ENVIRONMENTAL SCIENCE AND TECHNOLOGY (BS)

Degree: Bachelor of Science
Major: Environmental Science and Technology
Program Code: 3443

We educate students in the science, protection, and restoration of our natural resources—air, water, land, and ecosystems. Students develop a foundation in biology, chemistry, mathematics, statistics, and communication skills, then apply this knowledge to the study and solution of environmental problems. We balance theory with hands-on practice, and include considerable work outdoors in our spectacular local environment. Students choose either the Pollution Monitoring & Control option, which focuses on pollution prevention as well as investigation and cleanup, or the Ecosystem Restoration option, which focuses on strategies for managing natural resources. Students complete the program with our Capstone course, in which they work in small groups on real-life projects for an off-campus client. Each group plans and implements a project and presents the final results to its client. In addition to providing students with a chance to showcase the knowledge and abilities they have acquired through their studies, students learn how to deal with the challenges of real-life project work.

Our graduates take positions as environmental professionals with consulting firms, industry, and government agencies (e.g., U.S. Bureau of Land Management, U.S. Geological Survey, and U.S. Army Corps of Engineers). Some continue their studies in graduate school (e.g., Colorado School of Mines, Colorado State University, University of Denver).

For more information on what you can do with this major, visit Career Services' What to Do with a Major? resource.

All CMU baccalaureate graduates are expected to demonstrate proficiency in specialized knowledge/applied learning, quantitative fluency, communication fluency, critical thinking, personal and social responsibility, and information literacy. In addition to these campus-wide student learning outcomes, graduates of this major will be able to:

1. Define terminology, concepts, theories, and practices in environmental science. (specialized knowledge)
2. Find information relevant to environmental science, evaluate information critically, and apply the information appropriately and effectively to specific purposes (information literacy, critical thinking).
3. Demonstrate the ability to design an environmental study. (quantitative fluency, critical thinking, applied learning)
4. Demonstrate the ability to use appropriate tools, technology, and methods for measuring and analyzing environmental data. (quantitative fluency, applied learning)
5. Demonstrate the ability to analyze quantitative environmental data, effectively translate data into graphs or tables, and interpret the results. (quantitative fluency)
6. Construct an organized argument (oral and written) supported by current research on a technical issue in environmental science appropriate for a specialized audience. (communication fluency)
7. Complete a field-based project that evaluates and proposes a logical solution for an environmental issue or need by effectively synthesizing applicable concepts from environmental science and related disciplines. (applied learning, critical thinking, personal and social responsibility)

Requirements

Each section below contains details about the requirements for this program. Select a header to expand the information/requirements for that particular section of the program's requirements.

To print or save an overview of this program's information, including the program description, learning outcomes, requirements, suggested course sequencing (if applicable), and advising and graduation information, scroll to the bottom of the left-hand navigation menu and select "Print Options." This will give you the options to either "Send Page to Printer" or "Download PDF of This Page." The "Download PDF of This Page" option prepares a much more concise presentation of all program information. The PDF is also printable and may be preferable due to its brevity.

Institutional Degree Requirements

The following institutional degree requirements apply to all CMU baccalaureate degrees. Specific programs may have different requirements that must be met in addition to institutional requirements.

- 120 semester hours minimum.
- Students must complete a minimum of 30 of the last 60 hours of credit at CMU, with at least 15 semester hours in major discipline courses numbered 300 or higher.
- 40 upper-division credits (an alternative credit limit applies to the Bachelor of Applied Science degree).
- 2.00 cumulative GPA or higher in all CMU coursework.
- A course may only be used to fulfill one requirement for each degree/certificate.
- No more than six semester hours of independent study courses can be used toward the degree.
- Non-traditional credit, such as advanced placement, credit by examination, credit for prior learning, cooperative education and internships, cannot exceed 30 semester credit hours for a baccalaureate degree. A maximum of 15 of the 30 credits may be for cooperative education, internships, and practica.
- Pre-collegiate courses (usually numbered below 100) cannot be used for graduation.
- Capstone exit assessment/projects (e.g., Major Field Achievement Test) requirements are identified under Program-Specific Degree Requirements.
- The Catalog Year determines which program sheet and degree requirements a student must fulfill in order to graduate. Visit with your advisor or academic department to determine which catalog year and program requirements you should follow.
- See "Requirements for Undergraduate Degrees and Certificates" in the catalog for a complete list of graduation requirements.

Essential Learning Requirements

(31 semester hours)

See the current catalog for a list of courses that fulfill the requirements below. If a course is an Essential Learning option and a requirement for your major, you must use it to fulfill the major requirement and make a different selection for the Essential Learning requirement.

Code	Title	Semester Credit Hours
English [1]		
ENGL 111	English Composition I-GTCO1	3
ENGL 112	English Composition II-GTCO2	3
Mathematics [1]		
MATH 113	College Algebra-GTMA1 [2,3]	3
History		
Select one History course		3
Humanities		
Select one Humanities course		3
Social and Behavioral Sciences		
Select one Social and Behavioral Sciences course		3
Select one Social and Behavioral Sciences course		3
Fine Arts		
Select one Fine Arts course		3
Natural Sciences [4]		
Select one Natural Sciences course [5]		3
Select one Natural Sciences course with a lab		4
Total Semester Credit Hours		**31**

1 Must receive a grade of "C" or better and must be complete by the time the student has 60 semester hours.

2 This is a 4 credit course. 3 credits apply to the Essential Learning requirements and 1 credit applies to elective credit.

3 Students who plan to take Calculus I-GTMA1 (MATH 151) should take Precalculus Mathematics-GTMA1 (MATH 119) or Algebra for Calculus-GTMA1 (MATH 119A) and Trigonometry for Calculus (MATH 119B) instead of College Algebra-GTMA1 (MATH 113).

4 7 semester hours, one course must include a lab.

5 Students who did not pass the CHEM 131 placement exam should take CHEM 111.

Other Lower Division Requirements

Code	Title	Semester Credit Hours
Wellness Requirement		
KINE 100	Health and Wellness	1
Select one Activity course		1
Essential Learning Capstone [1]		
ESSL 290	Maverick Milestone	3
ESSL 200	Essential Speech	1
Total Semester Credit Hours		**6**

1 Essential Learning Capstone must be taken after completion of the Essential Learning English and Mathematics requirements, and when a student has earned between 45 and 75 hours.

Foundation Courses

(12-14 semester hours, must pass all courses with a grade of “C” or higher)

Code	Title	Semester Credit Hours
CHEM 131 & 131L	General Chemistry I-GTSC1 and General Chemistry Laboratory I-GTSC1	5
Select one of the following options: [1]		4-5
CHEM 123	Introduction to Environmental Chemistry	
CHEM 132 & 132L	General Chemistry II-GTSC1 and General Chemistry Laboratory II-GTSC1	
Introduction to Environmental Science		
Select one of the following options:		3-4
Option 1:		
ENVS 104	Environmental Science: Global Sustainability	
Option 2:		
ENVS 101	Introduction to Environmental Science-GTSC2	
ENVS 105	Readings in Environmental Science	
Total Semester Credit Hours		**12-14**

1 CHEM 132/CHEM 132L is recommended for students who plan to attend graduate school.

Program Specific Degree Requirements

(54 semester hours, must pass all courses with a grade of “C” or higher)

Code	Title	Semester Credit Hours
Core Environmental Science Courses		
ENVS 204	Introduction to Ecosystem Management	3
ENVS 204L	Introduction to Ecosystem Management Laboratory	1
ENVS 221	Science and Technology of Pollution Control	3
ENVS 221L	Science and Technology of Pollution Control Laboratory	1
ENVS 331	Water Quality	3
ENVS 331L	Water Quality Laboratory	1
ENVS 377	Systems Thinking in Environmental Science	3
ENVS 492	Capstone in Environmental Science and Technology	3
STAT 200	Probability and Statistics-GTMA1	3
Select one of the following courses:		3-5
MATH 131	Applied Calculus-GTMA1	
MATH 151	Calculus I-GTMA1	
ENVS 475	Experimental Design and Statistical Analysis in Environmental Science	
Environmental Science Options		
Select one of the following options:		14-15
Option 1: Pollution Monitoring and Control (14 credits):		
ENVS 340	Applied Atmospheric Science	
ENVS 410	Environmental Regulatory Compliance	
ENVS 420	Pollution Investigation & Monitoring	
ENVS 420L	Pollution Investigation & Monitoring Laboratory	
GEOL 111	Principles of Physical Geology-GTSC1	
GEOL 111L	Principles of Physical Geology Laboratory-GTSC1	

Option 2: Ecosystem Restoration (15 credits):		
ENVS 312	Soil Science and Sustainability	
ENVS 312L	Soil Science and Sustainability Laboratory	
ENVS 455	Restoration Ecology	
ENVS 455L	Restoration Ecology Laboratory	
POLS 488	Environmental Politics and Policy	
BIOL 107	Principles of Plant Biology [1]	
BIOL 107L	Principles of Plant Biology Laboratory [1]	
Total Semester Credit Hours		**38-41**

[1] BIOL 107/BIOL 107L have BIOL 105/BIOL 105L as prerequisites. It is suggested students take BIOL 105/BIOL 105L to fulfill their Natural Sciences with Lab Essential Learning requirement or ask the BIOL 107 instructor for permission to register without these prerequisites.

Code	Title	Semester Credit Hours
Restricted Electives		
Select from the following additional ENVS or GIST courses to bring total credits for this section to 54:		12-16
ENVS 212	Environmental Health and Safety	
ENVS 301	Environmental Project Management	
ENVS 312	Soil Science and Sustainability	
ENVS 312L	Soil Science and Sustainability Laboratory	
ENVS 315	Mined Land Rehabilitation	
ENVS 321	Environmental Risk Analysis	
ENVS 337	Stream Biomonitoring	
ENVS 337L	Stream Biomonitoring Laboratory	
ENVS 340	Applied Atmospheric Science	
ENVS 350	Ecology and Management of Shrublands and Grasslands	
ENVS 350L	Ecology and Management of Shrublands and Grasslands Laboratory	
ENVS 354	Forest Ecology and Management	
ENVS 360	Fire Ecology	
ENVS 360L	Fire Ecology Laboratory	
ENVS 370	Renewable Energy	
ENVS 373	Climate Change Adaptation	
ENVS 374	Sustainable Building	
ENVS 376	Ecological Design and Technology	
ENVS 378	Permaculture Design	
ENVS 378L	Permaculture Design Laboratory	
ENVS 394	Natural Resources of the West	
ENVS 396	Topics	
ENVS 413	Environmental Fate and Transport of Contaminants	
ENVS 420	Pollution Investigation & Monitoring	
ENVS 420L	Pollution Investigation & Monitoring Laboratory	
ENVS 431	Water and Wastewater Treatment	
ENVS 433	Restoration of Aquatic Systems	
ENVS 455	Restoration Ecology	
ENVS 455L	Restoration Ecology Laboratory	
ENVS 460	Fire Management	
ENVS 460L	Fire Management Laboratory	
ENVS 475	Experimental Design and Statistical Analysis in Environmental Science	
ENVS 496	Topics	
ENVS 497	Structured Research	
GIST 332	Introduction to Geographic Information Systems	
GIST 332L	Introduction to Geographic Information Systems Laboratory	
Total Semester Credit Hours		**12-16**

General Electives

All college level courses appearing on your final transcript, not listed above that will bring your total semester hours to 120 hours. 16-17 semester hours

Code	Title	Semester Credit Hours
MATH 113	College Algebra-GTMA1	1
Select additional electives		15-16
Total Semester Credit Hours		**16-17**

Suggested Course Plan
Pollution Monitoring and Control

While the sequencing below culminates in a total of 119-122 semester credit hours, students must complete a minimum of 120 semester credit hours as required for completion of this degree, including satisfactory completion of all required courses. Plan to complete requirements with varying hour options accordingly.

First Year		
Fall Semester		**Semester Credit Hours**
ENGL 111	English Composition I-GTCO1	3
MATH 113	College Algebra-GTMA1	4
ENVS 104	Environmental Science: Global Sustainability	3
Essential Learning - Natural Science with Lab		4
KINE 100	Health and Wellness	1
	Semester Credit Hours	**15**
Spring Semester		
GEOL 111 & 111L	Principles of Physical Geology-GTSC1 and Principles of Physical Geology Laboratory-GTSC1	4
ENGL 112	English Composition II-GTCO2	3
STAT 200	Probability and Statistics-GTMA1	3
Essential Learning - Social and Behavioral Science		3
Essential Learning - Natural Science without lab (Students who did not pass the CHEM 131 placement exam should take CHEM 111)		3
	Semester Credit Hours	**16**
Second Year		
Fall Semester		
CHEM 131 & 131L	General Chemistry I-GTSC1 and General Chemistry Laboratory I-GTSC1	5
ENVS 204 & 204L	Introduction to Ecosystem Management and Introduction to Ecosystem Management Laboratory	4
Restricted Elective		1
Essential Learning - Fine Arts		3
KINA Activity		1
	Semester Credit Hours	**14**

Spring Semester		
ENVS 221 & 221L	Science and Technology of Pollution Control and Science and Technology of Pollution Control Laboratory	4
CHEM 132 & 132L or CHEM 123	General Chemistry II-GTSC1 or Introduction to Environmental Chemistry	4-5
MATH 131 or MATH 151	Applied Calculus-GTMA1 or Calculus I-GTMA1	4-5
Essential Learning - Social and Behavioral Sciences		3
	Semester Credit Hours	**15-17**
Third Year		
Fall Semester		
Restricted Electives		3
ENVS 331 & 331L	Water Quality and Water Quality Laboratory	4
Essential Learning - Humanities		3
ESSL 200	Essential Speech	1
ESSL 290	Maverick Milestone	3
	Semester Credit Hours	**14**
Spring Semester		
ENVS 340	Applied Atmospheric Science	3
ENVS 410	Environmental Regulatory Compliance	3
Restricted Electives		5
Essential Learning - History		3
	Semester Credit Hours	**14**
Fourth Year		
Fall Semester		
Restricted Electives		8
General Electives		7-8
	Semester Credit Hours	**15-16**
Spring Semester		
ENVS 377	Systems Thinking in Environmental Science	3
ENVS 492	Capstone in Environmental Science and Technology	3
ENVS 420 & 420L	Pollution Investigation & Monitoring and Pollution Investigation & Monitoring Laboratory	4
General Electives		6
	Semester Credit Hours	**16**
	Total Semester Credit Hours	**119-122**

Ecosystem Restoration

While the sequencing below culminates in a total of 119-122 semester credit hours, students must complete a minimum of 120 semester credit hours as required for completion of this degree. Plan to complete requirements with varying hour options accordingly.

First Year		
Fall Semester		**Semester Credit Hours**
ENGL 111	English Composition I-GTCO1	3
MATH 113	College Algebra-GTMA1	4
ENVS 104	Environmental Science: Global Sustainability	3
Essential Learning - Natural Science with Lab		4
KINE 100	Health and Wellness	1
	Semester Credit Hours	**15**
Spring Semester		
BIOL 107 & 107L	Principles of Plant Biology and Principles of Plant Biology Laboratory	4
ENGL 112	English Composition II-GTCO2	3
STAT 200	Probability and Statistics-GTMA1	3
Essential Learning - Social and Behavioral Science		3
Essential Learning - Natural Science without lab (Students who did not pass the CHEM 131 placement exam should take CHEM 111)		3
	Semester Credit Hours	**16**
Second Year		
Fall Semester		
CHEM 131 & 131L	General Chemistry I-GTSC1 and General Chemistry Laboratory I-GTSC1	5
ENVS 204 & 204L	Introduction to Ecosystem Management and Introduction to Ecosystem Management Laboratory	4
Restricted Elective		1
Essential Learning - Fine Arts		3
KINA Activity		1
	Semester Credit Hours	**14**
Spring Semester		
ENVS 221 & 221L	Science and Technology of Pollution Control and Science and Technology of Pollution Control Laboratory	4
CHEM 132 & 132L or CHEM 123	General Chemistry II-GTSC1 or Introduction to Environmental Chemistry	4-5
MATH 131 or MATH 151	Applied Calculus-GTMA1 or Calculus I-GTMA1	4-5
Essential Learning - Social and Behavioral Sciences		3
	Semester Credit Hours	**15-17**
Third Year		
Fall Semester		
ENVS 312 & 312L	Soil Science and Sustainability and Soil Science and Sustainability Laboratory	4
ENVS 331 & 331L	Water Quality and Water Quality Laboratory	4
Essential Learning - Humanities		3
ESSL 200	Essential Speech	1
ESSL 290	Maverick Milestone	3
	Semester Credit Hours	**15**
Spring Semester		
Restricted Electives		5
ENVS 377	Systems Thinking in Environmental Science	3
POLS 488	Environmental Politics and Policy	3
Essential Learning - History		3
	Semester Credit Hours	**14**
Fourth Year		
Fall Semester		
Restricted Electives		7
General Electives		7-8
	Semester Credit Hours	**14-15**
Spring Semester		
ENVS 492	Capstone in Environmental Science and Technology	3
ENVS 455 & 455L	Restoration Ecology and Restoration Ecology Laboratory	4
General Electives		9
	Semester Credit Hours	**16**
	Total Semester Credit Hours	**119-122**

Advising and Graduation

Advising Process and DegreeWorks

Documentation on the pages related to this program is intended for informational purposes to help determine what courses and associated requirements are needed to earn a degree. The suggested course sequencing outlines how students could finish degree requirements. Some courses are critical to complete in specific semesters, while others may be moved around. Meeting with an academic advisor is essential in planning courses and altering the suggested course sequencing. It

is ultimately the student's responsibility to understand and fulfill the requirements for their intended degree(s).

DegreeWorks is an online degree audit tool available in MAVzone. It is the official record used by the Registrar's Office to evaluate progress towards a degree and determine eligibility for graduation. Students are responsible for reviewing their DegreeWorks audit on a regular basis and should discuss questions or concerns with their advisor or academic department head. Discrepancies in requirements should be reported to the Registrar's Office.

Graduation Process

Students must complete the following in the first two months of the semester prior to completing their degree requirements:

- Review their DegreeWorks audit and create a plan that outlines how unmet requirements will be met in the final semester.
- Meet with their advisor and modify their plan as needed. The advisor must approve the final plan.
- Submit the "Intent to Graduate" form to the Registrar's Office to officially declare the intended graduation date and commencement ceremony plans.
- Register for all needed courses and complete all requirements for each degree sought.

Submission deadlines and commencement details can be found at http://www.coloradomesa.edu/registrar/graduation.html.

If a student's petition for graduation is denied, it will be their responsibility to consult the Registrar's Office regarding next steps.