ENVIRONMENTAL SCIENCES, B.S. (L&S)

The environmental sciences major satisfies the growing demand among entry-level students for a rigorous, science-based program that promotes critical thinking and emphasizes environmental problem solving in service to society. The program is designed to prepare graduates who will be highly competitive for entry-level positions in nonprofit and private sectors, and for master’s programs and doctoral research programs in environmental fields. Possible career paths include environmental monitoring, consulting, education, research, and planning, as well as natural resource management, ecology restoration, remediation, water and air quality assessment, sustainability practices, and more. Undergraduates in environmental sciences prepare for a variety of career and graduate school opportunities that require a strong background in the natural sciences. Foundational course work in the major includes calculus, biology, chemistry, and physics. Core and elective course work is fulfilled through diverse offerings from both the College of Agricultural and Life Sciences, and the College of Letters & Science.

The environmental sciences major can be earned in either the College of Agricultural and Life Sciences (CALS) or the College of Letters & Science (L&S) under the bachelor of science (B.S.) or bachelor of arts (B.A.) degree program. An undergraduate B.S. degree is offered through both colleges. A B.A. option is offered through L&S only. Students are encouraged to review the degree requirements for both L&S and CALS and choose the college from which they would prefer to earn their degree; students may choose only one degree “home.”

- In CALS, the major is housed administratively in the Department of Soil Science.
- In L&S, the major is housed administratively in the Department of Atmospheric and Oceanic Sciences.

The major can be taken as a stand-alone or as a double major with a variety of other majors on campus including environmental studies, life sciences communication, agronomy, soil science, landscape architecture, foreign language/culture, and a number of other disciplines.

HOW TO GET IN

Students wishing to declare the environmental sciences major should meet with an academic advisor. Contact information for advisors can be found here (http://envirosci.wisc.edu/advising).

CALS undergraduate students interested in pursuing the environmental sciences major in the College of Agricultural and Life Sciences should contact Kathryn Jones, kjones26@wisc.edu or 608-807-7391.

L&S undergraduate students interested in pursuing the environmental sciences major in the College of Letters & Science should contact Eric Schueffner, elschueffner@wisc.edu or 608-890-3231.

REQUIREMENTS

UNIVERSITY GENERAL EDUCATION REQUIREMENTS

All undergraduate students at the University of Wisconsin–Madison are required to fulfill a minimum set of common university general education requirements to ensure that every graduate acquires the essential core of an undergraduate education. This core establishes a foundation for living a productive life, being a citizen of the world, appreciating aesthetic values, and engaging in lifelong learning in a continually changing world. Various schools and colleges will have requirements in addition to the requirements listed below. Consult your advisor for assistance, as needed. For additional information, see the university Undergraduate General Education Requirements (http://guide.wisc.edu/undergraduate/#requirementsforundergraduatetext) section of the Guide.

<table>
<thead>
<tr>
<th>General Education</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Breadth—Humanities/Literature/Arts: 6 credits</td>
</tr>
<tr>
<td></td>
<td>• Breadth—Natural Science: 4 to 6 credits, consisting of one 4- or 5-credit course with a laboratory component; or two courses providing a total of 6 credits</td>
</tr>
<tr>
<td></td>
<td>• Breadth—Social Studies: 3 credits</td>
</tr>
<tr>
<td></td>
<td>• Communication Part A &amp; Part B *</td>
</tr>
<tr>
<td></td>
<td>• Ethnic Studies *</td>
</tr>
<tr>
<td></td>
<td>• Quantitative Reasoning Part A &amp; Part B *</td>
</tr>
<tr>
<td>* The mortarboard symbol appears before the title of any course that fulfills one of the Communication Part A or Part B, Ethnic Studies, or Quantitative Reasoning Part A or Part B requirements.</td>
<td></td>
</tr>
</tbody>
</table>

COLLEGE OF LETTERS & SCIENCE BREADTH AND DEGREE REQUIREMENTS: BACHELOR OF SCIENCE (B.S.)

Students pursuing a bachelor of science degree in the College of Letters & Science must complete all of the requirements below. The College of Letters & Science allows this major to be paired with either a bachelor of arts or a bachelor of science curriculum. View a comparison of the degree requirements here. (https://pubs.wisc.edu/home/archives/ug15/images/babs2009.pdf)

<table>
<thead>
<tr>
<th>BACHELOR OF SCIENCE DEGREE REQUIREMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics</td>
</tr>
<tr>
<td>Two (2) 3+ credits of intermediate/advanced level MATH, COMP SCI, STAT</td>
</tr>
<tr>
<td>Limit one each: COMP SCI, STAT</td>
</tr>
<tr>
<td>Foreign Language</td>
</tr>
<tr>
<td>Complete the third unit of a foreign language</td>
</tr>
<tr>
<td>Note: A unit is one year of high school work or one semester/term of college work.</td>
</tr>
<tr>
<td>L&amp;S Breadth</td>
</tr>
<tr>
<td>• Humanities, 12 credits: 6 of the 12 credits must be in literature</td>
</tr>
<tr>
<td>• Social Sciences, 12 credits</td>
</tr>
<tr>
<td>• Natural Sciences, 12 credits: must include 6 credits in biological science; and must include 6 credits in physical science</td>
</tr>
</tbody>
</table>
Liberal Arts and Science Coursework 108 credits

Depth of Intermediate/Advanced work 60 intermediate or advanced credits

Major Declare and complete at least one (1) major

Total Credits 120 credits

UW-Madison Experience 30 credits in residence, overall

Minimum GPA 2.000 in all coursework at UW–Madison

NON–L&S STUDENTS PURSUING AN L&S MAJOR
Non–L&S students who have permission from their school/college to pursue an additional major within L&S only need to fulfill the major requirements and do not need to complete the L&S breadth and degree requirements above. Please note that the following special degree programs are not considered majors so are not available to non-L&S-degree-seeking candidates:

• Applied Mathematics, Engineering and Physics (Bachelor of Science–Applied Mathematics, Engineering and Physics)
• Journalism (Bachelor of Arts–Journalism; Bachelor of Science–Journalism)
• Music (Bachelor of Music)
• Social Work (Bachelor of Social Work)

REQUIREMENTS FOR THE MAJOR

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 221</td>
<td>Calculus and Analytic Geometry I (Recommended)</td>
<td>5-10</td>
</tr>
<tr>
<td>MATH 171 &amp; MATH 217</td>
<td>Calculus with Algebra and Trigonometry I and Calculus with Algebra and Trigonometry II</td>
<td></td>
</tr>
<tr>
<td>MATH 211</td>
<td>Calculus</td>
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</table>

Select one of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>STAT 302</td>
<td>Accelerated Introduction to Statistical Methods</td>
<td>3</td>
</tr>
<tr>
<td>STAT/MATH 309</td>
<td>Introduction to Probability and Mathematical Statistics I</td>
<td></td>
</tr>
<tr>
<td>STAT 311</td>
<td>Introduction to Theory and Methods of Mathematical Statistics I</td>
<td></td>
</tr>
<tr>
<td>STAT 371</td>
<td>Introductory Applied Statistics for the Life Sciences</td>
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Total Credits 61-80

CHEMISTRY

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<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CHEM 103</td>
<td>General Chemistry I</td>
<td>5-9</td>
</tr>
<tr>
<td>&amp; CHEM 104 or CHEM 109</td>
<td>and General Chemistry II</td>
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Select one of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CHEM 341</td>
<td>Elementary Organic Chemistry</td>
<td></td>
</tr>
<tr>
<td>CHEM 343</td>
<td>Introductory Organic Chemistry</td>
<td></td>
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<tr>
<td>CHEM 561</td>
<td>Physical Chemistry</td>
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</tbody>
</table>

Total Credits 8-12

BIOLOGY

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<tr>
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<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>BIOLOGY/BOTANY/ZOOLOGY 151 &amp; BIOLOGY/BOTANY/ZOOLOGY 152</td>
<td>Evolution, Ecology, and Genetics and Evolution, Ecology, and Genetics Laboratory</td>
<td></td>
</tr>
<tr>
<td>BOTANY/BIOLOGY 130 &amp; ZOOLOGY/BIOLOGY 101 &amp; ZOOLOGY/BIOLOGY 102</td>
<td>General Botany and Animal Biology Laboratory</td>
<td></td>
</tr>
<tr>
<td>BIOCORE 381 &amp; BIOCORE 382 &amp; BIOCORE 383 &amp; BIOCORE 384</td>
<td>Evolution, Ecology, and Genetics and Evolution, Ecology, and Genetics Laboratory</td>
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</tbody>
</table>

Total Credits 10

MATHEMATICS AND STATISTICS

This major requires calculus. Prerequisites may need to be taken before enrollment in calculus. Refer to the Course Guide for information about calculus prerequisites.

PHYSICS

<table>
<thead>
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<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>PHYSICS 207 &amp; PHYSICS 208</td>
<td>General Physics and General Physics (Recommended)</td>
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</tr>
<tr>
<td>PHYSICS 103 &amp; PHYSICS 104</td>
<td>General Physics and General Physics</td>
<td></td>
</tr>
<tr>
<td>PHYSICS 201 &amp; PHYSICS 202</td>
<td>General Physics and General Physics</td>
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</tr>
</tbody>
</table>

Total Credits 8-10
# MAJOR FOUNDATION

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ENVIR ST/ILS</td>
<td>Principles of Environmental Science</td>
<td>3-5</td>
</tr>
<tr>
<td>ENVIR ST/</td>
<td>Physical Systems of the Environment</td>
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</tr>
<tr>
<td>GEOG 127</td>
<td></td>
<td></td>
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<tr>
<td>GEOG/ENVIR ST</td>
<td>Introduction to the Earth System</td>
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</tr>
<tr>
<td>ENVIR ST 120</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GEOSCI/ENVIR ST 106</td>
<td>Environmental Geology</td>
<td></td>
</tr>
<tr>
<td>SOIL SCI/ENVIR ST/GEOG 230</td>
<td>Soil: Ecosystem and Resource</td>
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</table>

Total Credits: 3-5

# MAJOR CORE

Select at least 3 credits from each of the following subsets:

## Ecology

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>AGRONOMY 300</td>
<td>Cropping Systems</td>
<td>3</td>
</tr>
<tr>
<td>AGRONOMY/BOTANY/SOIL SCI 370</td>
<td>Grassland Ecology</td>
<td>3</td>
</tr>
<tr>
<td>BOTANY/F&amp;W ECOL 455</td>
<td>The Vegetation of Wisconsin</td>
<td>4</td>
</tr>
<tr>
<td>BOTANY/F&amp;W ECOL/ZOLOGY 460</td>
<td>General Ecology (Recommended)</td>
<td>4</td>
</tr>
<tr>
<td>ENTOM 450</td>
<td>Basic and Applied Insect Ecology</td>
<td>3</td>
</tr>
<tr>
<td>ENTOM 451</td>
<td>Basic and Applied Insect Ecology Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>ENTOM/BOTANY/ZOLOGY 473</td>
<td>Plant-Insect Interactions</td>
<td>3</td>
</tr>
<tr>
<td>ENVIR ST/ZOLOGY 510</td>
<td>Ecology of Fishes</td>
<td>3</td>
</tr>
<tr>
<td>ENVIR ST/ZOLOGY 511</td>
<td>Ecology of Fishes Lab</td>
<td>2</td>
</tr>
<tr>
<td>F&amp;W ECOL/ENVIR ST/ZOLOGY 360</td>
<td>Extinction of Species</td>
<td>3</td>
</tr>
<tr>
<td>F&amp;W ECOL 410</td>
<td>Principles of Silviculture</td>
<td>3</td>
</tr>
<tr>
<td>F&amp;W ECOL 550</td>
<td>Forest Ecology</td>
<td>3</td>
</tr>
<tr>
<td>F&amp;W ECOL 551</td>
<td>Forest Ecology Lab</td>
<td>1</td>
</tr>
<tr>
<td>F&amp;W ECOL/LAND ARC/ZOLOGY 565</td>
<td>Principles of Landscape Ecology</td>
<td>2</td>
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<tr>
<td>HORT 334</td>
<td>Greenhouse Cultivation</td>
<td>2</td>
</tr>
<tr>
<td>HORT 335</td>
<td>Greenhouse Cultivation Lab</td>
<td>1</td>
</tr>
<tr>
<td>LAND ARC/ENVIR ST 361</td>
<td>Wetlands Ecology</td>
<td>3</td>
</tr>
<tr>
<td>ZOOLOGY/ENVIR ST 315</td>
<td>Limnology-Conservation of Aquatic Resources</td>
<td>2</td>
</tr>
<tr>
<td>ZOOLOGY 316</td>
<td>Laboratory for Limnology-Conservation of Aquatic Resources</td>
<td>2-3</td>
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</table>

## Physical Environment

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ATM OCN 310</td>
<td>Dynamics of the Atmosphere and Ocean I</td>
<td>3</td>
</tr>
<tr>
<td>ATM OCN/GEOG 323</td>
<td>Science of Climate Change</td>
<td>3</td>
</tr>
<tr>
<td>ATM OCN/ENVIR ST/GEOG/GEOSCI 335</td>
<td>Climatic Environments of the Past</td>
<td>3</td>
</tr>
<tr>
<td>ATM OCN/ENVIR ST 520</td>
<td>Bioclimatology</td>
<td>3</td>
</tr>
<tr>
<td>ATM OCN/ENVIR ST 535</td>
<td>Atmospheric Dispersion and Air Pollution</td>
<td>3</td>
</tr>
<tr>
<td>BSE 365</td>
<td>Measurements and Instrumentation for Biological Systems</td>
<td>3</td>
</tr>
<tr>
<td>BSE/ENVIR ST 367</td>
<td>Renewable Energy Systems</td>
<td>3</td>
</tr>
<tr>
<td>BSE 460</td>
<td>Biorefining: Energy and Products from Renewable Resources</td>
<td>3</td>
</tr>
<tr>
<td>CIV ENGR 310</td>
<td>Fluid Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>CIV ENGR 320</td>
<td>Environmental Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CIV ENGR 423</td>
<td>Air Pollution Effects, Measurement and Control</td>
<td>3</td>
</tr>
<tr>
<td>CIV ENGR 424</td>
<td>Environmental Engineering Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>ENVIR ST/POP HLTH 502</td>
<td>Air Pollution and Human Health</td>
<td>3</td>
</tr>
<tr>
<td>GEOG/GEOSCI 320</td>
<td>Geomorphology</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 321</td>
<td>Climatology</td>
<td>3</td>
</tr>
<tr>
<td>GEOG/ENVIR ST 325</td>
<td>Analysis of the Physical Environment</td>
<td>4</td>
</tr>
<tr>
<td>GEOG 329</td>
<td>Landforms and Landscapes of North America</td>
<td>3</td>
</tr>
<tr>
<td>GEOG/ATM OCN/ENVIR ST 332</td>
<td>Global Warming: Science and Impacts</td>
<td>3</td>
</tr>
<tr>
<td>GEOG/BOTANY 338</td>
<td>Environmental Biogeography</td>
<td>3</td>
</tr>
<tr>
<td>GEOG/GEOSCI 420</td>
<td>Glacial and Pleistocene Geology</td>
<td>3</td>
</tr>
<tr>
<td>GEOG/GEOSCI 524</td>
<td>Advanced Landform Geography</td>
<td>3</td>
</tr>
<tr>
<td>GEOSCI 304</td>
<td>Geobiology</td>
<td>3</td>
</tr>
<tr>
<td>GEOSCI/GLE 627</td>
<td>Hydrogeology</td>
<td>3-4</td>
</tr>
<tr>
<td>POP HLTH/ENVIR ST 471</td>
<td>Introduction to Environmental Health</td>
<td>3</td>
</tr>
<tr>
<td>SOIL SCI 301</td>
<td>General Soil Science</td>
<td>4</td>
</tr>
<tr>
<td>SOIL SCI 321</td>
<td>Soils and Environmental Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>SOIL SCI/ENVIR ST 324</td>
<td>Soils and Environmental Quality</td>
<td>3</td>
</tr>
<tr>
<td>SOIL SCI/F&amp;W ECOL 451</td>
<td>Environmental Biogeochemistry</td>
<td>3</td>
</tr>
<tr>
<td>SOIL SCI/AGRONOMY/ATM OCN 532</td>
<td>Environmental Biophysics</td>
<td>3</td>
</tr>
<tr>
<td>SOIL SCI/CIV ENGR/M&amp;ENVTOX 631</td>
<td>Toxicants in the Environment: Sources, Distribution, Fate, &amp; Effects</td>
<td>3</td>
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</tbody>
</table>

## Geospatial Sciences

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>COMP SCI 301</td>
<td>Introduction to Data Programming</td>
<td>3</td>
</tr>
<tr>
<td>ENVIR ST/CIV ENGR/REMOTE SENSING DIGITAL IMAGE 31</td>
<td>Remote Sensing Digital Image Processing</td>
<td>3</td>
</tr>
<tr>
<td>LAND ARC 556</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Code</td>
<td>Title</td>
<td>Credits</td>
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<tr>
<td>GEOG 360</td>
<td>Quantitative Methods in Geographical Analysis</td>
<td>4</td>
</tr>
<tr>
<td>GEOG 370</td>
<td>Introduction to Cartography</td>
<td>4</td>
</tr>
<tr>
<td>GEOG/ENVIR ST/F&amp;W ECOL/G LE/GEOSCI/LAND ARC 371</td>
<td>Introduction to Environmental Remote Sensing</td>
<td>3</td>
</tr>
<tr>
<td>GEOG/CIV ENGR/ENVIR ST 377</td>
<td>An Introduction to Geographic Information Systems</td>
<td>4</td>
</tr>
<tr>
<td>GEOSCI/CIV ENGR/ENVIR ST/G LE 444</td>
<td>Practical Applications of GPS Surveying</td>
<td>2</td>
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<tr>
<td>SOIL SCI/ENVIR ST/LAND ARC 695</td>
<td>Applications of Geographic Information Systems in Natural Resources</td>
<td>3</td>
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<tr>
<td>A A E/ENVIR ST 244</td>
<td>The Environment and the Global Economy</td>
<td>3</td>
</tr>
<tr>
<td>A A E 246</td>
<td>Climate Change Economics and Policy</td>
<td>3</td>
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<tr>
<td>A A E/ECON/ENVIR ST 343</td>
<td>Environmental Economics</td>
<td>3-4</td>
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<tr>
<td>C&amp;E SOC/F&amp;W ECOL/SOC 248</td>
<td>Environment, Natural Resources, and Society</td>
<td>3</td>
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<tr>
<td>C&amp;E SOC/ENVIR ST/GEOG 434</td>
<td>People, Wildlife and Landscapes</td>
<td>3</td>
</tr>
<tr>
<td>C&amp;E SOC/ENVIR ST/SOC 540</td>
<td>Sociology of International Development, Environment, and Sustainability</td>
<td>3</td>
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<tr>
<td>C&amp;E SOC/SOC 541</td>
<td>Environmental Stewardship and Social Justice</td>
<td>3</td>
</tr>
<tr>
<td>ENVIR ST 349</td>
<td>Climate Change Governance</td>
<td>3</td>
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<tr>
<td>ENVIR ST/M&amp;ENVTOX/PL PATH 368</td>
<td>Environmental Law, Toxic Substances, and Conservation</td>
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<tr>
<td>ENVIR ST/GEOG 439</td>
<td>US Environmental Policy and Regulation</td>
<td>3-4</td>
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<tr>
<td>ENVIR ST/PHILOS 441</td>
<td>Environmental Ethics</td>
<td>3-4</td>
</tr>
<tr>
<td>ENVIR ST/HIST SCI/MED HIST 513</td>
<td>Environment and Health in Global Perspective</td>
<td>3</td>
</tr>
<tr>
<td>GEOG/ENVIR ST 339</td>
<td>Environmental Conservation</td>
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<tr>
<td>GEOG/URB R PL 305</td>
<td>Introduction to the City</td>
<td>3-4</td>
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<tr>
<td>GEOG/ENVIR ST/HISTORY 460</td>
<td>American Environmental History</td>
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<tr>
<td>GEOG/ENVIR ST 537</td>
<td>Culture and Environment</td>
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<tr>
<td>GEOSCI/ENVIR ST 410</td>
<td>Minerals as a Public Problem</td>
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<td>GEOSCI/ENVIR ST 411</td>
<td>Energy Resources</td>
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<tr>
<td>HISTORY/ENVIR ST/GEOG 469</td>
<td>The Making of the American Landscape</td>
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<tr>
<td>POLI SCI 510</td>
<td>Politics of Government Regulation</td>
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<tr>
<td>URB R PL/ECON/ENVIR ST/POLI SCI 449</td>
<td>Government and Natural Resources</td>
<td>3-4</td>
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</table>

### MAJOR ELECTIVES

Select one of two tracks:

### Distributed Electives

Students choosing the Distributed Electives path must complete a total of 12 credits of Environmental Sciences Electives from the categories below, including at least one course from each category.

### Ecology

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>AGRONOMY 300</td>
<td>Cropping Systems</td>
<td>3</td>
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<tr>
<td>AGRONOMY/BOTANY/SOIL SCI 370</td>
<td>Grassland Ecology</td>
<td>3</td>
</tr>
<tr>
<td>BOTANY/F&amp;W ECOL 455</td>
<td>The Vegetation of Wisconsin</td>
<td>4</td>
</tr>
<tr>
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**Environmental Policy & Social Perspectives**

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**Physical Environment**

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Environmental Sciences, B.S. (L&S)

ATM OCN/ENVIR ST/ GEOG/GEOSCI 335 Climatic Environments of the Past 3
ATM OCN/ ENVIR ST 520 Bioclimatology 3
ATM OCN/ ENVIR ST 535 Atmospheric Dispersion and Air Pollution 3
BSE 365 Measurements and Instrumentation for Biological Systems 3
BSE ENVIR ST 367 Renewable Energy Systems 3
BSE 460 Biorefining: Energy and Products from Renewable Resources 3
CIV ENGR 311 Hydroscience 3
CIV ENGR 320 Environmental Engineering 3
CIV ENGR 423 Air Pollution Effects, Measurement and Control 3
CIV ENGR 424 Environmental Engineering Laboratory 2
ENVIR ST/ POP HLTH 502 Air Pollution and Human Health 3
GEOG/GEOSCI 320 Geomorphology 3
GEOG 321 Climatology 3
GEOG ENVIR ST 325 Analysis of the Physical Environment 4
GEOG 329 Landforms and Landscapes of North America 3
GEOG/ATM OCN/ ENVIR ST 332 Global Warming: Science and Impacts 3
GEOG/BOTANY 338 Environmental Biogeography 3
GEOG/GEOSCI 420 Glacial and Pleistocene Geology 3
GEOG/GEOSCI 524 Advanced Landform Geography 3
GEOSCI 304 Geobiology 3
GEOSCI/G LE 627 Hydrogeology 3-4
POP HLTH/ ENVIR ST 471 Introduction to Environmental Health 3
SOIL SCI 301 General Soil Science 4
SOIL SCI 321 Soils and Environmental Chemistry 3
SOIL SCI/ ENVIR ST 324 Soils and Environmental Quality 3
SOIL SCI/ F&W ECOL 451 Environmental Biogeochemistry 3
SOIL SCI/ AGRONOMY/ ATM OCN 532 Environmental Biophysics 3
SOIL SCI/CIV ENGR/ M&ENVTOX 631 Toxicants in the Environment: Sources, Distribution, Fate & Effects 3

Geospatial Sciences

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GEOSCI/CIV ENGR/ ENVIR ST 377 An Introduction to Geographic Information Systems 4
GEOSCI/CIV ENGR/ ENVIR ST 444 Practical Applications of GPS Surveying 2
SOIL SCI/ENVIR ST/ LAND ARC 695 Applications of Geographic Information Systems in Natural Resources 3

Area of Focus

Students choosing the Focused Electives path must complete a total of 12 credits of Environmental Sciences Electives from one of the following categories.¹

Ecology

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¹ Please refer to the course catalog for the most up-to-date and accurate information.
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1 Consult environmental sciences advisor regarding alternate ways to complete the major electives.

**CAPSTONE**

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<td>LAND ARC 668</td>
<td>Restoration Ecology</td>
<td>3</td>
</tr>
<tr>
<td>PL PATH 315</td>
<td>Plant Microbiomes</td>
<td>4</td>
</tr>
<tr>
<td>SOIL SCI 499</td>
<td>Soil Management</td>
<td>3</td>
</tr>
</tbody>
</table>

1 Students may speak with their environmental science advisor about alternatives (e.g., courses, directed study, senior thesis) to complete the capstone. To be approved, the alternative must be taken for a minimum of 3 credits, clearly focused on environmental science, and approved by the Environmental Sciences Administrative Committee. Students must consult with their environmental sciences advisor and fill out all necessary paperwork before registering.

**RESIDENCE AND QUALITY OF WORK**

- 2.000 GPA in all major courses
- 2.000 GPA and 15 credits of upper level major courses taken in residence 1
- 15 credits in the major taken on the UW–Madison campus

1 Courses numbered 300 through 699 are considered upper level in this major.

**HONORS IN THE MAJOR**

Honors in the Major is not available in environmental sciences.

**UNIVERSITY DEGREE REQUIREMENTS**

**Total Degree**

To receive a bachelor’s degree from UW–Madison, students must earn a minimum of 120 degree credits. The requirements for some programs may exceed 120 degree credits. Students should consult with their college or department advisor for information on specific credit requirements.

**Residency**

Degree candidates are required to earn a minimum of 30 credits in residence at UW–Madison. "In residence" means on the UW–Madison campus with an undergraduate degree classification. "In residence" credit also includes UW–Madison courses offered in distance or online formats and credits earned in UW–Madison Study Abroad/Study Away programs.

**Quality of Work**

Undergraduate students must maintain the minimum grade point average specified by the school, college, or academic program to remain in good academic standing. Students whose academic performance drops below these minimum thresholds will be placed on academic probation.

**LEARNING OUTCOMES**

1. Demonstrate understanding of Environmental Science fundamentals in the context of biology, chemistry, mathematics, statistics, and physics.

2. Demonstrate a quantitative and qualitative understanding of the ecological relationships (material and energetic) between organisms, both as individuals and in groups, and their biotic and abiotic environment. This may include processes influencing the distribution and abundance of organisms.

3. Demonstrate a quantitative and qualitative understanding of the physical, largely abiotic, conditions (e.g. climate, water, soil, air, noise, greenspace, etc.) of the environment. The physical environment can include natural or managed settings such as urban environments.

4. Demonstrate a quantitative and qualitative understanding of geospatial processes and information as it relates to the environment including how to collect, interpret, and analyze geospatial information regarding the features of the Earth’s surface. These technologies may include geographic information systems (GIS), the global positioning system (GPS), digital maps, and satellite based remote sensing.

5. Demonstrate a basic understanding of relationships that focus on the organization and implementation of laws, regulations, and other policy mechanisms concerning environmental issues and sustainability and their effect on society. This includes how human behaviors influences, and are also influenced by, the natural environment.

6. Apply skills in critical thinking, problem identification and resolution of a complex environmental issues that require interdisciplinary solutions and team-based work.

7. Articulate the role of environmental science in one or more focused areas of a specific environmental discipline (e.g. geology, soils, atmosphere, water, plants, animals).

8. Demonstrate expertise in organizing and presenting (written and oral) scientific information to both lay and professional audiences.
ADVISING AND CAREERS

ADVISING
Students wishing to declare the environmental sciences major should meet with an academic advisor. Contact information for advisors can be found here (http://envirosco.wisc.edu/advising).

CALS undergraduate students interested in pursuing the environmental sciences major in the College of Agricultural and Life Sciences should contact Kathryn Jones, kjones26@wisc.edu or 608-807-7391.

L&S undergraduate students interested in pursuing the environmental sciences major in the College of Letters & Science should contact Eric Schueffner, elschueffner@wisc.edu or 608-890-3231.

CAREERS
A major in environmental sciences serves as excellent preparation for careers of great diversity, including environmental modeling, agricultural scientist, botanist, ecologist, forest ranger, oceanographer, agricultural technician, engineering technician, forester, air and water quality manager, environmental analyst, park ranger, air pollution analyst, environmental consultant, environmental educator, geologist, project manager, environmental engineer, geophysicist, biologist, hazardous waste manager, hydrologist, environmental lawyer, chemical technician, soil conservation technician, chemist, management consultant, teacher, meteorologist, urban and regional planner, civil engineer, environmental planner, microbiologist/wastewater plant operator, natural resource specialist, wildlife manager, conservationist, or zoologist. For more info about careers, please visit our website (http://envirosco.wisc.edu/careers-internships).

L&S CAREER RESOURCES
SuccessWorks at the College of Letters & Science helps students leverage the academic skills learned in their major, certificates, and liberal arts degree; explore and try out different career paths; participate in internships; prepare for the job search and/or graduate school applications; and network with professionals in the field (alumni and employers).

SuccessWorks can also assist students in career advising, résumé and cover letter writing, networking opportunities, and interview skills, as well as course offerings for undergraduates to begin their career exploration early in their undergraduate career.

- SuccessWorks (https://careers.ls.wisc.edu)
- Set up a career advising appointment (https://careers.ls.wisc.edu/make-an-appointment)
- INTER-LS 210 L&S Career Development: Taking Initiative (1 credit, targeted to first- and second-year students)—for more information, see Inter-LS 210: Career Development, Taking Initiative (https://careers.ls.wisc.edu/inter-ls-210-career-development-taking-initiative)
- Learn how we’re transforming career preparation: L&S Career Initiative (http://ls.wisc.edu/lsci)

PEOPLE

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