: Nine credits chosen from courses numbered between 311 and 328. Topic chosen by instructor or student. May be repeated for degree credit with permission and if the topics are different. *Staff.*

FRENCH 403 (3)—Directed Individual Study

Prerequisites: At least nine credits of 300-level French and permission of the instructor. Nature and content of course to be determined by students' needs and by instructors acquainted with their earlier preparation and performance. May be repeated for degree credit with permission and if the topics are different. *Staff.*

FRENCH 493 (3-3)—Honors Thesis

Interested students should see a member of the French faculty by winter term of their junior year.

Fall-Winter

GEOLOGY

Robinson Foundation

PROFESSORS SPENCER, SCHWAB
ASSISTANT PROFESSOR HARBOR

MAJORS

BACHELOR OF SCIENCE

A major in **geology** leading to a Bachelor of Science degree consists of 50 credits as follows:

1. Geology 160, 210, 310, 330, 350, and a comprehensive examination in geology; Chemistry 111, 112; Physics 111, 112, 113, 114
2. Geology 247 or 340
3. Additional courses to bring the total to 50 must be selected from among Biology 111, 112; Geology 108, 209, 247, 275, 340, 373, 376 (or an approved summer field course), 395, 396, 397, and 472 (four credits) or 493 (six credits)

Additional courses required as prerequisites for completion of the above include Geology 100 or 101 and Mathematics 101.

Independent majors in geophysics or engineering geology may be developed with guidance from the Geology Department for students interested in these areas of study.

BACHELOR OF ARTS

A major in **geology** leading to a Bachelor of Arts degree requires 40 credits as follows:

1. At least 26 credits in geology including at least 16 credits numbered 200 or above
2. Additional courses must be selected from among Accounting 201, 202; Biology 111 or higher; Chemistry 111 or higher; Computer Science 111 or higher; Economics 101, 102, 201; all engineering; all geology; Management 201, 221; all mathematics; Philosophy 108; Physics 111 or higher; Politics 230, 232

A major in **environmental studies in geology** is designed to provide general background in environmental studies with emphasis on geological aspects of the field. Graduate program in environmental studies and environmental sciences are offered at many universities. Some of the programs are centered around particular disciplines such as geology, geography, ecology, engineering, or oceanography. Some are concerned with public policy issues such as land use planning; others are truly interdisciplinary. Students who expect to undertake scientific work in environmental geology should complete the geology major leading to a Bachelor of Science degree. Students with an interest in environmental issues are advised to define their interests as precisely as possible and to consult with faculty members regarding major and course selection.

The major in **environmental studies in geology** leading to a Bachelor of Arts degree requires 40 credits as follows:

1. Geology 100 or 101
2. Geology 135, 160, 201, 247, and 340
3. Geology 397 or 472 (four credits) or 493 (six credits) on an environmental topic
4. Additional courses must be selected from among Biology 111, 112, 230, 240, 245, 330; Chemistry 111; Economics 101, 102 (or 301 if not having taken 101 or 102), 120; Geology 146, 210, 275, 310, 330, 350; Philosophy 108; Politics 230, 232.

HONORS: An Honors Program in geology is offered for qualified students; see department head for details.

★GEOLOGY 100 (4)—General Geology with Field Emphasis

Prerequisite: Permission of the instructor. Same as Geology 101 with special emphasis on field study in the region near Lexington. Contact the instructor for additional information. No credit for students who have completed Geology 101. Laboratory course. *Spencer and Harbor.*

Fall

★GEOLOGY 101 (4)—General Geology

The study of our physical environment and the processes shaping it. The materials and structure of the earth's crust, the origin of the landforms, the concept of geologic time, and the nature of the earth's interior are considered. No credit for students who have completed Geology 100. Laboratory course. *Staff.*

Fall, Winter

★GEOLOGY 102 (3)—History and Evolution of the Earth

An introductory examination of the origin and physical evolution of the earth as inferred from the rock record. Areas of particular emphasis include: (1) the origin of the solar system and differentiation of the planets; (2) the evolution of the terrestrial atmosphere and hydrosphere; (3) explanations for the development of life; (4) organic evolution and interpretations of "mass extinctions"; (5) the changing configuration of continental blocks and ocean basins by continental drift, sea-floor spreading, and plate tectonics; and (6) the growth of continental blocks and their mountain systems. *Schwab.*

Winter

★[GEOLOGY 104 (3)—Planetary Geology]

(Not offered in 1998-99)

Large scale geological features of the earth will be examined and compared with surface features visible on images of other planets and planetary satellites of the solar system. Features examined include those resulting from volcanism, impact cratering, and structure; eolian, fluvial, glacial and periglacial processes; and mass movement. The composition of terrestrial and lunar rocks and extraterrestrial objects is examined. Models of the origin and evolution of planets and their satellites are discussed. *Staff.*

★GEOLOGY 108 (3)—Origin and Evolution of Life

A general survey of the science of paleontology summarizing the changing character of the biosphere over the past four billion years as documented by the fossil record. Major topics include the chemical origin of early organisms; the Cambrian explosion of skeletonization and the Paleozoic conquest of land; mass extinctions; the interplay between the biosphere, atmosphere and hydrosphere; and the use of the fossil record for tracking the origin, development and physical distribution of ancient continental blocks and ocean basins. Students desiring experience in recognition and practical identification from the fossil record should register concurrently for Geology 209. *Schwab.*

Fall

★GEOLOGY 135 (1)—Meteorology

A brief survey of weather and climate including the physical properties of air, planetary circulation, storms, and weather forecasting. *Spencer.*

Winter

★GEOLOGY 140 (3)—Geology of National Parks

An introduction to the regional geologic phenomena of the United States. Many of the national parks, which are chosen for rare geologic conditions, are studied through readings, maps and photographs. Emphasis is on parks covering formative geologic processes, including stream erosion (Grand Canyon, Bryce Canyon), volcanic activity (Mt. Rainier, Hawaiian Volcanoes), glaciation (Rocky Mountain, Glacier Bay), groundwater action (Mammoth Cave) and tectonic uplift (Grand Tetons, Smokey Mountains). Assignments include written reports, map evaluations, and interpretive projects. Optional overnight field trip to the Shenandoah National Park. *Harbor.*

Winter

★GEOLOGY 146 (3)—Geology of Natural Resources
(Alternate years)

Prerequisite: Geology 100 or 101. Geology and geography of mineral, fuel, soil, and water resources. Exploitation techniques, patterns of distribution and use, and environmental aspects are considered. *Schwab.*

Fall

★[GEOLOGY 150 (3)—Water Resources]

(Winter 2000 and alternate years)

Prerequisite: Geology 100 or 101. A seminar examining the quality and quantity of water resources as a limiting factor for future generations. Issues include resource depletion, pollution, historical use and abuse, remediation, and habitat maintenance. Resource constraints are analyzed from a scientific perspective in order to understand or predict water resource problems and solutions. *Harbor.*

★GEOLOGY 160 (3)—Field Geology

Prerequisite: Geology 100 or 101. An introduction to the study of geology in the field with special attention to the methods used by geologists to make, record, and interpret field observations. The course includes study of and field trips in the central Appalachian region. *Spencer.*

Spring

★GEOLOGY 195 (1)—Selected Topics

Selected topical coverage of various subject areas in geology of particular interest for reasons of timeliness, general interest, etc. The topic selected will vary from year to year and be announced in advance of the registration period. Impact and extinction of the dinosaurs, geology of natural resources, computer applications in geology, climatology, and geologic consideration in land use planning are among topics previously studied. May be repeated for a maximum of four degree credits with permission and in different topics. *Staff.*

Fall, Winter

★GEOLOGY 201 (3)—Oceanography

Prerequisite: Geology 100 or 101; Biology 111 or 112; Chemistry 111; or Physics 111 and 113. Introduction to physical oceanography and marine geology; tides, waves, currents, and the interaction of oceans and atmosphere, submarine landscapes; and sedimentary, volcanic, and tectonic activity in the ocean basins. *Spencer.*

Winter

[GEOLOGY 209 (1)—Laboratory Study of the Fossil Record]

(Fall 1999 and alternate years.)

Prerequisite or corequisite: Geology 108. Examination of the fossilized remains of representative species of major groups of organisms. Emphasis is given to those organisms which, due to uneven distribution in the record, are particularly useful in interpreting the age and setting of ancient rocks. *Schwab.*

★GEOLOGY 210 (4)—Mineralogy

Prerequisite: Geology 100 or 101. A study of the crystallography, optics, chemistry, structure, and occurrence of minerals. Laboratory work on mineral hand specimen identification, crystallography, use of the petrographic microscope, X-ray powder diffraction, and SEM/EDS analytical techniques. Laboratory course. *Staff.*

Fall

★GEOLOGY 247 (4)—Geomorphology

Prerequisite: Geology 100 or 101. Investigation of landforms from maps, aerial photographs, digital data, and the analysis of the surficial processes by which they are formed. Laboratory activities include identification and interpretation of topography, field measurements of landscape form and process, and a weekend field trip. Laboratory course. *Harbor.*

Fall

GEOLOGY 275 (3)—Introductory Geophysics

Prerequisite: Geology 100 or 101 or Physics 111 and 113. A review of the geophysical methods used to study the interior of the earth, the magnetic field, isostasy, and earthquake seismology. Attention is given to the methods used in geophysics to collect and analyze data. A gravimeter, a magnetometer, seismic refraction and electrical resistivity equipment are used to collect field data. The data, corrections, and interpretations are incorporated into a technical report for each of the four surveys. *Spencer.*

Fall

GEOLOGY 310 (4)—Igneous and Metamorphic Petrology

Prerequisite: Geology 210. A study of the origin, classification, occurrence and evolution of silicate systems germane to igneous and metamorphic rocks. Laboratory involves characterization of igneous and metamorphic rocks in hand specimen, in thin section, and by chemical analysis. Laboratory course. *Staff.*

Winter

GEOLOGY 330 (4)—Sedimentation and Stratigraphy
(Alternate years)

Properties, origins, and dynamics of sediments and sedimentary rocks. Correlation, organization, and historical interpretation of the sedimentary rock record. Field and laboratory analyses of sedimentary rocks. Laboratory course. *Schwab.*

Fall

GEOLOGY 340 (4)—Hydrology

(Alternate years)

Prerequisites: Geology 100 or 101. Systems and processes of water movement on and below the earth's surface. Encompasses the theoretical and applied aspects of soil moisture, runoff, flooding, groundwater movement, and water well use. Numerical evaluation of flow properties from field and lab data describing water movement in soils, aquifers, and streams. Laboratory course. *Harbor.*

Spring

GEOLOGY 350 (4)—Structural Geology and Tectonics

(Alternate years)

Prerequisites: Geology 160 and Mathematics 101. Description and methods of analysis of large and small scale structural features of the Earth's crust. Rock and soil mechanics, application of structural geology in environmental engineering and resource exploration, structural analysis of satellite imagery, plate tectonics, geometric techniques used in structural analysis, interpretation of geologic maps, and the structural development of mountain systems. Laboratory course. *Spencer.*

Winter

GEOLOGY 373 (3), 376 (6)—Advanced Field Study

Prerequisite or Corequisite: Geology 160 and permission of the instructor. The emphasis and location of the study area will differ from year to year. Information will be made available by the end of the fall term. *Staff.*

Spring

GEOLOGY 395 (1), 396 (2), 397 (3)—Seminar

(Offered when interest is expressed and departmental resources permit.) Prerequisite: Permission of the instructor. The title, term of meeting, and credits for seminars will be announced to all geology majors. May be repeated for degree credit with permission and if the topics are different. A seminar, next offered in Winter 2000, devoted to environmental studies is offered in alternate years. *Staff.*

GEOLOGY 401 (1), 402 (2), 403 (3)—Directed Individual Study

(Offered when interest is expressed and departmental resources permit.) Prerequisite: Permission of the instructor. Advanced work and reading in topics selected by the instructor and meeting the special needs of advanced students. This course may be repeated for degree credit with permission and if the topics are different. Staff.

GEOLOGY 472 (2-2)—Senior Research Thesis

Candidates for the Bachelor of Science degree in geology are urged to undertake research on a field or laboratory problem which can lead to the presentation of a senior thesis. Work on this project should be started in the spring term of the junior year. Interested students should consult members of the faculty who will help define the problem and provide guidance during research.

Fall-Winter

GEOLOGY 493 (3-3)—Honors Thesis

Fall-Winter

GERMAN

(Department of German and Russian)

PROFESSORS CROCKETT, DICKENS
ASSOCIATE PROFESSOR YOUNGBLOOD
INSTRUCTOR FOLLO

MAJOR

A major in **German language** leading to a Bachelor of Arts degree requires at least 39 credits as follows:

1. German 262 (or an approved substitute in German language or a cognate field), 311, 312, 332, 334
2. Six credits from German 303 or from German 301 and 302
3. German 347 or 349
4. Six additional credits in literature chosen from the following: German 313, 314, 315, 316, 318, 320, 321 (if topic is literary), 325
5. The remaining credits must be taken from a list of approved courses, available from the department, with no more than six credits in any one discipline.
6. Students must pass an oral proficiency examination conducted by the department before or during their last term prior to graduation.

A major in **German literature** leading to a Bachelor of Arts degree requires at least 39 credits as follows:

1. German 262 (or an approved substitute in German language or a cognate field) and German 395
2. Six credits from German 303 or from German 311 and 312
3. Three credits in each of the following three groups:
German 313 or 315 German 347 or 349
German 314 or 316
4. Six additional credits in literature chosen from the following: German 313, 314, 315, 316, 318, 320, 321 (if topic is literary), 325, 347, 349, 395
5. The remaining credits must be taken from a list of approved courses, available from the department, with no more than six credits in any one discipline.
6. Students must pass a comprehensive literature proficiency examination conducted by the department before or during their last term prior to graduation.

HONORS: Qualified students may become candidates for Honors in German as early as the first term of their junior year; see department head for details.

GERMAN 111-112 (8 or 5)*—Elementary

These courses are linked; the second must be completed to receive any credit toward degree requirements for the first. A course in elementary German which emphasizes the spoken language as well as grammar and reading. Staff.

Fall-Winter

GERMAN 115 (3)—Elementary

Prerequisite: German 111-112 or the equivalent. The course is designed to provide training in German conversation for students as a transition from the elementary to the intermediate level. Staff.

Spring

*Students with two or more entrance units in German will receive the lower number of credits indicated.