

**Bachelor of Science**  
**ENVIRONMENTAL SCIENCE**

In order to be considered for acceptance to this major, you must first have been admitted to Northern, satisfying all requirements for regular status. Second, you must meet the following departmental requirements: 1) have earned a cumulative grade point average of 2.50 for courses to be accepted into the program, which includes up to 35 credits in general education; 2) completion of 24 credits of the GECC Laboratory Science requirements; 3) completion of ES 112, ES 112L, and ES 113; and 4) submission of a personal essay and two letters of recommendation to the Environmental Science program director.

**GENERAL EDUCATION (58 hrs)**

**Communications (9 hrs)**

ENG 111 English Composition I (3)

SPCH 130 Public Speaking (3)

Choose **one** of the following:

ENG 116 Technical Writing (3)

ENG 112 English Composition II (3)

**Social/Behavioral Sciences (6-9 hrs) \***

You must select survey courses from *at least two different discipline areas* from the following list:

ANTH 101/L Physical Anthropology w/Lab (4)

ANTH 102 Introduction to Social and Cultural Anthropology (3)

ANTH 111 Language and Culture (3)

ANTH 207 Cultures of New Mexico (3)

GEOG 111 World Geography (3)

PSCI 110 The Political World (3)

PSCI 200 American Politics (3)

PSY 105 General Psychology (3)

SOC 101 Introduction to Sociology (3)

SOC 220 Social Problems (3)

SOC 225 Marriage and the Family (3)

**Humanities and Fine Arts (6-9 hrs) \***

PHIL 220 Ethics (3)

You must select **two** survey courses from *at least two different discipline areas* from the following list:

ART 105 Introduction to Art (3)

ART 107 History of Art (3)

ENG Literature courses numbered 260-298 (3)

HIST 101 Western Civilization I (3)

HIST 102 Western Civilization II (3)

HIST 161 History of the U.S. to 1877 (3)

HIST 162 History of the U.S. from 1877 (3)

HIST 260 History of New Mexico (3)

HUM 101 Humanities I (3)

HUM 102 Humanities II (3)

MUS 105 Music Appreciation (3)

PHIL 110 Introduction to Philosophical Problems (3)

PHIL 220 Ethics (3)

THE 120 Introduction to Theatre I (3)

THE 130 History of Theatre (3)

THE 220 Introduction to Theatre II (3)

THE 238 Teatro Chicano (3)

\* You must complete at least 15 crs between these two areas, maintaining at least two disciplines in each area.

## MATH AND SCIENCE

### **Mathematics/Computer Science (10 hrs)**

MATH 145 Introduction to Probability and Statistics (3)

MATH 150 College Algebra (3)

MATH 162 Calculus I (4)

### **Laboratory Sciences (24 hrs)**

BIOL 202 Genetics (3)

BIOL 202L Genetics Lab (1)

BIOL 203 Ecology and Evolution (3)

BIOL 203L Ecology and Evolution Lab (1)

BIOL 210 Microbiology (3)

BIOL 210L Microbiology Lab (1)

CHEM 121 General Chemistry I (3)

CHEM 121L General Chemistry I Lab (1)

Choose **one** of the following:

ES 201 Environmental Physical and Chemical Processes (3)

ES 201L Environmental Physical and Chemical Processes Lab (1)

**or**

CHEM 122 General Chemistry II (3)

CHEM 122L General Chemistry II Lab (1)

CHEM 210 Integrated Organic & Biochemistry (3)

CHEM 210L Integrated Organic & Biochemistry Lab (1)

### **HEALTH, PHYSICAL EDUCATION & RECREATION (1 hr)**

Electives (1)

### **PROGRAM REQUIREMENTS (36 hrs) REQUIRED FOR ALL CONCENTRATIONS**

ES 112 Introduction to Environmental Sciences I (3)

ES 112L Introduction to Environmental Sciences I Lab (1)

ES 113 Introduction to Environmental Sciences II (3)

ES 125 Principles of Physical Hydrology (3)

ES 203 Introduction to GIS/GPS and Cartography (2)

ES 307 Atmospheric Science (3)

ES 320 Environmental Ethics (3)

ES 338 Environmental Law and Regulations (3)

ES 350 Watershed Hydrology and Management (3)

ES 401 Community Participation in Environmental Planning (3)

ES 412 Environmental Health and Toxicology (3)

ES 415 Energy and Resource Development (3)

ES 480 Senior Capstone - Field Experience (3)

### **Students will choose from one of the following concentrations areas:**

#### **Agriculture Concentration (34 hrs)**

BIOL 360 Botany (3)

BIOL 360L Botany Lab (1)

ES 225 Principles of Agricultural Ecology (3)

ES 308 Invasive Species (3)

ES 311 Plant Pathology (3)

ES 340 Principles in Crop Production (3)

ES 365 Principles of Sustainable Agriculture (3)

ES 410 Soil Testing and Interpretation (3)

ES 411 Soil Management and Fertility (3)

ES 416 Irrigation and Drainage (3)

ES 457 Economics, Food, and Agriculture in Industrial Development (3)

Electives (3 hrs) Upper-division courses as approved by department advisor

**Environmental Science Concentration (34 hrs)**

ES 121 Environmental Air Monitoring (3)  
ES 238 Environmental Lab Instrumentation (3)  
ES 330 Principles of Environmental and Occupational Health (3)  
RAD 234L Introduction to Radiation Science and Technology (4)  
ES 315 Technology and the Environment (3)  
ES 333 Radiation Biology (3)  
ES 336 Environmental Sampling and Instrumentation (3)  
ES 400 Environmental Management (3)  
ES 402 Environment, Economics, and Sustainability (3)  
ES 411 Soil Testing and Interpretation (3)  
Electives (3 hrs)Upper-division courses as approved by department advisor

**Forestry Concentration (33 hrs)**

ES 102 Overview of Forest Measurement (3)  
ES/FOR 101 Introduction to Forestry (3)  
FOR 113 Dendrology (3)  
ES 310 Mensuration and Biometrics (3)  
ES 317 Rangeland Management (3)  
ES 318 Silviculture (3)  
ES 404 Forest Health, Restoration, and Management (3)  
ES 410 Soil Testing and Interpretation (3)  
ES 411 Soil Management and Fertility (3)  
ES 414 Wildland Fire Management (3)  
Electives (3 hrs)Upper-division courses as approved by department advisor  
TOTAL CREDIT HOURS 128-129

**MATH AND  
SCIENCE**

**Associate of Applied Science**

**ENVIRONMENTAL SCIENCE**

03.0104

This program is designed to provide the technical skills which will enable you to competently gather, record, and analyze

critical environmental data and perform simple health risk assessment evaluations.

**GENERAL EDUCATION (29 hrs)**

**Communications (9 hrs)**

ENG 111 English Composition I (3)  
ENG 116 Technical Writing (3)  
SPCH 130 Public Speaking (3)

**Humanities (3 hrs)**

PHIL 220 Ethics (3)

**Math/Lab Sciences (14 hrs)**

BIOL 203 Ecology and Evolution (3)  
BIOL 203L Ecology and Evolution Lab (1)  
ES 112 Introduction to Environmental Science (3)  
ES 112L Introduction to Environmental Science Lab (1)  
MATH 145 Introduction to Probability and Statistics (3)  
MATH 150 College Algebra (3)

**Social/Behavioral Sciences (3 hrs)**

SOC 211 Small Group Communications Studies (3)

**HEALTH, PHYSICAL EDUCATION & RECREATION (1 hr)**

Electives (1)

**PROGRAM REQUIREMENTS (45 hrs)**

BIOL 210 Microbiology (3)

BIOL 210L Microbiology Lab (1)

CHEM 121 General Chemistry I (3)

CHEM 121L General Chemistry I Lab (1)

Choose **one** of the following:

ES 201 Environmental Physical and Chemical Processes (3)

ES 201L Environmental Physical and Chemical Processes Lab (1)

**or**

CHEM 122 General Chemistry II (3)

CHEM 122L General Chemistry II Lab (1)

CHEM 210 Integrated Organic &amp; Biochemistry (3)

CHEM 210L Integrated Organic &amp; Biochemistry Lab (1)

ES 121 Environmental Air Monitoring (3)

ES 125 Principles of Physical Hydrology (3)

ES 203 Introduction to GIS/GPS (3)

ES 236 Environmental Sampling and Instrumentation (3)

ES 238 Environmental Law and Regulations (3)

ES 240 Introduction to Treatment, Storage, and Disposal of Hazardous Materials (3)

ES 280 Introduction to Toxicology/ Risk Assessment (3)

RAD 234L Introduction to Radiation Science and Technology (4)

RAD 238L Introduction to Radiation Protection (4)

TOTAL CREDIT HOURS 74

**MATH AND****SCIENCE****Certificate****ENVIRONMENTAL MONITORING**

03.0105

This program provides hands-on training in environmental monitoring methods at Los Alamos National Laboratory. It is

intended for current employees of the environmental programs of the 4 ACCORD tribes (Santa Clara, San Ildefonso,

Jemez, and Cochiti). Those pursuing this specific program are exempt from Northern's minimum residency requirement.

**GENERAL EDUCATION (6 hrs)****Communications (3 hrs)**

ENG 108N Basic English I (3)

**Math/Computers/Lab Sciences (3)**

MATH 102N Basic Algebra (3)

**PROGRAM REQUIREMENTS (11 hrs)**

ES 100 Environment, Safety, Health, and Radiation (2)

ES 121 Environmental Air Monitoring (3)

ES 123 Environmental Hydrology &amp; Ecology (3)

ES 260 Environmental Radioactivity (3)

TOTAL CREDIT HOURS 17

**Associate of Applied Science**  
**NATURAL RESOURCES - RANGE ECOLOGY MANAGEMENT**

This program is designed to provide entry-level skills for employment with the national park service or with other state and federal natural resource agencies. In addition, when you complete this program, you will have obtained the necessary courses to transfer to a four-year college or university to further pursue a degree in the field of range ecology.

**GENERAL EDUCATION (47 hrs)**

**Communications (9 hrs)**

ENG 111 English Composition I (3)

ENG 116 Technical Writing (3)

SPCH 130 Public Speaking (3)

**Humanities (3 hrs)**

PHIL 220 Ethics (3)

**Math/Computer/Lab Sciences (29 hrs)**

BIOL 201 Principles of Molecular and Cell Biology (3)

BIOL 201L Principles of Molecular and Cell Biology Lab (1)

BIOL 202 Genetics (3)

BIOL 202L Genetics Lab (1)

CHEM 121 General Chemistry I (3)

CHEM 121L General Chemistry I Lab (1)

CS 102 Computer Literacy (3)

ES 112 Introduction to Environmental Science I (3)

ES 112L Introduction to Environmental Science I Lab (1)

GEOL 101 Physical Geology (3)

GEOL 101L Physical Geology Lab (1)

MATH 145 Introduction to Probability and Statistics (3)

MATH 150 College Algebra (3)

**Social/Behavioral Sciences (6 hrs)**

Elective (6)

**HEALTH, PHYSICAL EDUCATION & RECREATION (1 hr)**

Electives (1)

**PROGRAM REQUIREMENTS (20 hrs.)**

ES 134 OSHA Health/Safety (3)

ES 120 Forest and Range Ecology (3)

ES 203 Introduction to GIS/GPS and Cartography (3)

ES 210 Soil Management and Fertility (3)

ES 210L Soil Management and Fertility Lab (1)

ES 217 Rangeland Management (3)

ES 250 Watershed and Hydrology Management (3)

ES 299 Practicum in Environmental Science (1)

TOTAL CREDIT HOURS 68

**Associate of Applied Science  
PRE-FORESTRY**

This program is designed to provide entry-level skills for employment with the national park service or with other state and federal natural resource agencies. In addition, when you complete this program, you will have obtained the necessary courses to transfer to a four-year college or university to further pursue a degree in the forestry field.

**GENERAL EDUCATION (44 hrs)**

**Communications (9 hrs)**

ENG 111 English Composition I (3)

ENG 116 Technical Writing (3)

SPCH 130 Public Speaking (3)

**Humanities (3 hrs)**

PHIL 220 Ethics (3)

**Math/Computer/Lab Sciences (29 hrs)**

BIOL 201 Principles of Molecular and Cell Biology (3)

BIOL 201L Principles of Molecular and Cell Biology Lab (1)

BIOL 202 Genetics (3)

BIOL 202L Genetics Lab (1)

CHEM 121 General Chemistry I (3)

CHEM 121L General Chemistry I Lab (1)

ES 112 Introduction to Environmental Science I (3)

ES 112L Introduction to Introduction to Environmental Science I Lab (1)

GEOL 101 Physical Geology (3)

GEOL 101L Physical Geology Lab (1)

CS 102 Computer Literacy (3)

MATH 145 Introduction to Probability and Statistics (3)

MATH 150 College Algebra (3)

**Social/Behavioral Sciences (3)**

Elective (3)

**HEALTH, PHYSICAL EDUCATION & RECREATION (1 hr)**

Electives (1)

**PROGRAM REQUIREMENTS (26 hrs)**

ES/FOR 101 Introduction to Forestry (3)

ES 102 Overview of Forest Measurement (3)

ES 123 Forest and Range Ecology (3)

ES 210 Soil Management and Fertility (3)

ES 210L Soil Management and Fertility Lab (1)

ES 217 Rangeland Management (3)

ES 250 Watershed and Hydrology Management (3)

ES 299 Special Environmental Topics (1)

FOR 113 Dendrology (3)

TOTAL CREDIT HOURS 68

**Associate of Applied Science**  
**RADIATION PROTECTION**

This program is designed to prepare you for a career as a Health Protection Technician in environmental programs and scientific laboratories. The program prepares you to conduct radiation surveys, interpret survey data, assess personnel protection requirements, and instruct personnel in appropriate protective procedures and environmental clean-up.

**GENERAL EDUCATION (43 hrs)**

**Communications (6 hrs)**

ENG 111 English Composition I (3)

ENG 116 Technical Writing (3)

**Humanities (3 hrs)**

Elective (3)

**Math/Computer/Lab Sciences (32 hrs)**

BIOL 201 Principles of Molecular and Cell Biology (3)

BIOL 201L Principles of Molecular and Cell Biology Lab (1)

BIOL 202 Genetics (3)

BIOL 202L Genetics Lab (1)

CHEM 121 General Chemistry I (3)

CHEM 121L General Chemistry I Lab (1)

CHEM 122 General Chemistry II (3)

CHEM 122L General Chemistry II Lab (1)

CS 102 Computer Literacy (3)

MATH 130 Intermediate Algebra (3)

MATH 145 Introduction to Probability and Statistics (3)

MATH 150 College Algebra (3)

PHYS 121 Applied Physics I (3)

PHYS 121L Applied Physics I Lab (1)

**Social/Behavioral Sciences (3)**

Elective (3)

**HEALTH, PHYSICAL EDUCATION & RECREATION (1 hr)**

Electives (1)

**PROGRAM REQUIREMENTS (19 hrs)**

RAD 233 Radiation Biology (3)

RAD 234L Introduction to Radiation Science & Technology (4)

RAD 238L Introduction to Radiation Protection (4)

RAD 242 Problems in Radiation Protection (4)

RAD 243 Practical Radiological Programs and Sampling Methods (4)

TOTAL CREDITS 64