GEO 103

OBJECTIVES
Familiarity with general facts, principles and concepts of Earth and Earth Processes
1 2 5 6 7 8

Identify Earth materials and use simple geological tools
10

Become familiar with geologic data, as displayed in graphical and pictorial form
9 13

EXPERIENTIAL COMPONENT
Develop strategies to determine earth properties (such as the size, shape, and weight of the earth) from first principles and simple measurements
11

Carry out simple field analysis of RI geology at selected locales
12

PORTFOLIO PRODUCT

Lab assignments

11 17

GEO 150

OBJECTIVES
Be familiar with concept of geological time and its theoretical basis;
2

Understand basic stratigraphic principles;
4 3 18

Understand Geology as a historical science;
16 20 21

Acquire basic experience in geological field methods (measurement of stratigraphic sections; simple field mapping) in the context of the reconstruction of Earth history.
2 9

EXPERIENTIAL COMPONENT
Use of basic mapping skills to identify and understand successions of rocks and the ancient environments they represent

9 20 22 24

Calculate simple radiometric age of rocks and minerals, given processed isotopic data and equations

PORTFOLIO PRODUCT

Short (ca. 5 pages) paper
33

Measured section and/or simple geological map
9 18 23

GEO 210

OBJECTIVES
Identify and recognize the non-randomness of landforms.
13 22

Understand the geologic processes that produce landforms.
1 18

Characterize geomorphic features and identify the geomorphic processes responsible for observed landforms.
24 26

EXPERIENTIAL COMPONENT
Use topographic maps and aerial photographs to characterize and identify landforms produced by a variety of geological processes.
20 27 23

Use selected field methods to actively investigate the relationship between process and observed geomorphic features.
25 27 28

PORTFOLIO PRODUCT
Project report from multi-week coastal processes field exercise.
30 31 33

GEO 320

OBJECTIVES
Identify and characterize Earth materials; recognize criteria for distinguishing them;
10

Understand basic physico-chemical processes of Earth material formation;
15 17

Understand role of tectonic settings and geological processes on specific mineral/rock occurrences;
Apply above in the field.
22 26

EXPERIENTIAL COMPONENT
Hands-on discovery of how to classify minerals & rocks
10 25

Field observations involving laboratory and lecture concepts
22

PORTFOLIO PRODUCT
Summary paper describing how and why knowledge of Earth materials is fundamental to further study in the Geosciences.
33

GE**O 370**

OBJECTIVES
Identify and interpret earth structures, on a micro- to macro- scale, with an emphasis upon brittle structures (i.e., faults and fractures)
11

Collect and interpret qualitative and quantitative structural data in the field;
11 17

Carry out simple *detailed structural analyses* of common geologic phenomena;
18 23 24

Understand the relationships amongst the earth's internal energy sources, plate tectonics, and structural features;
15

Apply tenets of continuum mechanics to interpretation of earth structure;
15 32

Have familiarity with major stages in the geologic evolution of New England;

Assess and interpret selected geohazards, such as earthquakes and landslides, in terms of stress and strain
26 27 28

EXPERIENTIAL COMPONENT
Laboratory and field exercises including: 1) collection of structural data; 2) manipulation and interpretation of data, through use of orthographic and stereographic projections, and computer modeling; 3) construction of structural profiles and related diagrams; 4) identification of styles of deformation, at thin section to outcrop scale, with emphasis placed upon discrimination between brittle *vs*. ductile structures.
29 30 31

Field analysis of deformed rocks in southern New England
23 25

PORTFOLIO PRODUCT

Ten laboratory exercises are based upon an imaginary field locale (based upon U. California field camp). Portfolio products include labs plus a capstone report on the locale;
30 31 33

Detailed geologic maps and cross sections, with stereographic projections, of geologic sites in the area.
30 31 33

GEO 3XX

OBJECTIVES
Recognize natural and human geohazards;
31

Be able to describe in detail the causes and effects of the following short- and long-term geohazards, and their impact on society: earthquakes, volcanic eruptions, riverine and coastal flooding, landslides, global warming;
30 31

Be able to predict the magnitude and likelihood of events such as floods or earthquakes for specific locales;
18

Be able to assess the primary and secondary costs of such events;
31

Be familiar with those geohazards of relevance to New England
38 42 43

EXPERIENTIAL COMPONENT

Use of internet and other resources in preparation of Case Study and paper;
7 30 34

Interview geologists and other persons involved in geohazard assessment and management.
39 40

PORTFOLIO PRODUCT
Case study of a geohazard or event (e.g., Loma Prieta earthquake) that has received considerable attention in recent years;
36 438 39

GEO 450

OBJECTIVES

Understand basic principles of facies and depositional environments.
1

Understand and use basic concepts such as transgression and regression.
3

Ability to use said basic principles and concepts to interpret rock sequences.
10

Ability to use basic lab techniques to determine texture and composition of sediment and sedimentary rocks in hand sample and thin section.
10

EXPERIENTIAL COMPONENT

Laboratory and field exercises including: 1) measuring a section in Proterozoic rock in the Boston Basin, and 2) interpreting facies and stratification in a trench dug by them across a Rhode Island beach.
11 12 13

PORTFOLIO PRODUCT
Selected laboratory and field trip reports, including a capstone exercise constructing a series of depositional environmental maps.14 20

GEO 483

OBJECTIVES
Understand basic principles of ground-water flow.
1 15

Ability to use basic techniques to interpret hydrogeologic data.
15 17 19

Ability to identify an appropriate approach for addressing a given hydrologic problem.
27 28 29

EXPERIENTIAL COMPONENT
Project: characterizing the hydrogeology of the Chipuxet Aquifer.
23

Students use a variety of field, laboratory and interpretive techniques to describe and understand the hydrogeology of the aquifer system.
23 28

PORTFOLIO PRODUCT
Project report on the hydrogeology of the Chipuxet Aquifer.
33

GEO 484

OBJECTIVES
Understand physical principles governing contaminant fate and transport
1 8 15

Interpret complex environmental data sets
18 19

Predict the fate and transport of contaminants

Formulate strategies for polluted site investigation and clean-up
22 23 25

EXPERIENTIAL COMPONENT
Project: Fate and transport of contaminants. Students use a variety of laboratory and interpretive techniques to analyze and predict the the behavior of pollutants in the environment. 25 26 29 42

PORTFOLIO PRODUCT
Presentation and project report on the fate and transport of a particular contaminant class.

32 33 34 44

GEO 488 (COLO PLATEAU TRIP)

OBJECTIVES

Be familiar w/ rock sequences in the field;
10

Understand and apply lithostratigraphic principles;
3

Recognize and reconstruct paleoenvironments;
3 34

Understand the evolution of paleoenvironments over geological time; and
2 3 20 21

Synthesize undergraduate learning to solve geological problems (capstone course)
22 40 41

EXPERIENTIAL COMPONENT

Fieldwork necessary to accomplish outcomes; geological mapping with topographic maps; measuring of columnar sections; observation of lithological features; use of pocket transit and/or geological compass; interpretation of same.
17 24 25

PORTFOLIO PRODUCT

Measured sections and facies map;
9 18

Paleoenvironmental reconstructions
9 14 16