EARTH SCIENCE (ERSC)

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ERSC Courses

ERSC 1144 Introduction to Earth Science (3 units)
Term Typically Offered: F

Survey of fundamental processes of Earth science. Application of systems thinking to understand the dynamic interactions among geologic, hydrological, biological, and atmospheric components of the Earth system. Explore how geographic, soil, and human factors shape the Earth. Field trip required. 2 lectures, 1 laboratory. Formerly ERSC 144.

ERSC 2250 Physical Geography (3 units)
Term Typically Offered: F

Systems and processes responsible for the Earth's patterns of weather, climate, and landforms. Atmospheric circulation, severe weather, climate change, hydrologic cycle, tectonics, volcanism, and fluvial, coastal, and glacial landscapes. Emphasis on interactions between humans and the natural environment. Course may be offered in classroom-based, online, or hybrid format. 3 lectures. Crosslisted as ERSC/GEOG 2250. Formerly ERSC/GEOG 250.

ERSC 3303 Soil Erosion and Water Conservation (3 units)
Term Typically Offered: SP
Prerequisite: One of the following: GEOG 218, GEOG 2218, LA/NR 218, and LA/NR 2218; and SS 120 or SS 1120.

Evaluation of soil and water conservation with agriculture, rangeland, and urban land applications. Processes, regulation, and best management practices for soil erosion, water quality, and stormwater. Development of stormwater pollution prevention or farm water quality plans to meet regulatory requirements. Field trip required. 2 lectures, 1 activity. Formerly ERSC 303.

ERSC 3325 Climate and Humanity (3 units)
Term Typically Offered: TBD
Prerequisite: Junior standing. Recommended: One of the following: ERSC 144, ERSC 1144, GEOG 250, or GEOG 2250.

Geographic perspective on the interrelationships between climate and human cultures. Effects of people on climate and the influence of climate and weather upon human activities and behavior. Focus on global human conditions which are responsible for the alteration of climate and in turn are vulnerable to climate change. Course may be offered in classroom-based or hybrid format. 3 lectures. Crosslisted as ERSC/GEOG 3325. Formerly ERSC/GEOG 325.

ERSC 3335 Soil, Water, and Civilization (3 units)
Term Typically Offered: TBD
2026-28 or later: Upper-Div GE Area 2/5
2020-26 catalogs: Upper-Div GE Area B
Sustainability Focused
Prerequisite: Junior standing; completion of GE Area 1 with grades of C- or better (GE Area A for the 2022-26 catalog); completion of GE Area 2 with a grade of C- or better (GE Area B4 for the 2022-26 catalog); and completion of GE Area 5 (GE Areas B1 to B3 for the 2022-26 catalog).

Explore past civilizations and how management of soil, water, and other natural resources allowed them to flourish, decline, or fail. Sustainability of natural resource use in modern/future societies. Issues include sustainability, agricultural practices, deforestation, water quality, and land management. Course may be offered in classroom-based, online, or hybrid format. 3 lectures. Fulfills GE Areas Upper-Division 2 or Upper-Division 5 (GE Area Upper-Division B for students on the 2022-26 catalog). Formerly ERSC 335.

ERSC 4400 Special Problems for Advanced Undergraduates (1-4 units)
Term Typically Offered: F, SP
Prerequisite: Consent of instructor.

Individual investigation, research, studies, or surveys of selected problems. Repeatable up to 12 units. Crosslisted as ERSC/SS 4400. Formerly ERSC/SS 400.

ERSC 4414 Global and Regional Climatology (3 units)
Term Typically Offered: TBD
Prerequisite: One of the following: ERSC/GEOG 250, ERSC/GEOG 2250, ERSC 144, or ERSC 1144.

Earth's pattern of climates and the physical processes that account for them. Interrelationships between climate and the physical/biological and cultural environments. Modern climate changes and their consequences. 3 lectures. Crosslisted as ERSC/GEOG 4414. Formerly ERSC/GEOG 414.

ERSC 4415 Applied Meteorology and Climatology (3 units)
Term Typically Offered: TBD
Prerequisite: One of the following: ERSC/GEOG 250, ERSC/GEOG 2250, ERSC 144, or ERSC 1144.

Physical processes in the atmosphere that determine regional weather, climate and climate variability. Surface and satellite systems for weather observation, and weather/climate modeling. Dynamics of weather systems, including thunderstorms and hurricanes. Emphases on weather/climate affecting agriculture and other human activities. 2 lectures, 1 activity. Crosslisted as ERSC/GEOG 4415. Formerly ERSC/GEOG 415.

ERSC 4442 Applied Groundwater Hydrology (4 units)
Term Typically Offered: F
Prerequisite: One of the following: BRAE 236, BRAE 2236, BRAE 340, BRAE 3340, ERSC 144, ERSC 1144, GEOL 201, GEOL 2240, SS 120, or SS 1120; one of the following: MATH 141, MATH 221, MATH 1261, or MATH 1267; and one of the following: PHYS 121, PHYS 141, PHYS 1121, or PHYS 1141.

Applied field methods of vadose zone and groundwater flow modeling, confined and unconfined aquifer flow characterization, well installation, monitoring, and sustainable groundwater management. Groundwater modeling with COMSOL, MODFLOW, and AQTESOLV. 3 lectures, 1 laboratory. Formerly ERSC 442.

ERSC 4443 Applied Environmental Contaminant Transport (4 units)
Term Typically Offered: F
Prerequisite: One of the following: BRAE 236, BRAE 340, BRAE 2236, BRAE 3340, ERSC 144, ERSC 1144, GEOL 201, GEOL 2240, SS 120, or SS 1120; one of the following: MATH 141, MATH 221, MATH 1261, or MATH 1267; and one of the following: CHEM 110, CHEM 124, CHEM 127, CHEM 1110, CHEM 1120, or CHEM 1122.

Applied study of mechanisms of fate and transport of contaminants in soils and groundwater. Field methods and technologies of soil and groundwater sampling and site characterization. Conceptual and mathematical models, case studies, laboratory study of breakthrough behavior, and remediation technologies. Field trip required. 3 lectures, 1 laboratory. Formerly ERSC 443.

ERSC 4450 Geomorphology (3 units)
Term Typically Offered: F
Prerequisite: GEOL 201 or GEOL 2240.

Evaluation of processes shaping landscapes. Field-based production of surficial geologic maps. Field, aerial photograph, and topographic map analysis assessing processes shaping landscapes. Interpretation of landforms and landform relationships. Assessing tectonic and climate influences on landscapes. Field trip required. 2 lectures, 1 laboratory. Formerly ERSC 423.

ERSC 4470 Special Advanced Topics (1-4 units)
Term Typically Offered: TBD
Prerequisite: Consent of instructor.

Directed group study of special topics for advanced students. The Class Schedule list topic selected. Repeatable up to 12 units. 1 to 4 lectures. Crosslisted as ERSC/SS 4470. Formerly ERSC/SS 470.

ERSC 4471 Special Advanced Laboratory (1-4 units)
Term Typically Offered: TBD
Prerequisite: Consent of instructor.

Directed group laboratory study of special topics for advanced students. The Class Schedule will list topic selected. Repeatable up to 8 units. 1 to 4 laboratories. Crosslisted as ERSC/SS 4471. Formerly ERSC/SS 471.

ERSC 4476 Senior Project - Advanced Internship Experience in Environmental Science/Management (2 units)
Term Typically Offered: TBD
Prerequisite: Senior standing; completion of GE Area 1 with grades of C- or better (GE Area A for the 2020-26 catalogs); one of the following: NR 306, NR 326, NR 363, NR 3306, NR 3326, or NR 3363; and consent of instructor.

Independent internship experience conducted under faculty supervision focusing on a discipline area of environmental science/management. Completion of a project as a component of the internship. Crosslisted as ERSC/NR 4476. Formerly ERSC/NR 476.

ERSC 4477 Senior Project - Research Experience in Environmental Science (2 units)
Term Typically Offered: TBD
Prerequisite: Senior standing; completion of GE Area 1 with grades of C- or better (GE Area A for the 2020-26 catalogs); and one of the following: NR 306, NR 326, NR 363, NR 3306, NR 3326, or NR 3363.

Guided research experience in a specific area of environmental science. Implementation of materials and methods. Collection, analysis and interpretation of data. Completion of formal written report. 1 lecture, 1 laboratory. Crosslisted as ERSC/NR 4477. Formerly ERSC/NR 477.

ERSC 4478 Senior Project - Current Topics in Environmental Science (2 units)
Term Typically Offered: F, SP
Prerequisite: Senior standing; completion of GE Area 1 with grades of C- or better (GE Area A for the 2020-26 catalogs); and one of the following: NR 306, NR 326, NR 363, NR 3306, NR 3326, or NR 3363.

Critical evaluation and formal presentation of current issues in environmental science/management. Evaluation of current topics, analysis of supporting evidence, and synthesis and presentation of resulting perspectives on different approaches to current challenges in environmental science/management. Satisfies the senior project requirement. 2 lectures. Crosslisted as ERSC/NR 4478. Formerly ERSC/NR 478.

ERSC 4479 Senior Project - Independent Study (2 units)
Term Typically Offered: TBD
Prerequisite: Senior standing; completion of GE Area 1 with grades of C- or better (GE Area A for the 2020-26 catalogs); and one of the following: NR 306, NR 326, NR 363, NR 3306, NR 3326, or NR 3363; and consent of instructor.

Selection and completion of a project under faculty supervision. Projects typical of problems that graduates must solve in their fields of employment. Project results are presented in a formal report. Crosslisted as ERSC/NR 4479. Formerly ERSC/NR 479.

ERSC 5570 Special Advanced Topics (1-4 units)
Term Typically Offered: TBD
Prerequisite: Graduate standing and consent of instructor.

Directed group study of special topics for advanced students. The Class Schedule will list topic selected. Repeatable up to 12 units. 1 to 4 seminars. Formerly ERSC 570.

ERSC 5571 Special Advanced Laboratory (1-4 units)
Term Typically Offered: TBD
Prerequisite: Graduate standing and consent of instructor.

Directed group laboratory study of special topics for advanced students. The Class Schedule will list topic selected. Repeatable up to 8 units. 1 to 4 laboratories. Formerly ERSC 571.