

## ENVIRONMENTAL SCIENCES B.S.

All students must meet the University Requirements. ([http://catalogue.uvm.edu/undergraduate/academicinfo/degree\\_requirements/](http://catalogue.uvm.edu/undergraduate/academicinfo/degree_requirements/))

All students must meet the College Requirements. ([http://catalogue.uvm.edu/undergraduate/agricultureandlifesciences/#requirements\\_text](http://catalogue.uvm.edu/undergraduate/agricultureandlifesciences/#requirements_text))

### MAJOR REQUIREMENTS

Environmental Sciences majors through the College of Agriculture and Life Sciences must fulfill the following requirements for graduation:

General CALS distribution requirements		
Core distribution requirements for the major (which also fill CALS distribution requirements):		17
CDAE 002	D2:SU:World Food,Pop & Develop	
CDAE 208	Agricultural Policy and Ethics	
PSS 010	Home & Garden Horticulture	
or PSS 021	SU: Intro to Agroecology	
BCOR 102	SU:Ecology and Evolution	
MMG 101	Microbiol & Infectious Disease	
or PSS 106	Entomology & Pest Mgmt	
Environmental Science minimal basic science/quantitative courses (which also fill college core requirements):		34
BCOR 011	Exploring Biology	
or BIOL 001	Principles of Biology	
BCOR 012	Exploring Biology	
or BIOL 002	Principles of Biology	
PSS 161	SU: Fundmntls of Soil Science	
or GEOL 055	Environmental Geology	
(PSS 161 is required for many PSS courses in several curricular concentrations; most students should take this course.)		
MATH 019	QR: Fundamentals of Calculus I	
or MATH 021	QR: Calculus I	
MATH 020	QR: Fundamentals of Calculus II	
or MATH 022	QR: Calculus II	
NR 140	Applied Environ Statistics	
or STAT 141	QR: Basic Statistical Methods 1	
CHEM 031	General Chemistry 1	

CHEM 032	General Chemistry 2	
CHEM 042	Intro Organic Chemistry	
or CHEM 141	Organic Chemistry 1	
Students should consider taking the following course sequence:		
CHEM 141 & CHEM 142	Organic Chemistry 1 and Organic Chemistry 2	
Environmental Sciences foundation courses:		18
ENSC 001	SU: Intro Environmental Sci	
ENSC 130	Global Environmental Assessmnt	
ENSC 160	Pollutant Mvmt/Air, Land&Water	
ENSC 201	Recovery&Restor Altered Ecosys	
ENSC 202	Applied Envir Assess Analysis	
Concentration requirement: fourteen to seventeen credits in one of the following Focus Areas:		14-17
Agriculture and the Environment		
Conservation Biology and Biodiversity		
Ecological Design		
Environmental Analysis and Assessment		
Environmental Biology		
Environmental Geology		
Environmental Health		
Global Environmental and Climate Change		
Water Resources		
Students may elect to petition to develop a Self-Designed curriculum track.		

### CONCENTRATION REQUIREMENTS

#### Agriculture and the Environment Concentration

PSS 162	Soil Fertility & Conservation	3
Choose a minimum of 11 additional credits from the following courses:		
PBIO 109	Plant Systematics	
MMG 220	Environmental Microbiology	
PSS 106	Entomology & Pest Mgmt	
PSS 112	Weed Ecology & Management	
PSS 117	Plant Pathology	
PSS 143	Forage and Pasture Mgmt	
PSS 156	Permaculture	

PSS 232	Biological Control	
ENSC 195	Internship	
ENSC 196	Undergraduate Research	
PSS 212	SU: Advanced Agroecology	
PSS 261	Soil Morph Class & Land Use	
PSS 264	Chemistry of Soil & Water	
PSS 268	Soil Ecology	
PSS 269	Soil/Water Pollution/Bioremed	
A maximum of 3 credits of ENSC 195 or ENSC 196 may apply toward the 11 elective credits with advisor approval.		

**Conservation Biology and Biodiversity Concentration**

WFB 224	Conservation Biology	4
Choose ONLY one of the following:		
PBIO 109	Plant Systematics	
FOR 021	Dendrology	
WFB 130	Ornithology	
WFB 232	Ichthyology	
Choose a minimum of 6-7 additional credits from the following courses:		
ASCI 171	Zoos, Exotics & Endang Species	
BCOR 101	Genetics	
BCOR 102	SU:Ecology and Evolution	
PBIO 108	Morph & Evo of Vascular Plants	
FOR 122	Forest Ecosystem Analysis	
ENSC 195	Internship	
ENSC 196	Undergraduate Research	
BIOL 254	Population Genetics	
BIOL 264	Community Ecology	
FOR 272	Sustain Mgmt Forest Ecosys	
FOR/NR 228	Ecosystems Ecology	
NR 220	Landscape Ecology	
PSS 268	Soil Ecology	
WFB 161	Fisheries Biology & Techniques	
WFB 174	Prin of Wildlife Management	
WFB 261	Fisheries Management	
WFB 283	Terrestrial Wildlife Ecology	

WFB 275	Wildlife Behavior	
A maximum of 3 credits of ENSC 195 or ENSC 196 may apply toward the 10 elective credits with advisor approval.		

**Ecological Design Concentration**

NR 288	Ecol Design & Living Technol	3
Choose a minimum of 11 additional credits from the following courses:		
CDAE 102	Sustainable Community Dev	
CDAE 170	Green Building Energy Systems	
CDAE 191	Independent Study	
CDAE 237	Economics of Sustainability	
CDAE 267	Strat Plan:Comm Entrepreneurs	
CE 132	SU: Environmental Systems	
CE 151	SU: Water & Wastewater Engr	
ENVS 188	SU:Sustainability Science	
ENSC 195	Internship	
ENSC 196	Undergraduate Research	
MMG 220	Environmental Microbiology	
NR 289	Advanced Ecological Design	
PSS 127	Greenhouse Operations & Mgmt	
PSS 137	Landscape Design Fundamentals	
PSS 162	Soil Fertility & Conservation	
PSS 238	Ecological Landscape Design	
PSS 154	Composting Ecology & Mgmt	
PSS 156	Permaculture	
PSS 212	SU: Advanced Agroecology	
PSS 268	Soil Ecology	
PSS 269	Soil/Water Pollution/Bioremed	
PRT 230	Ecotourism	
A maximum of 3 credits of ENSC 195 or ENSC 196 may apply toward the 11 elective credits with advisor approval.		

**Environmental Analysis and Assessment Concentration**

Choose a minimum of 14 credits from the following courses:		
CHEM 121	Quantitative Analysis	
PBIO 223	Fundamentals of Field Science	
CE 132	SU: Environmental Systems	

CE 151	SU: Water & Wastewater Engr	
CE 254	Environmental Quantitative Anyl	
CHEM 131	Inorganic Chemistry	
CHEM 165	Intro Physical Chemistry	
CHEM 221	Instrumental Analysis	
FOR/NR 146/ GEOG 185	Remote Sensing of Natural Res	
ENSC 195	Internship	
ENSC 196	Undergraduate Research	
GEOL 235	Geochemistry of Natural Waters	
MMG 220	Environmental Microbiology	
NR 143	Intro to Geog Info Systems	
or NR 243	GIS Practicum	
PSS 261	Soil Morph Class & Land Use	
PSS 264	Chemistry of Soil & Water	
A maximum of 3 credits of ENSC 195 or ENSC 196 may apply toward the 14 elective credits with advisor approval.		

**Environmental Biology Concentration**

BCOR 102	SU:Ecology and Evolution	4
Choose a minimum of 12 additional credits from the following courses:		
BIOL 209	Field Zoology of Arthropods	
BIOL 217	Mammalogy	
BIOL 254	Population Genetics	
BIOL 264	Community Ecology	
BIOL 269	Plant-Animal Interactions	
BIOL 271	Evolution	
BIOL 276	Behavioral Ecology	
NR 250	Limnology	
or NR 280	Stream Ecology	
PSS 268	Soil Ecology	
ENSC 195	Internship	
ENSC 196	Undergraduate Research	
A maximum of 3 credits of ENSC 195 or ENSC 196 may apply toward the 12 elective credits with advisor approval.		

**Environmental Geology Concentration**

Choose a minimum of 14 credits from the following courses:		
GEOL 101	Field Geology	
GEOL 116	Glacial Geology	
GEOL 135	Environmental Geochemistry	
GEOL 151	Geomorphology	
or GEOG 144	Geomorphology	
GEOL 201	Advanced Field Geology	
GEOL 217	Vermont Field Geology	
GEOL 234	Global Biogeochemical Cycles	
GEOL 235	Geochemistry of Natural Waters	
NR 143	Intro to Geog Info Systems	
or GEOG 184	Geog Info:Cncpts & Applic	
ENSC 195	Internship	
ENSC 196	Undergraduate Research	
A maximum of 3 credits of ENSC 195 or ENSC 196 may apply toward the 14 elective credits with advisor approval.		

**Environmental Health Concentration**

NR/ENVS/ HLTH 107	SU:Human Health & the Envirnmnt	3
Choose a minimum of 11 additional credits from the following courses:		
ANTH 288	Anthro Research Global Health	
BCOR 101	Genetics	
BIOC 201	Fundamentals of Biochemistry	
BIOC 275	Adv Biochem of Human Disease	
BIOL 261	Neurobiology	
CHEM 142	Organic Chemistry 2	
ENSC 195	Internship	
ENSC 196	Undergraduate Research	
ENVS 195	Special Topics (When topic is Emerging Technologies and Human Health)	
MMG 101	Microbiol & Infectious Disease	
NFS 114	Human Health in the Food Syst	
NR 143	Intro to Geog Info Systems	
NURS 200	SU: Health and Sustainability	
PH 304	Environmental Public Health	

PH 308	Environmental Public Health 2	
PHRM 201	Introduction to Pharmacology	
PHRM 240	Molecules & Medicine	
PHRM 272	Toxicology	
STAT 200	QR: Med Biostat&Epidemiology	
A maximum of 3 credits of ENSC 195 or ENSC 196 may apply toward the 11 elective credits with advisor approval.		

**Global Environment and Climate Change Concentration**

FOR/NR 146/ GEOG 185	Remote Sensing of Natural Res	3
or NR 143	Intro to Geog Info Systems	
Choose a minimum of 11 additional credits from the following courses:		
CE 132	SU: Environmental Systems	
ENSC 195	Internship	
ENSC 196	Undergraduate Research	
ENSC 274	SU:Climate Chg: Sci & Percept	
GEOG 140	Biogeography	
GEOG 143	Climatology: Concepts & Tools	
GEOG 148	Global Environmental Change	
GEOG 153	The Circumpolar Arctic	
GEOG 244	Adv Top: Global Change	
GEOG 245	Adv Top:Human Env Interactions (The Anthropocene)	
GEOG 246	Adv Top:Climate&Water Resource (Climatology and Natural Hazards)	
GEOG 246	Adv Top:Climate&Water Resource (Paleoclimatology)	
GEOL 151/ GEOG 144	Geomorphology	
GEOL 234	Global Biogeochemical Cycles	
NR 102	SU:Water as a Natural Resource	
or GEOG 145	SU: Geography of Water	
NR 220	Landscape Ecology	
PSS 261	Soil Morph Class & Land Use	
A maximum of 3 credits of ENSC 195 or ENSC 196 may apply toward the 11 elective credits with advisor approval.		

**Water Resources Concentration**

Choose a minimum of 14 credits from the following courses:		
ENSC 195	Internship	
ENSC 196	Undergraduate Research	
GEOG 246	Adv Top:Climate&Water Resource (Snow Hydrology)	
GEOL 135	Environmental Geochemistry	
GEOL 235	Geochemistry of Natural Waters	
NR 102	SU:Water as a Natural Resource	
or GEOG 145	SU: Geography of Water	
NR 143	Intro to Geog Info Systems	
NR 250	Limnology	
NR 280	Stream Ecology	
PSS 269	Soil/Water Pollution/Bioremed	
WFB 161	Fisheries Biology & Techniques	
A maximum of 3 credits of ENSC 195 or ENSC 196 may apply toward the 14 elective credits with advisor approval.		