

Environmental Science

Charles A. Dana Professor Richard K. Dunn (Chair); Associate Professor G. Christopher Koteas; Assistant Professor Laurie D. Grigg; Lecturer John Gartner; Research Associate George E. Springston

This major is interdisciplinary, designed for those with environmental interests and career goals. The program emphasizes experiential learning, commonly through field studies and outdoor education. Courses include real projects and original research participation. Students begin their curriculum with the development of a firm base in the sciences and mathematics. Each student develops an area of specialization by selecting a Concentration from one of two Options. Option I Concentrations lead to a heavier emphasis in science and engineering, and include Environmental Biology, Environmental Geology, Environmental Engineering, Environmental Chemistry, and Climate Science. Option II Concentrations result in a stronger emphasis in the social sciences, humanities, business, and include Environmental Policy & Management, Environmental Law & Protection, Environmental Writing, Green Design, and Environmental Education.

All Environmental Science majors take a pair of capstone courses involving an original research project and a seminar designed to synthesize their education and tie scientific thought to issues in society. The Department houses a number of instruments for environmental monitoring and analysis, and students also have access to resources in their area of Concentration.

Goals:

- To provide an interdisciplinary Liberal Arts degree program in Environmental Science having a strong foundation in the physical and life sciences with a focus on relationships connecting society and nature.

- To provide two options, one with a concentration in the sciences and engineering, and the other with a concentration in the social sciences and humanities.
- To provide instruction and experiences with emphasis on field studies, solution of active problems, and communication in a professional format.

Outcomes:

- Understand the physical laws of nature that control the formation and evolution of Earth materials and biological organisms
- Understand what controls the behavior of the chemical compounds that make up the inorganic and organic materials of the Earth
- Know how to define a problem, design a study to acquire data, critically analyze and interpret data, and discuss the implications of results
- Be able to think critically about published work, synthesize the content of such work, and present findings at a professional level both in writing and orally
- Meet the University's General Education Goals

Careers for this Major:

- Graduate education
- Industry and consulting
- Military
- Environmental agencies
- Non-profit organizations

Environmental Science Major-Scientific Foundations Conc.

Environmental Science (B.S.) Scientific Foundations Conc. – Curriculum Map 2020-2021 Catalog

Course	Cr. Comp.	Course	Cr. Comp.
FRESHMAN			
Fall		Spring	
GL 110 Introduction to Geology (General Education Lab Science)	4	GL 111 Oceanography (General Education Lab Science)	4
BI 101 Principles of Biology I	4	BI 102 Principles of Biology II	4
MA 107 Precalculus Mathematics (General Education Math)	4	MA 108 Applied Calculus (General Education Math)	4
EN 101 Composition and Literature I	3	EN 102 Composition and Literature II	3
Fall Semester Total Cr.:	15	Spring Semester Total Cr.:	15
SOPHOMORE			
Fall		Spring	
ES 251 Sophomore Seminar in Environmental Science	1	ES 115 Geographic Information Systems	3
CH 103 General Chemistry I	4	CH 104 General Chemistry II	4
PH 323 Environmental Ethics (General Education Ethics) or ES 130 Introduction to Environmental Law	3	MA 232 Elementary Statistics	3
ES/GL/CE Elective ^{1,3}	3-4	Technical Elective ^{2,3}	3-4
Free Elective ³	3	General Education Arts & Humanities (http://catalog.norwich.edu/archives/2020-2021/residentialprograms/catalog/generaleducationgoals/)	3
Fall Semester Total Cr.:	14-15	Spring Semester Total Cr.:	16-17

JUNIOR			
Fall		Spring	
ES 130 Introduction to Environmental Law or PH 323 Environmental Ethics	3	ES 340 Project Development in Environmental Science	1
GL Elective ⁴	4	ES 2XX ³	3-4
PS 201 General Physics I	4	ES/GL/CE Elective or GL 255 ^{1,3}	4
EC 201 Principles of Economics (Macro) (General Education Social Science) or 202 Principles of Economics (Micro)	3	PS 202 General Physics II	4
General Education Literature (http://catalog.norwich.edu/archives/2020-2021/residentialprogramscatalog/generaleducationgoals/)	3	Free Elective ³	3
Fall Semester Total Cr.:	17	Spring Semester Total Cr.:	15-16
SENIOR			
Fall		Spring	
ES 440 Research Project in Environmental Science (Capstone)	3	ES 451 Environmental Science Seminar	3
BI 205 Ecology	4	ES 460 Project Completion in Environmental Science	1
Technical Elective ^{2,3}	3-4	GL 255 Hydrogeology	3
General Education Leadership (http://catalog.norwich.edu/archives/2020-2021/residentialprogramscatalog/generaleducationgoals/)	1-3	General Education History (http://catalog.norwich.edu/archives/2020-2021/residentialprogramscatalog/generaleducationgoals/)	3
Free Elective ³	4	Free Elective ³	3
Fall Semester Total Cr.:	15-18	Spring Semester Total Cr.:	13
TOTAL CREDITS FOR THIS MAJOR: 120-126			

- Any 200-level, or higher course in ES, GL, CE.
- Technical Electives include courses in BI, CE, CH, CS 140 or 200-level or higher, EE, EG, EM, ES, GL, MA (108 or higher), ME, PS.
- Course options may have varying credits to select from with course offerings. The degree requires no less than 120 credits; therefore, ensure degree plans account for no less than 120 credits.
- Geology elective must be taken from the following: GL 253 (<http://catalog.norwich.edu/archives/2020-2021/search/?P=GL%20253>), GL 255 (<http://catalog.norwich.edu/archives/2020-2021/search/?P=GL%20255>), GL 257 (<http://catalog.norwich.edu/archives/2020-2021/search/?P=GL%20257>), GL 258 (<http://catalog.norwich.edu/archives/2020-2021/search/?P=GL%20258>), GL 261 (<http://catalog.norwich.edu/archives/2020-2021/search/?P=GL%20261>), GL 262 (<http://catalog.norwich.edu/archives/2020-2021/search/?P=GL%20262>), GL 263 (<http://catalog.norwich.edu/archives/2020-2021/search/?P=GL%20263>), GL 264 (<http://catalog.norwich.edu/archives/2020-2021/search/?P=GL%20264>).

Environmental Science Major-Social/Cultural Foundations Conc.

Environmental Science (B.S.) Social/Cultural Conc. – Curriculum Map 2020-2021 Catalog

Course	Cr. Comp.	Course	Cr. Comp.
FRESHMAN			
Fall		Spring	
GL 110 Introduction to Geology (General Education Lab Science)	4	GL 111 Oceanography (General Education Lab Science)	4
BI 101 Principles of Biology I	4	BI 102 Principles of Biology II	4
MA 107 Precalculus Mathematics (General Education Math)	4	MA 108 Applied Calculus (General Education Math)	4
EN 101 Composition and Literature I	3	EN 102 Composition and Literature II	3
Fall Semester Total Cr.:	15	Spring Semester Total Cr.:	15
SOPHOMORE			
Fall		Spring	
ES 251 Sophomore Seminar in Environmental Science	1	ES 115 Geographic Information Systems	3

GL 253 Geomorphology (or Technical Elective) ¹	4	MA 232 Elementary Statistics	3
EN 276 Environmental Writing	3	Social Science 100-200 Level ²	3
PH 323 Environmental Ethics (General Education Ethics)	3	Social Science 100-200 Level ²	3
Social Science 100-200 Level ²	3	Free Elective	3
Free Elective ⁴	3		
Fall Semester Total Cr.:	17	Spring Semester Total Cr.:	15
JUNIOR			
Fall		Spring	
ES 130 Introduction to Environmental Law	3	ES 340 Project Development in Environmental Science	1
Technical Elective ¹	3-4	ES Elective	3
General Education Literature	3	Social Science 300-400 Level ³	3
Social Science 100-200 Level ²	3	General Education History (http://catalog.norwich.edu/archives/2020-2021/residentialprograms/catalog/generaleducationgoals/)	3
Social Science 300-400 Level ³	3	Chemistry (CH) Elective	4
		Free Elective ⁴	3-4
Fall Semester Total Cr.:	15-16	Spring Semester Total Cr.:	17-18
SENIOR			
Fall		Spring	
ES 440 Research Project in Environmental Science (Capstone)	3	ES 451 Environmental Science Seminar	3
BI 205 Ecology	4	ES 460 Project Completion in Environmental Science	1
ES Elective	3	Social Science 300-400 Level ³	3
General Education Arts & Humanities OR PH 323 (http://catalog.norwich.edu/archives/2020-2021/residentialprograms/catalog/generaleducationgoals/)	3	General Education Leadership (http://catalog.norwich.edu/archives/2020-2021/residentialprograms/catalog/generaleducationgoals/)	1-3
Social Science 300-400 Level ³	3	Free Elective	3
		Free Elective	3
Fall Semester Total Cr.:	16	Spring Semester Total Cr.:	14-16
TOTAL CREDITS FOR THIS MAJOR: 124-128			

- ¹ Technical Electives include courses in BI, CE, CH, CS 140 or 200-level or higher, EE, EG, EM, ES, GL, MA (108 or higher), ME, PS.
- ² One, 100-200-level course from PO or SO; one 100-200-level course from CJ or PY; one 100-200-level course from MG or EC. One 100-200-level course from, from PO, SO, CJ, PY, MG, or EC.
- ³ 300-400-level course from CJ, EC, MG, PO, PY, SO.
- ⁴ Course options may have varying credits to select from with course offerings. The degree requires no less than 120 credits; therefore, ensure degree plans account for no less than 120 credits.