CIVIL ENGINEERING

Would you like to make this world a better place to live, and improve the quality of life for all of us? You could do just that by choosing a career in civil engineering. Civil engineers play an enviable role in enhancing the quality of life and positively impacting the everyday life of people everywhere. We design solutions for the infrastructure of society and the environment in which we live. Civil engineering projects may include designing structures such as buildings, bridges and sports stadiums; transportation infrastructures such as highways, railroads, pipelines, waterways, ports and airports; safe drinking water supply and sewage systems; and averting damage from earthquakes, landslides and floods. The profession embraces new technologies such as nanotechnology, smart materials, sensors, robotics, etc. that are introduced into civil engineering projects to improve reliability, cost-effectiveness and quality of life. We design sustainable solutions to societal challenges today and into the future.

The Program

Civil engineers are professionals who have broad technical knowledge, possess strong problem-solving skills and enjoy working with people. Our work is directly related to the public wellbeing and safety and has a significant impact on decision making and planning processes.

The graduates from North Dakota State University's Department of Civil and Environmental Engineering apply their skills in all fields of the profession domestically and abroad. NDSU civil engineering graduates are sought by companies from all over the country at competitive salaries. They have most certainly put their education to good use, bettering themselves and the world in which they live. The department offers the B.S., M.S. and Ph.D. degrees in Civil Engineering and M.S. degree in Environmental Engineering, and participates in interdisciplinary graduate programs such as a Ph.D. degree in Materials and Nanotechnology, 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. A B.S. degree in Environmental Engineering is planned to begin fall 2020.

Mission

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

1. Provide quality education to prepare nationally competitive undergraduate students for a successful career 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 Civil Engineering program are expected within a few years of graduation to:

1. Solve current and emerging problems in civil and environmental infrastructure.
2. Conduct sustainable engineering design incorporating diverse perspectives to improve quality of life.
3. Engage in ethical and professional practices, realizing the broader societal implications of civil engineering.
4. Serve the profession through collaborative work, leadership roles, professional licensure, advanced degrees, and lifelong learning.

A Flexible Curriculum

First year civil engineering students at NDSU begin their education with fundamental courses in English, chemistry, math and an introduction to the engineering sciences. Second-year courses become more specific with an emphasis in surveying, math, physics and engineering science courses. The third-year student previews the specialization areas of civil engineering. These are (1) geotechnical, (2) structural, (3) transportation, (4) water resources and (5) environmental engineering. The senior year continues to require certain courses but also provides for 12 hours of technical electives and a senior design project. The technical electives allow the student to take additional courses in those areas of civil engineering in which he or she intends to practice professionally. Currently, there are 42 civil engineering courses from which the student may choose.

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, laboratories for geotechnical engineering and civil engineering materials, and several state-of-the-art research laboratories.

Student Organizations

Students participate in several professional student organizations in the department, which helps them develop leadership skills and the ability to work in teams. The NDSU American Society of Civil Engineers (ASCE) Steel Bridge Team has won six national championships, more than any school in the country. The NDSU American Water Works Association (AWWA) and the Water Environment Federation (WEF) student chapter has won 2 national design competitions and a number of regional and state competitions. Other organizations have also won national and regional awards.

Preparation

High school students who wish to prepare for some phase of engineering at the college level should attempt to complete the following high school credits: one unit of physics, four units of mathematics and one unit of chemistry. Incoming freshmen prepared to enroll in calculus frequently complete their civil engineering degree in four years. Students who have studied two years of pre-engineering at another institution can normally complete the civil engineering degree in two additional years.

Scholarships and Financial Aid

The Department of Civil and Environmental Engineering awards Solien, Vernon L. and Ruth Scholarship Endowment, Dr. Edwin Wetterstrom Scholarship, Moore Engineering Inc. Scholarship Endowment, Nelson, Donald Memorial Scholarship, Traynor, Duane Civil Engineering Scholarship, and many other scholarships. The scholarship awards range from $500 to $10,000. The Institute of Transportation Engineers (ITE) and ASCE student chapters recognize students who are active in their respective organizations. Other forms of financial aid are available through the Office of Financial Aid and Scholarships.

Career Opportunities

NDSU civil engineers are widely regarded as hands-on, can-do, project-ready graduates, who are very successful in finding excellent jobs. Our students are highly sought for internships and coops, with most students having completed multiple work experiences. Most 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. Civil 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.

Job placement of recent NDSU civil engineering graduates indicates a variety of work experience. About 40 percent of the graduates have gone to work for consulting engineering firms and another 40 percent with city, state and federal government. The remainder are employed by industry, contractors and the military or have gone to graduate school at NDSU or other universities. Most graduates are involved in more than one type of civil engineering activity. Some students accept jobs in which they are not involved in a specific civil engineering activity but use their engineering background in other activities. Job placement of graduates seeking employment has recently been 100 percent. The starting annual salaries accepted by recent civil engineering graduates were between $46,000 and $68,000 (salary median is $52,000).

Civil Engineering Plan of Study

Please note this is a sample plan of study 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. Students are encouraged to work with their academic advisor on a regular basis to review degree progress and customize an individual plan of study.

Freshman

Fall	Credits	Spring	Credits
CHEM 121 General Chemistry I	3	CE 111 Introduction to Civil Engineering	2
CHEM 121L General Chemistry I Laboratory	1	CHEM 122 General Chemistry II	3
ENGL 110 College Composition I	4	CHEM 122L General Chemistry II Laboratory	1
ENGL 120 College Composition II	3	COMM 110 Fundamentals of Public Speaking	3
MATH 165 Calculus I	4	MATH 166 Calculus II	4
Gen Ed Humanities & Fine Arts	3	ME 221 Engineering Mechanics I	3
	18		**16**

Sophomore

Fall	Credits	Spring	Credits
CE 204 Surveying	4	IME 460 Evaluation of Engineering Data	3
CE 212 Civil Engineering Graphic Communications	3	MATH 266 Introduction to Differential Equations	3
GEOL 105 Physical Geology	3	ME 223 Mechanics of Materials	3
MATH 128 (129) Introduction to Linear Algebra	1	PHYS 252 University Physics II	4
MATH 259 (265) Multivariate Calculus	3	Gen Ed Wellness	2
ME 222 Engineering Mechanics II	3		
	17		**15**

Junior

Fall	Credits	Spring	Credits
CE 309 Fluid Mechanics	3	CE 303 Civil Engineering Materials	2
CE 316 Soil Mechanics	3	CE 303L Civil Engineering Materials Laboratory	1
ENGL 321 Writing in the Technical Professions	3	CE 343 Structural Engineering and Analysis	4
ENGR 402 Engineering Ethics and Social Responsibility	1	CE 370 Introduction to Environmental Engineering	3
ME 350 Thermodynamics and Heat Transfer	3	CE 371 Environmental Engineering Laboratory	1
ENGR 311 History of Technology in America	3	CE 408 Water Resources and Supply	3
		CE 418 Transportation Engineering	4
	16		**18**

Senior

Fall	Credits	Spring	Credits
CE 310 Fluid Mechanics Laboratory	1	CE 483 Contracts and Specifications	3
CE 404 Reinforced Concrete	3	CE 489 Senior Design	3
CE 444 Structural Steel Design	3	IME 440 Engineering Economy	2
ENGR 312 Impact of Tech on Society	3	Technical Elective	3
Gen Ed Social & Behavioral Sciences	3	Technical Elective	3
Technical Elective	2	Technical Elective	2
Technical Elective	2		
	17		**16**

Total Credits: 133

View NDSU equivalencies of transfer courses at: www.ndsu.edu/transfer/equivalencies

For Further Information

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