
EARTH SCIENCES (EASC)

EASC 100 Physical Geology (4 credits)

This course is an introduction to the processes that formed and continue to shape the earth. Lecture topics include continental drift, rock and mineral forming processes, and the effects of agents of erosion such as glaciers, streams and waves. The laboratories develop skill in rock identification and map interpretation. Three hours of lecture and one two-hour laboratory period weekly. *Either semester* (CNSL)

EASC 101 Historical Geology (4 credits)

Prerequisite: EASC 100

This course is an introduction to the origin and evolution of the earth. Topics include the development and transformation of continents, ocean basins, the atmosphere and life over geologic time. An emphasis is placed on modeling earth's evolution from observations of the rock record. The laboratory fosters development of field and quantitative skills. Three hours of lecture and one two-hour laboratory weekly. *Spring semester*

EASC 102 History of the Earth (3 credits)

The geologic origin and evolution of the planet earth is surveyed in this course. An emphasis is placed on the co-evolution of life and the changing surface environment over geologic time. *Spring semester* (CNSN)

EASC 194 Environmental Geology (3 credits)

This course introduces students to the application of geologic principles in recognizing and controlling the effects of environmental problems such as earthquakes, volcanoes, floods, beach erosion, hazardous waste disposal and ground water quality. *Either semester* (CNSN)

EASC 199 First Year Seminar (3 credits)

Prerequisite: Open to all freshmen with a writing placement score of 3 or above or a SAT score of 500 or above. Students with 24 or more transfer credits will have this requirement waived.

First Year Seminars (FYS) are writing-intensive, topic courses that introduce students to academic thought, discourse and practices. FYS courses prepare and orient students toward productive and fulfilling college careers by actively engaging them in a specific academic area of interest. Students will improve their writing, reading, research and basic information and technology skills while learning to work both collaboratively and independently. These courses will fulfill the First Year Seminar requirement and may fulfill other requirements for the core curriculum. Each course may fulfill different requirements and topics may change each semester. Only one FYS course may be taken for credit. (CFYS)

EASC 210 Oceanography (3 credits)

Prerequisite: Any 100-level biology, chemistry, earth science, geography (physical science), or physics course

This course surveys the physical and chemical aspects of earth's ocean, including the geology of the seafloor, ocean currents,

tides, waves, sediment transport and deposition, seawater chemistry and submarine hot springs. An emphasis is also placed on oceanographic research expeditions and the tools used by scientists to explore the seafloor. *Spring semester* (Formerly EASC 305)

EASC 215 Solar System Astronomy (3 credits)

Prerequisite: Any 100-level biology, chemistry, earth science, geography (physical science) or physics course

This course focuses on the physical, chemical, geological and biological processes operating in the solar system. Topics include celestial mechanics, radiation and spectroscopy, solar processes, planetary interiors, surfaces and atmospheres, the origin of life and theories of the origin and evolution of the solar system. *Fall semester* (Formerly EASC 301)

EASC 240 Hydrology (4 credits)

Prerequisite: Consent of instructor

This course examines the hydrologic cycle, including precipitation, infiltration, evaporation, transpiration, stream flow and groundwater flow. The laboratory will focus on field measurements with an emphasis on modeling of groundwater flow from a physical and chemical perspective. Basic water laws and regulations, as well as contamination issues are also reviewed. Two hours of lecture and one four-hour laboratory weekly. *Spring semester*

EASC 250 Geomorphology (4 credits)

Prerequisite: EASC 101

This course examines the natural processes that control the development of earth's surface topography on many different scales. The role on internal processes such as tectonics is explored in addition to surface processes related to the action of rivers, glacial ice, wind, waves, currents and tides. Laboratory work focuses on the identification and interpretation of landforms on topographic maps. Two hours of lecture and one four-hour laboratory weekly. *Fall semester* (Formerly EASC 284)

EASC 260 Mineralogy (4 credits)

Prerequisite: EASC 101 and CHEM 131 or CHEM 141

This course investigates the minerals that compose the solid earth. Topics to be covered include the physical and chemical properties of minerals, mineral structures, mode of occurrence, mineral formation and crystallography. Laboratory work will involve mineral identification using visual observation and state-of-the-art analytical equipment including X-ray diffraction and optical microscopy. Two hours of lecture and one four-hour laboratory weekly. (Formerly EASC 372)

EASC 280 Vertebrate Paleontology (3 credits)

Prerequisite: EASC 101

This course examines the nearly 500 million-year history of vertebrate life on Earth and the origin of the major innovations that characterize its diversity. This diversity will be considered in the light of various classification methods, and the major innovations will be discussed in the context of various mechanisms of evolution. *Fall semester*

EASC 298 Second Year Seminar (Speaking Intensive) **(3 credits)**

Prerequisite: ____199; *Open to all sophomores and juniors who have completed ENGL 101, and the speaking skills requirement. Students with 54 or more transfer credits will have this requirement waived. Cannot be taken if ____299 is taken for credit.*

Second Year Seminars (SYS) are speaking-intensive, topic courses that build on the academic skills and habits introduced in the First Year Seminar. SYS courses engage students in a specific academic area of interest and provide them with the opportunity to reinforce, share and interpret knowledge. Students will improve their speaking, reading, research and basic information and technology skills while building the connections between scholarship and action that are required for lifelong learning. These courses will fulfill the Second Year Seminar requirement and may fulfill other requirements for the core curriculum. Each course may fulfill different requirements and topics may change each semester. Only one SYS course may be taken for credit. (CSYS)

EASC 299 Second Year Seminar (Writing Intensive) **(3 credits)**

Prerequisite: ____199; *Open to all sophomores and juniors who have completed ENGL 101 and ENGL 102. Students with 54 or more transfer credits will have this requirement waived. Cannot be taken if ____298 is taken for credit.*

Second Year Seminars (SYS) are writing-intensive, topic courses that build on the academic skills and habits introduced in the First Year Seminar. SYS courses engage students in a specific academic area of interest and provide them with the opportunity to reinforce, share and interpret knowledge. Students will improve their writing, reading, research and basic information and technology skills while building the connections between scholarship and action that are required for lifelong learning. These courses will fulfill the Second Year Seminar requirement and may fulfill other requirements for the core curriculum. Each course may fulfill different requirements and topics may change each semester. Only one SYS course may be taken for credit. (CSYS)

EASC 320 Geology of New England (3 credits)

Prerequisite: EASC 101

This course will examine the geological history of New England and adjacent areas with an emphasis on the last 500 million years of geologic time. In this context, the tectonic history of New England will be explored in detail. Other important topics include the changing surface environment with a focus on ice ages and climate change. The laboratory will emphasize the use of geologic maps and field trips to areas of geologic significance in southeastern New England. Two hours of lecture and one four-hour laboratory period weekly. *Fall semester*

EASC 350 Structural Geology (4 credits)

Prerequisite: EASC 250

This course explores the origin and analysis of rock structures produced by deformation. Laboratory exercises involve the construction and interpretation of geologic maps and geometric analysis of rock structures. Field trips will emphasize mapping

skills and the interpretation of rock sequences. Two hours of lecture and one four-hour laboratory weekly. *Spring semester (Formerly EASC 283)*

EASC 360 Petrology (4 credits)

Prerequisite: EASC 260

This course explores the properties, occurrences, origin and classification of the igneous, metamorphic and sedimentary rocks that compose the solid earth. Laboratory work will include the examination of rocks through visual observation and thin section analyses using the optical petrographic microscope. Field trips will examine the geology of southeastern New England. Two hours of lecture and one four-hour laboratory weekly. *Spring semester (Formerly EASC 463) (CWRM)*

EASC 370 Sedimentology and Stratigraphy (4 credits)

Prerequisite: EASC 101

This course examines the composition, texture, morphology and dynamics of sediments in different environments and their relation to the stratification and structure of sedimentary rocks. The laboratory work fosters the development of research skills through quantitative analyses of sediment and a term project consisting of a thorough description and interpretation of sediment samples collected from a local/regional sedimentary environment. Two hours of lecture and one four-hour laboratory weekly. *Fall semester (Formerly EASC 476)*

EASC 450 Geochemistry (4 credits)

Prerequisite: CHEM 142

This course explores the application of thermodynamic principles to solve geologic problems. The chemical interaction of rock and water will be emphasized, as it relates to the chemistry of natural waters on and near the surface of the earth, rock weathering and global geochemical cycles. Laboratory work will include the analytical techniques used to measure water chemistry and computer modeling of natural geochemical systems. Two hours of lecture and one four-hour laboratory weekly. *Fall semester, odd years (Formerly EASC 311)*

EASC 460 Geophysics (4 credits)

Prerequisite: PHYS 182 or PHYS 244

In this course, students will apply physics to solve geological problems. Topics include seismology, the Earth's gravitational and magnetic fields, heat flow, plate tectonics and the internal structure of the Earth. The laboratory involves problem solving and field measurements using modern geophysical equipment to image the subsurface. Geophysical techniques relevant to oil, gas and mineral exploration as well as engineering and environmental applications are examined. Two hours of lecture and one four-hour laboratory weekly. *Fall semester (Formerly EASC 310)*

EASC 470 Paleontology (4 credits)

Prerequisite: EASC 370

This course includes a survey of the last 500 million years of the Earth's fossil record. The most recent developments in the origin and diversification of the animal phyla are considered along with their environmental relationships. The laboratory sessions involve

tMay be taken for graduate-level credit

quantitative methods in the study of fossils. Two hours of lecture and one four-hour laboratory weekly. *Spring semester (Formerly EASC 475)*

EASC 471 Coastal Processes (3 credits)

Prerequisite: MATH 100; and EASC 100 or GEOG 121

The frequently complex fluid-solid interactions which result in erosion and deposition in coastal environments are developed in this course. Methods of measurement and prediction are presented. (Formerly EASC 380)

EASC 480 Remote Sensing (4 credits)

Prerequisite: Consent of instructor

Remote sensing is the measurement and characterization of the earth using satellites and airborne platforms. This course covers the theory of remote sensing and the acquisition, analysis and interpretation of image data collected from the visible, infrared, microwave and thermal portions of the electromagnetic spectrum. Laboratory work will emphasize digital image processing of the surface environment using state-of-the-art image-analysis software. Two hours of lecture and one four-hour laboratory weekly. (Formerly EASC 317)

EASC 485 Contaminant Hydrogeology (3 credits†)

Prerequisite: EASC 240; and CHEM 132 or CHEM 142

The fate and transport of groundwater contaminants in various hydrogeologic regimes are presented in this course. Methods for conducting hydrogeologic investigations are discussed in detail. (Formerly EASC 440)

EASC 490 Field Methods in Geology (4 credits)

Prerequisite: EASC 350 and EASC 360

In this course, basic field techniques used by geologists to create geologic maps are introduced. An emphasis will be placed on the collection, processing, and interpretation of field data collected from study areas in Massachusetts and Rhode Island. Students will be required to write formal geologic reports involving maps, cross-sections and supporting data. Two hours of lecture and one four-hour laboratory weekly. *Spring semester*

EASC 495 Research Methods in Geology (3 credits)

Prerequisite: Consent of instructor

In this course, students work as a research group on a semester-long project in the faculty member's geological sub-discipline. Students will perform an extensive literature review, develop the methodology to answer the research question, participate in data collection and analysis, and communicate the research findings to the department and the wider college community. The opportunity also exists to present the research findings at a professional conference or in a scientific journal publication depending on the quality and significance of the results.

EASC 496 Seminar in Geology (1 credit each semester†)

Prerequisite: Senior standing in geology, earth science or chemistry/geology

This course focuses on the development of thought concerning current global models and/or continuing controversies in geology. One credit will be earned per semester for a total of two credits to be awarded at the end of the second semester.

Fall semester

EASC 497 Research in Earth Science (1-3 credits)

Prerequisite: Consent of instructor

In this course, students work independently on a research project in consultation with a faculty mentor. The project may be designed solely by the student or through discussions with the faculty mentor and culminates with a research paper. The course is intended for more advanced students who have completed course work related to the research project. This course may be repeated for up to six credits. *Either semester*

EASC 498 Internship in Earth Science (3-6 credits)

Prerequisite: Consent of the department; formal application required

This course provides an opportunity for earth science majors to gain practical job experience in some aspects of earth/environmental science. Possible internships include positions in local, state and federal agencies as well as private corporations and consulting firms. This course may be repeated for a maximum of six credits. *Either semester*

EASC 499 Directed Study in Earth Science (1-3 credits)

Prerequisite: Consent of the department; formal application required

Directed study is open to juniors and seniors who have demonstrated critical and analytical abilities in their studies and who wish to pursue a project independently. May be taken twice for a maximum of six credits. *Either semester*

EASC 560 Special Topics in Earth Science (variable credit)

This course will cover special topics of current relevance in earth science education. The topic to be addressed will be announced prior to registration. May be taken more than once with the consent of the adviser.

Other Approved Courses

EASC 290 Dinosaur Paleobiology
EASC 300 Excursions in Geology
EASC 315 Computer Applications in Earth Science
EASC 400 Earth Systems Science I
EASC 410 Earth Systems Science II
EASC 501 Observational Astronomy
EASC 502 Research
EASC 503 Directed Study
EASC 504 Observational Meteorology
EASC 550 Modern Developments in Earth Science

†May be taken for graduate-level credit

Note: This section is arranged in course number order. See pages 237-238 (course prefix key) for assistance in locating department sections.

Note: See Catalog Web Addenda at www.bridgew.edu/catalog/addenda as that information supersedes the published version of this catalog.