

B.S. in Environmental Science

The new Environmental Science major is designed to give students a strong scientific background while allowing them the flexibility to choose courses that address their specific interests.

Requirements for the major are summarized below. For the full major requirements, refer to the Undergraduate Bulletin.

Declaring the major

Students may apply for admission to the environmental sciences major upon completion of a minimum of 24 credit hours from the University or from an accredited college or university, and with a minimum grade point average (GPA) of 2.80 on a 4.00 scale.

Course Requirements

1. General Ed. Requirements:

- Group 1: Competency.... Same as other science majors: ENGL 101, 102; Two 100-level history courses, at least on non-U.S. history, foreign language proficiency at the 122 level.
- Group 2: Quantitative.... MATH 141, 142, and STAT 515
- Group 3: Humanities.... 1 fine arts course (same choices as other science majors) and
Choose 1 course from ECON 221, 223 OR 224 and
Choose 1 ethics course from PHIL 331, 312, 317, 318, 321, 341, 360, 514, 550
- Group 4: Social Sciences.... POLI 201 and
Choose 1 course from ECON 221, 223, 224 and
Choose 1 course from ENVR 548 (=ECON 548) or POLI 478
- Group 5: Laboratory Sci.... BIOL 101 and 102 OR MSCI 101 and 102 and
CHEM 111 and 112 and
Choose 1 Earth Science course from GEOL 101, 103, 201 or
GEOG 201 and
PHYS 201 and 201L OR PHYS 211 and 211L

Pre-Major Requirements: ENVR 201 and 202

- Major Requirements:***
- BIOL 301 and 301L, Ecology and Evolution
 - Choose 3 of 4 courses from:
 - GEOG 202, Weather and Climate
 - GEOL 315, Surface and Near Surface Processes
 - ECIV 350, Introduction to Environmental Engineering
 - ENHS 660, Concepts of Environmental Health Science
 - ENVR 590, Senior Seminar
 - 17-18 hours (6 courses) of additional environmentally-related courses selected with the help of a faculty advisor – see list of approved courses starting on the next page.

A list of courses that can be used to meet the 17-18 hour upper-level courses requirement starts on the next page, followed by samples of possible course schedules for incoming first-year students.

SELECTED COURSES WITH ADVISOR APPROVAL (17-18 HOURS)

Students, in consultation with their assigned advisor, must develop a program of study which either provides a broad set environmental science courses or allows students to focus in a defined area. Given the current course offerings and faculty expertise at the University, if a student wanted to focus their elective course work, possible areas include: Natural Systems, Climate and Weather, Water Resources, Energy, or Humans and the Environment. All Students' selective courses should include at least 2 courses taken at the 500 level, no more than 3 should be from a single discipline and no more than one Research Methods course

COURSES ACCEPTABLE FOR MAJOR CREDIT

From the School of the Environment:

- ENVR 500--Environmental Practicum. (3)
- ENVR 221 – Environmental Pollution and Health {=ENHS 221} (3)

From the Life Sciences: (for course descriptions see unit listing)

- BIOL 302 -- Cell and Molecular Biology. (3)
 - BIOL 330 -- Microbiology. (3)
 - BIOL 330L -- Microbiology Laboratory. (1)
 - BIOL 420 -- Survey of the Plant Kingdom. (3)
 - BIOL 420L -- Survey of the Plant Kingdom Laboratory. (1)
 - BIOL 450 -- Principles of Biological Oceanography. {=MSCI 450} (3)
 - BIOL 460 -- General Physiology. (3)
 - BIOL 541 -- Principles of Biochemistry. {=CHEM 550} (3)
 - BIOL 541L -- Principles of Biochemistry Laboratory. {=CHEM 550L} (1)
 - BIOL 549 -- Plant Physiology. (4)
 - BIOL 552 -- Population Genetics. {=MSCI 552} (3)
 - BIOL 570 -- Principles of Ecology. (3)
 - BIOL 570L -- Principles of Ecology Laboratory. (1)
 - BIOL 575 -- Marine Ecology. {=MSCI 575} (3)
 - BIOL 575L -- Marine Ecology Laboratory. {=MSCI 575L} (1)
 - BIOL 640 -- Microbial Ecology. (3)
 - BIOL 671 -- Plant Responses to the Environment. (3)
- (Other BIOL courses may be selected as approved by student's advisor)
- CHEM 321 -- Quantitative Analysis. (3)
 - CHEM 321L -- Quantitative Analysis Laboratory. (1)
 - CHEM 333 -- Organic Chemistry I. (3)
 - CHEM 333L -- Comprehensive Organic Chemistry Laboratory I. (2)
 - CHEM 334 -- Organic Chemistry II. (3)
 - CHEM 334L -- Comprehensive Organic Chemistry Laboratory II. (2)
 - CHEM 623 -- Introductory Environmental Chemistry. (3)
 - CHEM 624 -- Aquatic Chemistry. {=MSCI 624} (3)

From the Earth and Marine Sciences:

- GEOL 202 -- Rocks and Minerals (4)
- GEOL 305 -- Earth Systems through Time. (4)
- GEOL 315 -- Surface and Near Surface Processes (4)
- GEOL 335 -- Processes of Global Environmental Change. (4)
- GEOL 371 -- A View of the River. (3)
- GEOL 524 -- Environmental Radioisotope Geochemistry. {=MSCI 524} (3)
- GEOL 548 -- Environmental Geophysics. (3)
- GEOL 557 -- Coastal Processes. {=MSCI 557} (3)
- GEOL 560 -- Earth Resource Management. (3)
- GEOL 570 -- Environmental Hydrogeology. (3)
- GEOL 571 -- Soil Hydrology. (4)
- GEOL 575 -- Introduction to Groundwater Modeling. (3)

GEOL 581 -- Estuarine Oceanography {=MSCI 581} (3)
(Other GEOL courses may be selected as approved by student's advisor)
MSCI 305 -- Ocean Data Analysis. (3)
MSCI 312 -- Physical and Chemical Oceanography (4)
MSCI 521 -- Introduction to Geochemistry {=ECIV 521} (3)
MSCI 566 -- Ecosystem Analysis. (3)
MSCI 582 -- Marine Hydrodynamics. {=GEOL 582} (3)

From the Geographical Sciences:

GEOG 202 -- Weather and Climate. (4)
GEOG 346 -- Climate and Society. (3)
GEOG 347 -- Water as a Resource. (3)
GEOG 348 -- Biogeography. (3)
GEOG 349 -- Cartographic Animation. (3)
GEOG 363 -- Geographic Information Systems. (3)
GEOG 530 -- Environmental Hazards. (3)
GEOG 545 -- Synoptic Meteorology. (4)
GEOG 546 -- Applied Climatology. (4)
GEOG 547 -- Fluvial Geomorphology. (3)
GEOG 549 -- Water and Watersheds. (3)
GEOG 551 -- Principles of Remote Sensing. (3)
GEOG 554 -- Spatial Programming. (3)
GEOG 562 -- Satellite Mapping and the Global Positioning System. (3)
GEOG 563 -- Advanced Geographic Information Systems. (3)
GEOG 564 -- GIS-Based Modeling. (3)
GEOG 567 -- Long-Term Environmental Change. {=GEOL 567}(3)
GEOG 568 -- Human Dimensions of Global Environmental Change. (3)
GEOG 569 -- Environment and Development. {=ANTH 569} (3)
GEOG 570 -- Geography of Public Land and Water Policy. (3)
GEOG 571 -- Microclimatology. (4)
GEOG 573 -- Climatic Change and Variability. (3)

From Mathematics, Statistics and Engineering:

CSCE 206 -- Scientific Applications Programming. (3)
CSCE 567 -- Visualization Tools. (3)
ECHE 300 -- Chemical Process Principles. (3)
ECHE 310 -- Introductory Chemical Engineering Thermodynamics. (3)
ECHE 311 -- Chemical Engineering Thermodynamics. (3)
ECHE 567 -- Process Safety, Health, and Loss Prevention. (3)
ECHE 589 -- Special Advanced Topics in Chemical Engineering. (3)
ECIV 350 -- Introduction to Environmental Engineering. (3)
ECIV 350L -- Introduction to Environmental Engineering Laboratory. (1)
ECIV 362 -- Introduction to Water Resources Management. (3)
ECIV 405 -- Systems Applications in Civil Engineering. (3)
ECIV 551 -- Elements of Water and Wastewater Treatment. (3)
ECIV 555 -- Principles of Municipal Solid Waste Engineering. (3)
ECIV 556 -- Air Pollution Control Engineering. (3)
ECIV 557 -- Sustainable Construction for Engineers. (3)
ECIV 558 -- Environmental Engineering Process Modeling. (3)
ECIV 560 -- Open Channel Hydraulics. (3)
ECIV 562 -- Engineering Hydrology. (3)
ECIV 563 -- Subsurface Hydrology. (3)
ECIV 570 -- Land Development for Engineers. (3)
EMCH 290 -- Thermodynamic Fundamentals. (3)
EMCH 529 -- Sustainable Design and Development. (3)
EMCH 553-- Fuel Cycles. (3)
EMCH 561N -- Current Topics in Mechanical Engineering—Nuclear Energy and the Hydrogen Economy. (1-3)

EMCH 592 -- Introduction to Combustion. (3)
 EMCH 594 -- Solar Heating. (3)
 EMCH 597 -- Thermal Environmental Engineering. (3)
 ENGR 290 -- Thermodynamic Fundamentals. (3)
 ENGR 540 -- Environmentally Conscious Manufacturing. (3)
 MATH 523 -- Mathematical Modeling of Population Biology. (3)
 STAT 516 -- Statistical Methods II. (3)
 STAT 517 -- Computing in Statistics. (3)
 STAT 518 -- Nonparametric Statistical Methods. (3)
 STAT 520 -- Forecasting and Time Series. {=MGSC 520} (3)
 STAT 528 -- Environmental Statistics (3)

From the Health Sciences:

ENHS 221 – Environmental Pollution and Health {=ENVR 221} (3)
 ENHS 333 -- Sanitation and Environmental Health. (3)
 ENHS 660 -- Concepts of Environmental Health Science. (3)
 ENHS 665 – Biofilms in the Environment and Disease. (3)
 ENHS 670 -- Environmental Pollutants and Human Health. (3)

Research Methods courses: *(Not required, but if selected; only one of these three may be taken for credit towards the major)*

CSCE 145--Algorithmic Design I. (4)
 EMCH 111 -- Introduction to Econometrics. (3)
 ECIV 111 -- Introduction to Engineering Graphics and Visualization. (3)

First semester courses for the proposed major are very similar to those for other science majors. Many combinations are possible, with some examples below:

Example 1

UNIV 101	3 Cr
MATH 141	4 Cr
PHYS 201 + Lab	4 Cr
HIST 106	3 Cr
SPAN 122	3 Cr
<u>PEDU 176</u>	<u>1 Cr</u>
	18 hours

Example 3

ENGL 101	3 Cr
MATH 141	4 Cr
GEOL 201	4 Cr
ECON 221	3 Cr
<u>PHIL 311</u>	<u>3 Cr</u>
	17 hours

Example 2

UNIV 101	3 Cr
MATH 141	4 Cr
CHEM 111	4 Cr
GERM 109	3 Cr
<u>ENGL 101</u>	<u>3 Cr</u>
	17 hours

Example 4

HIST 106	3 Cr
MATH 141	4 Cr
BIOL 101	4 Cr
GERM 110	3 Cr
ENGL 101	3 Cr
<u>PEDU 152</u>	<u>1 Cr</u>
	18 hours