

# BACHELOR OF SCIENCE IN ENVIRONMENTAL SCIENCE

The environmental science program leading to a Bachelor of Science (BS) prepares students for graduate school or careers in health and safety, natural resource management, public health, environmental consulting, environmental regulations, environmental education, and other related fields:

- 42-44 s.h. of environmental science courses
- 30-31 s.h. of support courses in science and mathematics
- a prescribed minor of 12-19 s.h

The minor must include 9 s.h. of upper division courses (3000 level and above) and may be in:

- biology or biomathematics
- biological or forensic anthropology
- biological or forensic anthropology
- chemistry
- economics
- environmental engineering
- environmental geography or geography
- environmental health and safety
- forensic science
- geographic information science
- geoscience or environmental geology
- law enforcement
- mathematics or statistics
- mechanical engineering
- public health

Credits may include those required for support science and mathematics, as applicable. The student is welcome to take additional courses in other departments as electives. Students are encouraged to develop teamwork, communication, computer and problem-solving skills. This degree may be earned in eight semesters if students average 15 hours per semester.

Majors transferring in from other programs at YSU or from other universities may use up free electives and/or require additional semesters or summers of study. College and university requirements apply (total hours, upper division hours, general education goals, etc.).

| COURSE  | TITLE                        | S.H. |
|---|------------------------------|------|
| FIRST YEAR REQUIREMENT -STUDENT SUCCESS   |                              |      |
| YSU 1500  | Success Seminar              | 1-2  |
| or SS 1500  | Strong Start Success Seminar |      |
| or HONR 1500  | Intro to Honors              |      |
| General Education Requirements  |                              |      |
| ENGL 1550   | Writing 1                    | 3-4  |
| or ENGL 1549  | Writing 1 with Support       |      |
| ENGL 1551   | Writing 2                    | 3    |
| CMST 1545   | Communication Foundations    | 3    |
| Mathematics Requirement (met with MATH 1570 or 1571 in major)   |                              |      |
| Arts and Humanities (6 s.h.)  |                              | 6    |
| Natural Sciences (2 courses, 1 with lab) (6-7 s.h.)(Requirement met through science courses in major) |                              | 0    |
| Social Science (6 s.h.)   |                              | 6    |
| Social and Personal Awareness (6 s.h.)  |                              | 6    |
| Major Core Requirements   |                              |      |

|                                    |   |     |
|------------------------------------|---|-----|
| ENST 2600 & 2600L                  | Foundations of Environmental Science and Foundations of Environmental Science Laboratory                      | 4   |
| ENST 2620                          | Freshman/Sophomore Seminar  | 1   |
| ENST 3700 & 3700L                  | Environmental Chemistry and Environmental Chemistry Lab   | 4   |
| ENST 3730                          | Air Quality   | 3   |
| ENST 3750                          | Seminar   | 1   |
| ENST 3751 or ENST 3752             | Water Quality Analysis<br>Soil Quality and Analysis   | 3   |
| ENST 3780 & ENST 3775 or ENST 3784 | Environmental Research and Research Methods for Undergraduate<br>Research Experience in Environmental Science | 4-5 |
| ENST 3790                          | Internship/Cooperative  | 4   |
| ENST 5810                          | Environmental Safety  | 3   |
| ENST 5860                          | Environmental Regulations   | 3   |

## Upper Division Electives

Select 12 credit hours from ENST 3700 level courses or higher. 3-4 credit 12-14 hours of a 3700 or higher level course may come from Biology, Chemistry, Geology, Civil/Environmental Engineering or select Geography courses.

|                         |  |   |
|-------------------------|--|---|
| CHEM 1515 & 1515L       | General Chemistry 1 and General Chemistry 1 Laboratory <sup>1</sup>                          | 4 |
| CHEM 1516 & 1516L       | General Chemistry 2 and General Chemistry 2 Laboratory <sup>1</sup>                          | 4 |
| CHEM 1515R & CHEM 1516R | Recitation for General Chemistry 1 and Recitation for General Chemistry 2 (optional)         |   |
| BIOL 2601 & 2601L       | General Biology 1: Molecules and Cells and General Biology I: Molecules and Cells Laboratory | 4 |
| GEOL 1505 & 1505L       | Physical Geology and Physical Geology Laboratory (satisfies GER Science or Lab) <sup>1</sup> | 4 |
| MATH 1571 or MATH 1570  | Calculus 1 <sup>2</sup><br>Applied Calculus 1  | 4 |
| GEOG 2611               | Geospatial Foundations   | 3 |
| PHYS 1501 or PHYS 2610  | Fundamentals of Physics 1<br>General Physics 1   | 4 |

## Statistics--Take one of the following:

|  |   |     |
|--|---|-----|
| STAT 2601 or STAT 2625 or STAT 3717 or STAT 3743 | Introductory Statistics<br>Statistical Literacy and Critical Reasoning<br>Statistical Methods<br>Probability and Statistics | 3-4 |
|--|---|-----|

**Minor** 12

**Electives to reach 120** 8

**Total Semester Hours** 120-126

<sup>1</sup> Satisfies General Education Science or Science Lab Domain.

<sup>2</sup> Satisfies General Education Mathematics Domain.

<sup>3</sup> Satisfies General Education Science Domain.

## Year 1

| Fall                      |  | S.H. |
|---------------------------|--|------|
| YSU 1500                  | Success Seminar  | 1    |
| CHEM 1515<br>& 1515L      | General Chemistry 1<br>and General Chemistry 1 Laboratory                                      | 4    |
| ENGL 1550<br>or ENGL 1549 | Writing 1<br>or Writing 1 with Support   | 3-4  |
| ENST 2600<br>& 2600L      | Foundations of Environmental Science<br>and Foundations of Environmental Science<br>Laboratory | 4    |

|                           |  |
|---------------------------|--|
| GER SS or AH Course       | 3  |
| Additional Math if needed | 0-4  |
| <b>Semester Hours</b>     | <b>15-20</b>   |
| <b>Spring</b>             |  |
| CHEM 1516 & 1516L         | General Chemistry 2 and General Chemistry 2 Laboratory 4 |
| ENGL 1551                 | Writing 2 3  |
| ENST 2620                 | Freshman/Sophomore Seminar 1                             |
| Additional Math if needed | 0-4  |
| GER SS or AH course       | 3  |
| GER SPA Course            | 3  |
| <b>Semester Hours</b>     | <b>14-18</b>   |

**Year 2****Fall**

|                        |  |
|------------------------|--|
| MATH 1570 or MATH 1571 | Applied Calculus 1 or Calculus 1 4   |
| BIOL 2601 & 2601L      | General Biology 1: Molecules and Cells and General Biology I: Molecules and Cells Laboratory 4 |
| CMST 1545              | Communication Foundations 3  |
| ENST 3730              | Air Quality 3  |
| <b>Semester Hours</b>  | <b>14</b>  |

**Spring**

|                       |  |
|-----------------------|--|
| GEOL 1505 & 1505L     | Physical Geology and Physical Geology Laboratory 4 |
| GEOG 2611             | Geospatial Foundations 3                           |
| ENST 3700             | Environmental Chemistry 4                          |
| GER SPA Course        | 3  |
| GER SS or AH Course   | 3  |
| <b>Semester Hours</b> | <b>17</b>  |

**Year 3****Fall**

|                        |   |
|------------------------|---|
| ENST 3781              | Environmental Sampling Methods 3                      |
| ENST 5860              | Environmental Regulations 3                           |
| ENST 3751 or ENST 3752 | Water Quality Analysis or Soil Quality and Analysis 3 |
| Minor Course           | 3   |
| GER SS or AH Course    | 3   |
| <b>Semester Hours</b>  | <b>15</b>   |

**Spring**

|                        |  |
|------------------------|--|
| ENST 5800              | Environmental Impact Assessment 3                |
| ENST 3751              | Water Quality Analysis 3                         |
| ENST 3750              | Seminar 1  |
| Minor Minor Course     | 3  |
| Major Course > 3700    | 3  |
| PHYS 1501 or PHYS 2610 | Fundamentals of Physics 1 or General Physics 1 4 |
| <b>Semester Hours</b>  | <b>17</b>  |

**Year 4****Fall**

|                       |                                  |
|-----------------------|----------------------------------|
| ENST 5830             | Toxicology and Risk Assessment 3 |
| ENST 3790             | Internship/Cooperative 4         |
| Minor Course          | 3                                |
| Minor Course          | 3                                |
| Major Course > 3700   | 3                                |
| <b>Semester Hours</b> | <b>16</b>                        |

**Spring**

|                                    |  |
|------------------------------------|--|
| ENST 3780 & ENST 3775 or ENST 3784 | Environmental Research or Research Experience in Environmental Science 4-5 |
| ENST 5810                          | Environmental Safety 1   |
| Major Course > 3700                | 3  |
| Major Course > 3700                | 3  |
| Elective                           | 1  |
| <b>Semester Hours</b>              | <b>12-13</b>   |
| <b>Total Semester Hours</b>        | <b>120-130</b>   |

<sup>1</sup> Elective support courses, select two of the following: PHYS 1501 Fundamentals of Physics 1, GEOG 2630 Weather, or STAT 2601 Introductory Statistics or STAT 3717 Statistical Methods.

Request a Graduation Evaluation after completing 80-85 s.h. from the STEM Advising Center, 2325 Moser Hall, (330) 941-2512.

## Learning Outcomes

The Environmental Science Program educates students in the fundamental knowledge about the environment, its resources, processes, and the changes and problems that have occurred and potential solutions to those problems. The student learning outcomes for the BS in environmental science are:

**Interdisciplinary:** Demonstrate an understanding of basic environmental processes and the contributions of different scientific and social disciplines to environmental issues.

**Research:** Properly apply the scientific method to research an environmental question including design of experiments, acquisition of data (qualitative and quantitative), and articulate results in discussions and conclusions.

**Communicate:** Effectively converse using the language, concepts, and models of environmental science in written, visual, and numerical formats for specific and general audiences.

**Problem Solving:** Demonstrate the ability to identify and apply appropriate field, laboratory, or modeling methods to address environmental problems and propose sustainable solutions.

**Critical Thinking:** Students will utilize their understanding of pollution and environmental systems and published information to systematically, creatively, and analytically examine current issues.