Africana Studies

**10b. Racism.** Fall 2009. ROY PARTRIDGE.
(Same as Sociology 10.)

Art History

**333c. Studies in Seventeenth-Century Art: Caravaggio and Artemisia Gentileschi.**

Economics

**211b - MCSR. Poverty and Redistribution.** Spring 2010. JOHN M. FITZGERALD.

**212b - MCSR. Labor and Human Resource Economics.** Spring 2010. RACHEL EX CONNELLY.

English

**282c. Introduction to Literary and Cultural Theory.** Spring 2010. AARON KITCH.

Sociology

**10b. Racism.** Fall 2009. ROY PARTRIDGE.
(Same as Africana Studies 10.)

Geology

Edward P. Laine, *Department Chair*
Marjorie L. Parker, *Department Coordinator*

*Associate Professors:* Rachel J. Beane, Edward P. Laine, Peter D. Lea, Collin S. Roesler

*Laboratory Instructors:* Cathryn Field, Joanne Urquhart

**Requirements for the Major in Geology**

The major consists of nine courses. Four core courses are required of all majors: Geology 101, 202, 275 or 276, and 393. In addition, to experience the breadth of the discipline, one course must be taken from courses emphasizing the solid earth (220, 241, 262, 265) and one course must be taken from courses emphasizing oceans and surface processes (250, 255, 257, 267, 272, 287). The three remaining elective courses for the major may be selected from the geology courses offered in the department. Note that only one of: (a) 100, 102, or 103 may be counted toward the three elective courses; (b) up to two approved study-away courses may be counted toward the three elective courses; (c) all courses to be counted toward the major need to be completed with a C- or better; (d) independent study does not normally count toward the major requirements; and (e) AP Environmental Science is not accepted toward the major—students may consult the Environmental Studies Program for possible credit. Geology majors are advised that most graduate schools in the earth and environmental sciences require the equivalent of Chemistry 109, Physics 103, and Mathematics 171.
Interdisciplinary Majors
The department participates in formal interdisciplinary programs in geology and physics and in geology and chemistry. See page 212.

Requirements for the Minor in Geology
The minor consists of four courses in geology, including 101, 202, 275/276 and one other geology course. All courses to be counted toward the minor need to be completed with a C- or better.

Introductory, Intermediate, and Advanced Courses
50a - INS. Earthquakes and Volcanoes. Fall 2009. EDWARD LAINE.
   Introduction to the basic plate tectonic structure of the earth and its relationship to the global distribution and types of earthquakes and volcanoes. Exploration of the factors contributing to the origin and styles of eruption of magma from volcanoes. Examination of the history and nature of tsunamis and the volcanic, seismic, and other events that can trigger them. Consideration of the human response to these and other geological hazards and efforts to mitigate them.

100a - INS. Environmental Geology and Hydrology. Every spring. PETER LEA.
   An introduction to aspects of geology and hydrology that affect the environment and land use. Topics include watersheds and surface-water quality, groundwater contamination, coastal erosion, and landslides. Weekly labs and field trips examine local environmental problems affecting Maine rivers, lakes, and coast. (Same as Environmental Studies 100.)

101a - INS. Investigating Earth. Every fall. RACHEL BEANE.
   Dynamic processes, such as earthquakes and volcanoes, shape the earth on which we live. In-class lectures and exercises examine these processes from the framework of plate tectonics. Weekly field trips explore rocks exposed along the Maine coast. During the course, students complete a research project on Maine geology.

102a - INS. Introduction to Oceanography. Fall 2009. COLLIN ROESLER.
   The fundamentals of geological, physical, chemical, and biological oceanography: tectonic evolution of the ocean basins, thermohaline and wind-driven circulation, chemical cycles, primary production and trophodynamics with emphasis on oceans’ role in climate change. Weekly labs will apply the principles in the setting of Casco Bay and the Gulf of Maine. (Same as Environmental Studies 102.)

103a - INS. Marine Environmental Geology. Spring 2010. EDWARD LAINE.
   An introduction to the aspects of marine geology and oceanography that affect the environment and marine resources. Topics include estuarine oceanography and sediments, eutrophication of coastal waters, primary productivity, waves and tides, sea-level history, glacial geology of coastal Maine, harmful algal bloom, and an introduction to plate tectonics. Weekly field trips and labs examine local environmental problems affecting Casco Bay and the Maine coast. A one-day weekend field excursion is required. (Same as Environmental Studies 103.)

202a - INS. Mineralogy. Every spring. RACHEL BEANE.
   Minerals are the earth’s building blocks, and an important human resource. The study of minerals provides information on processes that occur within the earth’s core, mantle, and crust, and at its surface. At the surface, minerals interact with the hydrosphere, atmosphere, and biosphere, and are essential to understanding environmental issues. Minerals and mineral processes examined using hand-specimens, crystal structures, chemistry, and microscopy.
   Prerequisite: One course in geology or permission of the instructor.
Courses of Instruction

[205a - INS. Environmental Chemistry. (Same as Chemistry 205 and Environmental Studies 205.)]

220a - INS. Sedimentary Geology. Every other fall. Fall 2010. Peter Lea.
Survey of earth’s depositional systems, both continental and marine, with emphasis on dynamics of sediment transport and interpretation of the depositional environment from sedimentary structures and facies relationships; stratigraphic techniques for interpreting earth history; and tectonic and sea-level controls on large-scale depositional patterns. Weekly lab includes local field trips.
Prerequisite: One course in geology or permission of the instructor.

224a - INS. Structural Geology. Fall 2009. Rachel Beane.
Geologic structures yield evidence for the dynamic deformation of the earth’s crust. This course examines deformation at scales that range from the plate-tectonic scale of the Appalachian mountains to the microscopic scale of individual minerals. A strong field component provides ample opportunity for describing and mapping faults, folds, and other structures exposed along the Maine coast. In-class exercises focus on problem-solving through the use of geologic maps, cross-sections, stereographic projections, strain analysis, and computer applications.
Prerequisite: Geology 101 or 202, or permission of the instructor.

The geological and geophysical bases of the plate-tectonic model. The influence of plate tectonics on major events in oceanographic and climatic evolution. Deep-sea sedimentary processes in the modern and ancient ocean as revealed through sampling and remote sensing. Focus in the laboratory on the interpretation of seismic reflection profiles from both the deep ocean and local coastal waters.
Prerequisite: One course in geology or permission of the instructor.

[257a. Atmosphere and Ocean Dynamics. (Same as Environmental Studies 253 and Physics 257.)]

Rocks contain many clues about the processes of their formation. This course uses these clues to explore the processes by which igneous rocks solidify from magma, and metamorphic rocks form in response to pressure, temperature, and chemical changes. Laboratory work emphasizes field observations, microscopic examination of thin sections, and computer-based geochemical modeling. Class projects introduce students to aspects of geologic research. Both Geology 101 and 202 are recommended.
Prerequisite: Geology 101 or 202.

An introduction to the interior of the earth, the geophysical basis of plate tectonics, and exploration geophysics. Emphasis on seismic methods. A problem-based service learning course involving work on projects in support of community partners.
Prerequisite: Mathematics 161 or Physics 103, and Geology 100 (same as Environmental Studies 100), 101, 103 (same as Environmental Studies 103), or Physics 104.

Principles and problems in coastal oceanography, with an emphasis on interdisciplinary inquiry. Topics include circulation and sediment transport within estuaries and on the continental shelf, impact of human systems on the marine environment, and issues and controversies of eutrophication and hypoxia in the coastal environment. (Same as Environmental Studies 267.)
Prerequisite: One course in geology or permission of the instructor.
During recent ice ages, glaciers covered a third of the world’s land area and had profound impacts on earth’s landscapes and climates. Uses lectures, labs, field trips, and reading of the primary literature to examine the controls of current and former glacier distribution and movement, landforms and landscapes of glacial and meltwater systems, and the interaction of glaciers and the earth’s climate system.
Prerequisite: One course in geology or permission of the instructor.

The interaction of water and geological materials within the hydrologic cycle, with emphasis on groundwater resources and quality. Qualitative and quantitative examination of the movement of groundwater in aquifers. (Same as Environmental Studies 275.)
Prerequisite: One course in geology or permission of the instructor.

Everyone lives in a watershed, but how do watersheds function, both naturally and increasingly as impacted by humans? Examines the movement and modification of water through the landscape, emphasizing such topics as natural and human controls of water quality, streamflow generation and surface-groundwater interactions, watershed modeling, and approaches to watershed management. Students perform an integrated investigation of a local watershed, examining natural and human controls on hydrologic processes. (Same as Environmental Studies 276.)
Prerequisite: One course in geology or Environmental Studies 201 (same as Biology 158 and Chemistry 105).

Compare and contrast the geography, climate, glaciology and sea ice, ocean biology, and exploration history of the Arctic and Antarctic regions with particular emphasis on the role of polar regions in global climate change. One weekend field trip is required. (Same as Environmental Studies 287.)
Prerequisite: One course in geology or permission of the instructor.

291a–294a. Intermediate Independent Study in Geology. The Department.

The modern world is experiencing rapid climate warming and some parts extreme drought, which will have dramatic impacts on ecosystems and human societies. How do contemporary warming and aridity compare to past changes in climate? Are modern changes human-caused or part of the natural variability in the climate system? What effects did past changes have on global ecosystems and human societies? Students use sediment and growth records (ocean, glacier, lake, coral, tree ring, and rodent middens) to assemble proxies for past changes in climate, atmospheric CO₂, and disturbance to examine several issues: long-term carbon cycling and climate, the rise of C4 photosynthesis and the evolution of grazing mammals, orbital forcing and glacial cycles, glacial refugia and post-glacial species migrations, climate change and the rise of human civilizations, climate/overkill hypothesis of Pleistocene megafauna, climate variability, drought cycles, climate change impacts on fire, climate-related collapses of human civilizations, and determining natural variability vs. human-caused climate change. Prior enrollment in a 200- or 300-level environmental studies or geology course is recommended. (Same as Biology 302 and Environmental Studies 302.)
Prerequisite: One of the following: Biology 102, 104, 105, 109, or Geology 101.
A rigorous treatment of the earth’s climate, based on physical principles. Topics include climate feedbacks, sensitivity to perturbations, and the connections between climate and radiative transfer, atmospheric composition, and large-scale circulation of the oceans and atmospheres. Anthropogenic climate change will also be studied. (Same as Environmental Studies 357 and Physics 357.)
Prerequisite: Physics 229, 255, 256, or 300, or permission of the instructor.

[393a. Advanced Seminar in Geology. (Same as Environmental Studies 393.)]

401a–404a. Advanced Independent Study and Honors in Geology. The Department.

German

Birgit Tautz, Department Chair
Kate Flaherty, Department Coordinator

Professors: Helen L. Cafferty, Steven R. Cerf
Associate Professor: Birgit Tautz
Assistant Professor: Jill S. Smith†
Visiting Faculty: Matthew D. Miller
Teaching Fellow: Manuel Meffert

The German department offers courses in the language, literature, and culture of the German-speaking countries of Europe. The program is designed for students who wish to become literate in the language and culture, comprehend the relationship between the language and culture, and gain a better understanding of their own culture in a global context. The major is a valuable asset in a wide variety of postgraduate endeavors, including international careers, law and graduate school.

Requirements for the Major in German
The major consists of seven courses, of which one may be chosen from 151, 152, 154, 156, 158, and the others from 205–402. Normally, majors take two courses numbered 313 or higher in their senior year. Prospective majors, including those who begin with first- or second-year German at Bowdoin, may arrange an accelerated program, usually including study abroad. Majors are encouraged to consider one of a number of study-abroad programs with different calendars and formats.

Requirements for the Minor in German
The minor consists of German 102 or equivalent, plus any four courses, of which two must be in the language (203–398).

First-Year Seminar
For a full description of first-year seminars, see pages 149–60.

( Same as Film Studies 29, Gay and Lesbian Studies 29, and Gender and Women’s Studies 29.)