

FR 468 Workshop in French (1–3). As announced. (May be repeated for a maximum of 6 credits.)

FR 491 Directed Study (1–3). Independent study. (May be repeated for a maximum of 4 credits.) Prerequisite: consent of instructor.

FR 493 Topics in French (1–3). As announced. (May be repeated for credit.)

Geography (GEOG)

GEOG/ANTH 103 Humans and Their Environments (3).

GEOG/ANTH 233 People and Cultures of the World (3).

GEOG/GEOL 304 Geomorphology (3). Concurrent enrollment: GEOG/GEOL 304L.

GEOG/GEOL 304L Geomorphology Laboratory (1). Concurrent enrollment: GEOG/GEOL 304.

Geology (GEOL)

GEOL 113 The Geological Environment (3). Geological processes and hazards, resources and environmental problems including pollution, global warming and waste disposal. For non-majors only. GEOL 113L optional. (F, S)

GEOL 113L The Geological Environment Laboratory (1). Materials and processes of the solid earth. Optional: if taken, a student must enroll concurrently in GEOL 113 or after taking GEOL 113.

GEOL 123 Earth Resources (3). The occurrence, exploitation and use of Earth resources including metals, agricultural chemicals and minerals, industrial rocks and minerals, energy resources, soil and water resources. GEOL 123L is optional. (F)

GEOL 123L Earth Resources Laboratory (1). Identification and study of important rock and mineral commodities. Solving of practical problems faced by resource geologists. Concurrent enrollment: GEOL 123. (F)

GEOL 151 Physical Geology (3). The study of earth materials and the important internal and surface processes shaping the earth. A field trip is required. Concurrent enrollment: GEOL 151L. (F)

GEOL 151L Physical Geology Laboratory (1). Materials and processes of the solid earth. Three hours laboratory work per week. Concurrent enrollment: GEOL 151. (F)

GEOL 152 Historical Geology (3). Evolution of the earth's surface and the biosphere; ancient environments and plate tectonics. A field trip is required. Prerequisites: GEOL 113/113L or 151/151L. Concurrent enrollment: GEOL 152L. (S)

GEOL 152L Historical Geology Laboratory (1). Fossils, geological environments and processes. Three hours laboratory work per week. Concurrent enrollment: GEOL 152. (S)

GEOL 268 Workshop in Geology (1–3). As announced. (May be repeated for a maximum of 4 hours.)

GEOL 293 Topics in Geology (1–3). As announced. (May be repeated for credit with permission of advisor.)

GEOL/BIOL 302 Invertebrate Paleontology (3). Morphology, classification and phylogeny of invertebrate fossils. Fossils in stratigraphic correlation and in reconstruction of sedimentary paleoenvironments. A field trip is required. Prerequisites: GEOL 152/152L (open to biology majors without prerequisite). Concurrent enrollment: GEOL 302L. (Alt F)

GEOL/BIOL 302L Invertebrate Paleontology Laboratory (1). Identification, morphology and practical applications of invertebrate fossils. Three hours laboratory work per week. Concurrent enrollment: GEOL 302. (Alt F)

GEOL 303 Crystallography-Mineralogy (3). Crystal symmetry, crystal chemistry, optical and x-ray crystallography, systematic mineralogy. A field trip is required. Prerequisites: CHEM 151/151L, 152/152L (completed or in progress). Concurrent enrollment: GEOL 303L. (Alt F)

GEOL 303L Crystallography-Mineralogy Laboratory (1). Crystal symmetry; identification of minerals using physical and optical properties and x-ray diffraction. Three hours laboratory work per week. Concurrent enrollment: GEOL 303. (Alt F)

GEOL/GEOL 304 Geomorphology (3). The origin and development of landforms and relationship of geomorphic principles to human activities. One or more field trips required. Prerequisites: GEOL 151/151L. Concurrent enrollment: GEOL 304L. (Alt S)

GEOL/GEOL 304L Geomorphology Laboratory (1). Laboratory analysis of landforms and topographic features; topographic maps and photointerpretation. Three hours laboratory per week. Concurrent enrollment: GEOL 304. (Alt S)

GEOL 311 Stratigraphy and Sedimentation (3). Correlation of stratigraphic units; interpretation of ancient environments from the sedimentary rock record; methods of stratigraphic and sedimentological analysis. A field trip is required. Prerequisites: GEOL 152/152L. Concurrent enrollment: GEOL 311L. (Alt S)

GEOL 311L Stratigraphy and Sedimentation Laboratory (1). Rock types, environments of deposition and stratigraphic mapping. Three hours laboratory work per week. Concurrent enrollment: GEOL 311. (Alt S)

GEOL 312 Structural Geology (3). Description, classification and origin of folds, faults, joints and other geologic structures; theory of stereographic projections and structural geologic map interpretation. A field trip is required. Prerequisites: GEOL 151/151L; MATH 120. Concurrent enrollment: GEOL 312L. (Alt S)

GEOL 312L Structural Geology Laboratory (1). Visualizing structures in three dimensions; line projections, solid geometry, faulting and geologic mapping. Three hours laboratory work per week. Concurrent enrollment: GEOL 312. (Alt S)

GEOL 313 Photogeology (2). Aerial photographs for interpretation of geological features; photogrammetric principles and methods of photogeologic mapping. Prerequisites: GEOL 304/304L. Concurrent enrollment: GEOL 313L. (Alt S)

GEOL 313L Photogeology Laboratory (1). Photogrammetric principles and photointerpretation; preparation of photogeologic maps. Four hours laboratory work per week. Concurrent enrollment: GEOL 313. (Alt S)

GEOL 324 Regional Field Geology (1). Mandatory attendance on eight-to-ten-day field trip, one two-hour classroom or field session per week before and after the trip. The structure, stratigraphy, geomorphology, economic geology and other pertinent geologic characteristics of selected areas; field instrumental methods. Preparation of a road log and/or other assigned material in addition to examination. (May be repeated up to 4 hours.) Students will be required to pay their own expenses. Prerequisites: GEOL 151/151L, 152/152L. (S)

GEOL 332 Geologic Instruments and Field Methods (1). The theory of the Brunton compass, telescopic alidade, altimeter; application to field problems. One four-hour class/field period per week. Prerequisites: GEOL 151/151L, 152/152L; MATH 120. (Alt S)