

# Environmental Science - Natural Resources Concentration, BS (121F)

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Program Code: 121F

CIP Code: 03.0104

## General Education Requirements (44 Hours)

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- General Education Requirements

*CHE 1101/CHE 1110 & CHE 1102/CHE 1120 fulfills Science Inquiry. MAT 1110 or STT 2820 fulfills Quantitative Literacy requirement.*

## Major Requirements (86 Hours)

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Not including 12 hours already counted in General Education Requirements, above.

2.0 major GPA is required for graduation. Major GPA calculation will include all courses taken in the major department, plus any other courses under Major Requirements. Minimum of 18 semester hours of courses taken to fulfill major requirements must be courses offered by Appalachian.

## Environmental Science Core Requirements (35-36 Hours)

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- BIO 1801 - Biological Concepts I (4)
- BIO 1802 - Biological Concepts II (4)
- CHE 1101 - Introductory Chemistry I (3)
- CHE 1110 - Introductory Chemistry Laboratory I (1)
- CHE 1102 - Introductory Chemistry II (3)
- CHE 1120 - Introductory Chemistry Laboratory II (1)
- GES 1010 - Introduction to Environmental Sciences (3)
- GES 1101 - Introduction to Physical Geology (4)
- MAT 1110 - Calculus With Analytic Geometry I (4)
- STT 2820 - Reasoning with Statistics (4)
- PHY 1103 - General Physics I (4)
- or
- PHY 1150 - Analytical Physics I (5)

## **Additional Geological and Environmental Science Courses (11-13 Hours)**

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*GES 2750 [WID] must be taken in the Sophomore or Junior year.*

- GES 2250 - Evolution of the Earth (4)
- GES 2750 - Preparation for Careers in the Earth and Environmental Sciences (3) [WID]
- GES 2752 - Environmental Science Field Methods (1)
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- CHE 3310 - Global Biogeochemical Cycles (3)
- Or
- GES 3310 - Global Biogeochemical Cycles (3)
- OR
- CHE 4620 - Environmental Chemistry (4)
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- GES 4105 - Analysis and Implications of Environmental Issues (1) [CAP]
- OR
- GES 4510 - Senior Honors Thesis (3) [CAP]

## **Geospatial data analysis (6 Hours)**

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*If a course is chosen in one part of the program of study, it may not be used elsewhere in the program of study.*

- GHY 2812 - Geospatial Technology in a Changing World (3)
- or
- PLN 2812 - Geospatial Technology in a Changing World (3)
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- GES 3140 - Quantifying Environmental Change (3)
- GHY 3310 - Environmental Remote Sensing (3)
- GHY 3812 - Geographic Information Systems (3)

## **Computational and Multivariate data analysis (6 Hours)**

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*If a course is chosen in one part of the program of study, it may not be used elsewhere in the program of study.*

- CS 2435 - Introduction to Scientific Programming (4)
- GES 3140 - Quantifying Environmental Change (3)
- GES 3455 - Quantitative Data Analysis for Earth and Environmental Scientists (3)
- GES 4025 - Introduction to Multivariate Data in the Earth and Life Sciences (3)

## **Natural Resources Electives (21 Hours)**

Choose at least one course from each category. If a course is chosen in one category, it may not be used elsewhere in the program of study. Some general education courses may be double counted. At least 15 credit hours must be from laboratory classes at the 2000 level or higher; at least 12 credit hours must be GES classes at the 2000 level or higher.

### **Life Sciences and Conservation Category**

- GES 3025 - Principles of Paleontology (3)\*
- GES 3810 - The Reef Environment and Geology of Modern Carbonate Systems (3)\*
- BIO 2000 - Introduction to Botany (4)\*
- BIO 2001 - Introduction to Zoology (4)\*
- BIO 2012 - Introduction to Evolutionary Biology (3)
- BIO 3340 – Dendrology (4)\*
- BIO 4513 - Plant Molecular Biology (4)\*
- BIO 4551 - Ornithology (4)\*
- BIO 4552 - Entomology (4)\*
- BIO 4555 - Plant Physiology (4)\*
- BIO 4556 - Mycology (4)\*
- BIO 4557 - Ichthyology (4)\*
- BIO 4559 - Mammalogy (4)\*
- BIO 4560 - Herpetology (4)\*
- BIO 4567 - Lichenology (3)
- BIO 4569 - Invertebrate Zoology (4)\*
- BIO 4571 - Plant-Insect Interactions in Terrestrial Ecosystems (4)\*
- BIO 4575 - Ecotoxicology (4) [CAP]\*
- BIO 3302 - Ecology (4)\*
- BIO 3313 - Global Change Ecology (4) [WID]\*
- BIO 4620 - Landscape Ecology (4)\*
- BIO 4240 - Aquatic Biology (4)\*
- BIO 4110 - Conservation Genetics (3)
- GHY 3130 - Geography of Biodiversity (3)
- SD 3100 - Principles of Agroecology (3)
- SD 3200 - Agroforestry and Farm Forestry Systems (3)

### **Soil, Water, and Air Category**

- GES 3160 - Intro to Geophysics (3)\*
- GES 3140 - Quantifying Environmental Change (3)\*
- GES 4630 - Hydrogeology (3)\*
- GES 4705 - Engineering Geology (3)\*
- GES 3810 - The Reef Environment and Geology of Modern Carbonate Systems (3)\*
- GES 1104 - Water: Mountains to Sea (4)
- BIO 3320 - Air Pollution Effects on Plants and People (3)
- BIO 3310 - Marine Sciences (4)\*

*Sneak preview – coming in Fall 2024 (may have minor changes)*

- CHE 2210 - Quantitative Analysis (3) and CHE 2211 - Quantitative Analysis Laboratory (1)\*
- CHE 4620 - Environmental Chemistry (4) [CAP]\*
- GHY 3100 - Weather and Climate (3)
- GHY 3110 - Ecoregions and Dynamic Landforms (3)
- GHY 3600 - Snow and Ice (3)
- IDS 3010 - H<sub>2</sub>O: We are Water (3)
- PHY 3150 - Atmospheric Science (3)
- SD 3155 - Soil and Soil Fertility Management (3)
- TEC 3606 - Sustainable Water and Wastewater Technology (3)

### **Policy, Planning, and Communication Category**

- GES 2301 - Energy Extraction in Appalachia (Past, Present, and Future) (3) [GenEd]
- Or
- AS 2301 - Energy Extraction in Appalachia (Past, Present, and Future) (3) [GenEd]
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- GES 3110 - Environmental Regulation and Enforcement (3)
- ANT 4360 - Primate Conservation (3)
- BIO 3315 - Conservation Biology (3) [WID]
- COM 3117 - Environmental Communication (3)
- ECO 2620 - Environmental and Resource Economics (3) [GenEd: SS]
- ECO 4621 - Environmental Economics and Policy (3)
- IDS 2450 - Introduction to Not-for-Profit Organizations (3)
- GHY 2200 - National Park Approaches to Animal Preservation (3) [GenEd: SS]
- GHY 3320 - Environmental Issues in Appalachia (3) [WID]
- GHY 4810 - Satellites, Drones, and Spatial Analysis (3)
- GHY 4812 - GIS Analysis and Modeling (3)
- GHY 4816: GIScience and Water Resources (3)
- GHY 4818: Web Mapping (3)
- PLN 2410 - Town, City and Regional Planning (3) [GenEd: SS]
- PLN 3730 - Land, Property, and Law (3)
- PLN 4030 - Planning for Climate Resilience (3)
- PLN 4460 - Environmental Policy and Planning (3)
- PHL 2015 - Environmental Ethics (3)
- PS 4670 - Environmental Politics (3)
- PS 4675 - Politics of Climate Change (3)
- RM 2140 - Natural Resources: Becoming an Informed Citizen (3) [GenEd: HS]
- RM 3155 - Wilderness First Responder (3)
- SD 2400 - Principles of Sustainable Development (3)
- SD 2800 - Environmental Justice and Sustainable Development (3)
- SD 3610 - Issues in Environmental Sustainability (3) [WID]
- SD 3700 - Environment and Development in the Global South (3)
- SD 3420 - Agroecology for Climate Action (3) [WID]
- SD 3675 - Outreach Skills for Sustainability (3)

*Sneak preview – coming in Fall 2024 (may have minor changes)*

- SD 4300 - The Politics of Sustainable Development (3)
- SD 3365 - Conservation and Development (3)
- TEC 2601 - Energy Issues and Technology (3)
- TEC 3604 - Sustainable Transportation (3)

### **Environmental Science Capstone Course (at least 1 Hour)**

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*(Prerequisite: Senior Standing)*

- GES 4105 - Analysis and Implications of Environmental Issues (1) [CAP]
- GES 4510 - Senior Honors Thesis (3)

### **Note**

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*\*Pre-/Co-requisites are not included in the 120 hours required for the degree.*

### **Minor (optional)**

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### **Electives (2-6 hours)**

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Taken to total a minimum of 120 hours for the degree

### **Total Required (120 Hours)**