

Environmental Engineering

Department Information

- **Department Location:**
Civil & Industrial Engineering 201
- **Department Phone:**
701-231-7244
- **Department Web Site:**
www.ndsu.edu/cee/ (<http://www.ndsu.edu/cee/>)
- **Credential Offered:**
B.S.Env.E.
- **Official Program Curriculum:**
catalog.ndsu.edu/undergraduate/program-curriculum/environmental-engineering/ (<http://catalog.ndsu.edu/undergraduate/program-curriculum/environmental-engineering/>)

Would you like to make this world a better place to live by focusing on the interactions between humans and the environment? You could make a difference by choosing a career in environmental engineering. In general, environmental engineers integrate and apply biological, chemical, and engineering principles to improve and sustain the environment for the protection of its ecosystems, human health, and environmentally-related enhancement of the quality of life. The discipline focuses on water and wastewater treatment system design and public health protection; traditional and emerging contaminant mitigation in water, soil, and air; ecological principles in the design process; green manufacturing; and, sustainable design. Environmental engineers will play a crucial role in numerous 21st century challenges, including: sustainably supplying food, water, and energy; designing a future without pollution and waste; creating efficient, healthy, and resilient cities; fostering informed decisions and actions; and, curbing climate change and adapting to its impacts.[1] (p.)

The Program

Environmental engineers are professionals who have broad scientific and technical knowledge, possess strong problem-solving and design skills, and enjoy working with people. Our work is directly related to the public and environmental health and well-being, which has a significant impact on decision making and planning processes.

NDSU's B.S. in Environmental Engineering degree program, housed in the Department of Civil and Environmental Engineering, began accepting students in fall 2020. Its graduates will be sought by companies nationally at competitive salaries, and they will apply their skills in all fields of the profession domestically and abroad. The graduates will most certainly put their education to good use, bettering themselves and the world in which they live. In addition to the B.S. in Environmental Engineering, the department offers the M.S. degree in Environmental Engineering; the B.S., M.S., and Ph.D. degrees in Civil Engineering; and, participates in interdisciplinary graduate programs such as a Ph.D. degree in Materials and Nanotechnology, M.S. and Ph.D. degrees in Natural Resources Management, M.S. and Ph.D. degrees in Environmental Conservation Sciences, a Ph.D. degree in Transportation and Logistics, and M.S. and Ph.D. degrees in Biomedical Engineering.

Mission

The mission of the Department of Civil and Environmental Engineering is to:

1. Provide quality education to prepare nationally competitive undergraduate students for successful careers in civil and environmental engineering;
2. Provide advanced skills and knowledge in state-of-the-art research and design in sub-areas of civil and environmental engineering for graduate students; and,
3. Provide service to the university, engineering profession, and the public.

Program Educational Objectives

The following program educational objectives are consistent with the university, college and department missions. Graduates of our B.S. in Environmental Engineering program are expected within a few years of graduation to:

1. Engage successfully in the practice of engineering to solve current and emerging problems.
2. Conduct design in a manner that is ethical, includes diverse perspectives, and realizes the broader societal and sustainability implications of the design and decision-making process.
3. Ascend to leadership roles within the workplace via initiative and responsible stewardship.
4. Advance their profession and communities through collaborative work, professional licensure, advanced degrees, lifelong learning, and engaged service.

A Flexible Curriculum

First year environmental engineering students at NDSU begin their education with fundamental courses in English, chemistry, math, introduction to environmental engineering, design and analysis methods and tools, and engineering science. Second-year courses emphasize environmental engineering fundamentals, microbiological principles, fluid mechanics, graphic communications, math and statistical analyses, and engineering science courses. During the third year, students gain exposure and knowledge in sustainable design, unit operations and processes, fate and transport of pollutants, soil mechanics, environmental chemistry, ethics, water resources, physics, and three hours of technical electives. The senior year focuses on specialized courses in air pollution, solid and hazardous waste management, water and wastewater treatment and design, hydrology, a one-year capstone senior design experience, and six hours of technical electives. The technical electives allow the student to take additional courses in those areas of environmental engineering/science in which she or he intends to practice professionally.

Faculty

The department has well-qualified and dedicated faculty members. They are nationally and internationally recognized experts, with the knowledge and experience to prepare graduates for successful careers. All faculty members in the department have a doctoral degree. All classes are taught/assessed by full-time professors, and supplemented by lectures from leaders from the industry.

Modern, Well-Equipped Facilities

The department has excellent laboratory facilities for undergraduate education and research, including the new undergraduate laboratories for water resources and environmental engineering and several state-of-the-art research laboratories.

Student Organizations

Students participate in several professional departmental student organizations, which helps them develop leadership and teamwork skills. The NDSU American Water Works Association (AWWA) and the Water Environment Federation (WEF) student chapter has won 2 national design competitions. Students may also participate in a number of student organizations within the College of Engineering, including Engineers Without Borders (EWB), Society of Women Engineers (SWE), National Society of Black Engineers (NSBE), and American Indian Science and Engineering Society (AISES).

Preparation

High school students who wish to prepare for college engineering should attempt to complete the following high school credits: one unit of physics, four units of math, and one unit of chemistry. Nationally, incoming freshmen prepared to enroll in calculus frequently complete their environmental engineering degree in four years. Students who have studied two years of pre-engineering at another institution can normally complete the environmental engineering degree in two additional years beginning with the 2022-2023 academic year.

Scholarships and Financial Aid

The Department of Civil and Environmental Engineering awards numerous scholarships each year, which range from \$500 - \$10,000. Students should check with the department for more information.

Career Opportunities

NDSU environmental engineering students will be highly sought for internships and co-ops, with most students having completed multiple work experiences. Graduates from the program will be widely regarded as hands-on, can-do, project-ready professionals, who will be very successful in finding excellent jobs. Most students will have selected a job before graduation and others within a few weeks of graduation. The work varies in regard to the type of activity and location. Environmental engineers can work in the office, in the field, or a combination of the two. They can work primarily with a number of intricate designs or with people in management or sales. Environmental engineering graduates normally go to work at consulting firms, governmental (state and federal) agencies, NGOs, or industry. The academic curriculum also prepares environmental engineering graduates for graduate school, law school, and/or an MBA program.

Since this degree program began in fall 2020, there job placement data is not currently available.

[1] (p.) National Academies of Sciences, Engineering, and Medicine. 2019. Environmental Engineering for the 21st Century: Addressing Grand Challenges. Washington, DC: The National Academies Press. doi: <https://doi.org/10.17226/25121>.

Sample Program Guide

Please note this is a sample program guide and not an official curriculum. Actual student schedules for each semester will vary depending on start year, education goals, applicable transfer credit, and course availability. Once admitted, students are encouraged to work with their assigned academic advisor on a regular basis to review degree progress.

Freshman			
Fall	Credits	Spring	Credits
ENVE 111		1 ENVE 211	1
CHEM 121		3 CHEM 122	3
CHEM 121L		1 CHEM 122L	1
ENGL 110		3 COMM 110	3
ENGL 120		3 MATH 166	4
MATH 165		4 ME 221	3
		Gen Ed Humanities (A)	3
		15	18
Sophomore			
Fall	Credits	Spring	Credits
ENVE 250		3 ENVE 350	3
CE 212		3 CE 309	3
CHEM 240		3 IME 460	3
GEOL 105		3 MATH 266	3
MATH 259		3 MATH 128	1
ME 222		3 ME 223	3
		Gen Ed Wellness (W)	2
		18	18
Junior			
Fall	Credits	Spring	Credits
ENVE 360		3 ENVE 412	2
ENVE 370		3 ENVE 450	1
CE 310		1 ENVE 460	3
CE 316		3 CE 408	3
ENGL 321		3 ENGR 311 (Fulfills Gen Ed (A))	3
PHYS 252		4 ENGR 402	1
		Technical Elective	3
		17	16
Senior			
Fall	Credits	Spring	Credits
ENVE 488		2 ENVE 489	2
CE 410		3 CE 472	3
CE 477		3 CE 473	3
IME 440		2 ENGR 312 (Fulfills Gen Ed (B))	3
Technical Elective		3 Technical Elective	3
Gen Ed Social & Behavioral Sci (B)		3	
		16	14
Total Credits: 132			