The Environmental Science Program combines both geological and biological perspectives to give students an interdisciplinary approach to the subject. It is the only undergraduate Bachelor of Science degree program addressing environmental issues at WSU. In keeping with the mission of the university, this program distinguishes itself from other programs in the state by focusing on the urban environment and urban impacts on the environment. Consequently, the program addresses environmental issues and examples from Southeastern Michigan.

The Environmental Science Program prepares students for graduate study or careers in various areas of environmental science including environmental impact assessment, wetlands, water quality, regulatory compliance and remediation. Environmental Science graduates are needed by local, state and federal governments, by environmental consulting firms, and by construction and civil engineering companies. In many cases, employers favor masters-level graduates, so an important objective of this program is to provide graduates with the prerequisites for admission to M.S. programs in Environmental Sciences. This major also serves education students seeking to become science teachers certified in Environmental Science.

Environmental science is a field that continues to grow. Greater public recognition of environmental problems coupled with recent concerns about global warming and national security are creating a demand for environmental scientists and a need for an environmental science resource to serve the Detroit metropolitan area. This program provides a visible focus for environmental research at WSU. Its emphasis on geological and biological aspects of environmental science complements the existing focus on human health and chemical toxicology in the WSU Institute of Environmental Health Sciences.

Program Director: Lawrence D. Lemke
0224 Old Main
(313) 577-6412
ldlemke@wayne.edu

Program Advisor: Cody Bailey
0204 Old Main
(313) 577-2295
bailey.cody@wayne.edu

Faculty Steering Committee:
Mark Baskaran, Professor, Geology
Sarah Brownlee, Assistant Professor, Geology
D. Carl Freeman, Professor, Biological Sciences
Jeffrey Howard, Associate Professor, Geology
Dan Kashian, Associate Professor, Biological Sciences
Donna Kashian, Associate Professor, Biological Sciences
Lawrence D. Lemke, Associate Professor, Geology
Chris Steiner, Associate Professor, Biological Sciences
Admission Requirements for this program are satisfied by the requirements for general undergraduate admission to the University.

Degree Requirements: Candidates for the B.S. in Environmental Science must complete at least 120 credits in course work including satisfaction of the College Group Requirements and the University General Education Requirements, as well as the major requirements listed below. All course work must be completed in accordance with the academic procedures of the University and the College of Science governing undergraduate scholarship and degrees. Students must receive a grade of ‘C-minus’ or better in all Major and Cognate required courses. An overall grade point average of 2.0 (“C”) in all coursework is required for graduation.

Major Requirements: B.S. candidates in Environmental Science must complete 36 credits of required courses including GEL 1010, GEL 2130, GEL 3100, GEL 5150, GEL 5510, BIO 1500, BIO 1510, BIO 4130, and BIO 5100 or BIO 5440; plus three science or engineering electives (9 to 12 credits) from the approved list (see next page).

Cognate Requirements: B.S. candidates in Environmental Science must take MAT 1800, MAT 2010, PHY 2130 (or PHY 2170), PHY 2131 (or PHY 2171), PHY 2140 (or PHY 2180), PHY 2141 (or PHY 2181), CHM 1220, CHM 1230, CHM 1240 and CHM 1250. Majors should take the placement examination of the Department of Mathematics as soon as possible upon entry into the freshman year.

Major Requirements:  (effective Winter 2016 semester)

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<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<td>GEL 1010</td>
<td>Geology: The Science of the Earth</td>
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<td>GEL 2130</td>
<td>Mineralogy</td>
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<td>GEL 3100</td>
<td>Environmental Systems Analysis</td>
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<td>GEL 5150</td>
<td>Soils and Soil Pollution</td>
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<td>GEL 5510</td>
<td>Contaminant Fate and Transport</td>
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<td>BIO 1500</td>
<td>Basic Life Diversity</td>
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<tr>
<td>BIO 1510</td>
<td>Basic Life Mechanisms</td>
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<td>BIO 4130</td>
<td>Ecology (WI)</td>
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<tr>
<td>BIO 5100</td>
<td>Aquatic Ecology or Terrestrial Ecology</td>
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<tr>
<td>BIO 5440</td>
<td></td>
<td>9</td>
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<tr>
<td>Min. 9 approved electives</td>
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Cognate Requirements:

B.S. candidates in Environmental Science must take

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<tr>
<td>MAT 1800</td>
<td>Elementary Functions</td>
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<td>MAT 2010</td>
<td>Calculus I</td>
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<td>PHY 2130</td>
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<td>PHY 2131</td>
<td>General Physics Laboratory (or PHY 2171)</td>
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<td>PHY 2140</td>
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<td>PHY 2141</td>
<td>General Physics Laboratory (or PHY 2181)</td>
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<td>CHM 1220</td>
<td>Chemical Structure, Bonding and Reactivity</td>
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<td>CHM 1230</td>
<td>Chemical Principles in the Laboratory</td>
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<tr>
<td>CHM 1240</td>
<td>Principles of General /Organic Chemistry</td>
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<tr>
<td>CHM 1250</td>
<td>General /Organic Chemistry Laboratory</td>
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<td>Total</td>
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</table>
ELECTIVE COURSES

At least one elective must be chosen from any of the following GEL or BIO courses:

GEOLOGY
- GEL 3160 - Petrology
- GEL 3300 - Structural Geology
- GEL 3400 - Sedimentology and Stratigraphy
- GEL 3450 - Principles of Paleontology
- GEL 3650 - Field Geology (field course)
- GEL 4200 - Geomorphology
- GEL 5000 - Geological Site Assessment
- GEL 5120 - Environmental Geochemistry
- GEL 5450 - Hydrogeology
- GEL 6400 - Nuclear Geology
- GEL 6500 - Economic Geology

BIOLOGY
- BIO 2200 - Introductory Microbiology
- BIO 3500 – Ecology and the Environment
- BIO 4420 - Biogeography
- BIO 5040 - Biometry
- BIO 5100 - Aquatic Ecology (field course)
- BIO 5180 - Field Investigations in Bio Sci (field course)
- BIO 5440 - Terrestrial Ecology (field course)
- BIO 5490 - Population and Community Ecology
- BIO 5540 - Ecosystem and Landscape Ecology
- BIO 6190 - Ecotoxicology
- BIO 6450 - Aquatic Botany (field course)
- BIO 6640 - Advanced Ecology (field course)

A maximum of two electives may be chosen from any of the following courses:
(Note: Any necessary prerequisite courses would not count as Environmental Science electives)

CHEMICAL ENGINEERING
- CHE 6610 - Risk Assessment

CIVIL AND ENVIRONMENTAL ENGINEERING
- C E 3250 - Applied Fluid Mechanics
- C E 4210 - Introduction to Environmental Engineering
- C E 5230 - Water Supply and Wastewater Engineering
- C E 5580 - Land Disposal of Hazardous Waste
- C E 5590 - Biological Methods of Waste Disposal
- C E 5595 - River Assessment and Restoration (field course)
- C E 5995 - Applied Environmental Microbiology
- C E 6190 - Groundwater
- C E 6270 - Environmental Management and Sustainable Development

HONORS SEMINAR OPTION
- HON 4220 – (LS) Environment: Perception, Behavior and Health

GEOGRAPHY and URBAN PLANNING
- GPH 3600 - Introduction to Geographic Information Systems
- GPH 4600 - Advanced Geographic Information Systems
- U P 5999 - Cities and Food