

# ENVIRONMENTAL ENGINEERING MAJOR (B.S.)

<http://ceps.unh.edu/cee/environmental-engineering-bs>

## Description

The Environmental Engineering program is accredited by the:

Engineering Accreditation Commission of ABET  
111 Market Place  
Suite 1050  
Baltimore, MD 21202-4012,  
(410) 347-7700  
<http://www.abet.org>

Environmental engineers graduating with a B.S. ENE degree will plan, design, and construct public and private facilities to minimize the impact of human activity on the environment and to protect human health.

For example, environmental engineers design and build drinking water treatment systems, municipal and industrial wastewater treatment plants, solid waste management facilities, contaminated ground water remediation systems, and hazardous waste remediation facilities. These facilities must meet regulatory requirements, be cost effective to build and maintain, be safe to operate, and have minimal environmental impact. ENE students can also focus on sustainable engineering with a required course (CEE 705 Introduction to Sustainable Engineering) in junior year and two or three senior year electives, including design electives.

In CEE 420 Environmental Engineering Lectures I, students are introduced to the full spectrum of environmental engineering projects that they will subsequently explore in design teams during their degree program. As part of these experiences, students visit and tour field sites (CEE 520 Environmental Pollution and Protection: A Global Context), and through junior and senior year classes and seminars (ASCE, EWRI, EWB, SWB), they interact with engineers who talk about engineering consulting and design practices applied to local projects. As part of these projects, students:

1. analyze treatment alternatives;
2. recommend a system that meets regulatory operational needs, and is sustainable; and
3. prepare an implementation schedule and project budget.

Design projects are performed in CEE 731 Advanced Water Treatment Processes and two design electives. CEE 797 Introduction to Project Planning and Design/ and CEE 798 Project Planning and Design/ serve as a capstone design experience where students work on a multi-disciplinary environmental engineering project and apply skills learned in other courses while working with real-world problems/clients. ENE students do not have to take a course in the Discovery Biological Science category since they satisfy this category with CEE 724 Environmental Engineering Microbiology.

At the end of the sophomore year, students are required to have a minimum overall grade-point average of 2.00 and a grade-point average of 2.00 in the following to be permitted to enroll in junior-level courses:

|          |  |   |
|----------|--|---|
| MATH 425 | Calculus I   | 4 |
| CHEM 405 | Chemical Principles for Engineers                        | 4 |
| PHYS 407 | General Physics I  | 4 |
| MATH 426 | Calculus II  | 4 |
| CEE 500  | Statics for Civil Engineers                              | 3 |
| CEE 520  | Environmental Pollution and Protection: A Global Context | 4 |

To qualify for graduation, an ENE major must: have satisfied the previously specified course requirements, have satisfied the University's Academic Requirements, have a minimum cumulative grade-point average of 2.00, and have a minimum grade-point average of 2.00 in engineering courses.

## Requirements

These are the required major courses. For a full listing of the requirements within the four years of study please refer to the degree plan tab.

|          |  |   |
|----------|--|---|
| CEE 420  | Environmental Engineering Lectures I                     | 3 |
| MATH 425 | Calculus I   | 4 |
| CHEM 405 | Chemical Principles for Engineers                        | 4 |
| ENGL 401 | First-Year Writing                                       | 4 |
| PHYS 407 | General Physics I  | 4 |
| MATH 426 | Calculus II  | 4 |
| ENGL 502 | Professional and Technical Writing                       | 4 |
| CEE 500  | Statics for Civil Engineers                              | 3 |
| CEE 520  | Environmental Pollution and Protection: A Global Context | 4 |
| MATH 527 | Differential Equations with Linear Algebra               | 4 |
| TECH 564 | Fundamentals of CAD                                      | 3 |
| CEE 502  | Project Engineering                                      | 3 |
| MATH 644 | Statistics for Engineers and Scientists                  | 4 |
| CEE 650  | Fluid Mechanics  | 4 |
| CEE 720  | Solid and Hazardous Waste Engineering                    | 3 |
| ESCI 654 | Fate and Transport in the Environment                    | 4 |
| CEE 705  | Introduction to Sustainable Engineering                  | 3 |
| CEE 620  | Fundamental Aspects of Environmental Engineering         | 4 |
| CEE 724  | Environmental Engineering Microbiology                   | 4 |
| CEE 797  | Introduction to Project Planning and Design              | 1 |
| CEE 723  | Water Chemistry  | 4 |
| CEE 721  | Environmental Sampling and Analysis                      | 4 |
| CEE 798  | Project Planning and Design                              | 3 |
| CEE 731  | Advanced Water Treatment Processes                       | 4 |

## Degree Plan

The following schedule is a sample of a planned program for environmental engineering students completing the major.

| Course  | Title  | Credits |
|---|--|---------|
| <b>First Year</b>                                   |  |         |
| <b>Fall</b>   |  |         |
| CEE 420   | Environmental Engineering Lectures I                     | 3       |
| ENGL 401  | First-Year Writing                                       | 4       |
| MATH 425  | Calculus I <sup>1</sup>                                  | 4       |
| CHEM 405  | Chemical Principles for Engineers                        | 4       |
| Discovery Electives <sup>2</sup>                    |  | 4       |
|   | Credits  | 19      |
| <b>Spring</b>                                       |  |         |
| ENGL 502  | Professional and Technical Writing                       | 4       |
| MATH 426  | Calculus II <sup>1</sup>                                 | 4       |
| PHYS 407  | General Physics I  | 4       |
| Discovery Electives <sup>2</sup>                    |  | 4       |
|   | Credits  | 16      |
| <b>Second Year</b>                                  |  |         |
| <b>Fall</b>   |  |         |
| CEE 520   | Environmental Pollution and Protection: A Global Context | 4       |
| CEE 500   | Statics for Civil Engineers                              | 3       |
| MATH 527  | Differential Equations with Linear Algebra               | 4       |
| TECH 564  | Fundamentals of CAD                                      | 3       |
| Discovery Elective                                  |  | 4       |
|   | Credits  | 18      |
| <b>Spring</b>                                       |  |         |
| MATH 644  | Statistics for Engineers and Scientists                  | 4       |
| CEE 502   | Project Engineering                                      | 3       |
| Discovery Elective                                  |  | 4       |
| Public Health Elective                              |  | 3-4     |
| Discovery or Geospatial Course                      |  | 3-4     |
|   | Credits  | 17-19   |
| <b>Third Year</b>                                   |  |         |
| <b>Fall</b>   |  |         |
| CEE 705   | Introduction to Sustainable Engineering                  | 3       |
| CEE 650   | Fluid Mechanics  | 4       |
| CEE 720   | Solid and Hazardous Waste Engineering                    | 3       |
| ESCI 654  | Fate and Transport in the Environment                    | 4       |
|   | Credits  | 14      |
| <b>Spring</b>                                       |  |         |
| CEE 620   | Fundamental Aspects of Environmental Engineering         | 4       |
| CEE 724   | Environmental Engineering Microbiology                   | 4       |
| Hydrology Elective <sup>4</sup>                     |  | 3-4     |
| Discovery or Geospatial Science Course <sup>5</sup> |  | 3-4     |
|   | Credits  | 14-16   |
| <b>Fourth Year</b>                                  |  |         |
| <b>Fall</b>   |  |         |
| CEE 721   | Environmental Sampling and Analysis                      | 4       |
| CEE 723   | Water Chemistry  | 4       |
| CEE 797   | Introduction to Project Planning and Design              | 1       |
| CEE Design Electives                                |  | 3-4     |

|                            |                                    |
|----------------------------|------------------------------------|
| CEE Electives <sup>4</sup> | 3-4                                |
| Credits                    | 15-17                              |
| <b>Spring</b>              |                                    |
| CEE 731                    | Advanced Water Treatment Processes |
| CEE 798                    | Project Planning and Design        |
| CEE Electives              | 3-4                                |
| CEE Electives <sup>4</sup> | 3-4                                |
| Hydraulics Elective        | 3-4                                |
| Credits                    | 16-19                              |
| Total Credits              | 129-138                            |

<sup>1</sup> Students who are required to take MATH 418 Analysis and Applications of Functions because they did not pass the placement examination as determined by the Mathematics Department prior to the fall semester, will enroll in MATH 425 Calculus I during the spring semester. Subsequent MATH courses (MATH 426 Calculus II, MATH 527 Differential Equations with Linear Algebra, MATH 644 Statistics for Engineers and Scientists) will be taken one semester later than shown here.

<sup>2</sup> See Discovery Program requirements. The Discovery requirements for Writing, Quantitative Reasoning, and Physical Science are fulfilled by ENGL 401 First-Year Writing, MATH 425 Calculus I, and PHYS 407 General Physics I, respectively. CEE 520 Environmental Pollution and Protection: A Global Context fulfills the Environmental, Technology, and Society requirement. CEE 797 Introduction to Project Planning and Design and CEE 798 Project Planning and Design fulfill the Senior Capstone requirement. Environmental Engineering Microbiology fulfills the Biological Science requirement. Courses in the ENE curriculum designated Discovery Electives can be selected from the University's approved Discovery Program courses in Fine and Performing Arts, Humanities, Historical Perspectives, World Cultures, and Social Science. One of these electives must have an Inquiry attribute.

<sup>3</sup> GIS elective may also be taken in the third year with a second Discovery elective taken in second year.

<sup>4</sup> Approved lists of technical, hydrology, hydraulics, and CEE design and non-design electives are available from the ENE undergraduate coordinator, Nancy Kinner. Students must take a minimum of four 700-level CEE electives totaling at least 12 credits. Two CEE elective courses must be from the design category.

<sup>5</sup> Discovery elective or GIS elective can be taken here as appropriate.

The ENE program requires a minimum of 129 total credits for graduation.