

Construction Management

Department Information

- **Department Web Site:**
www.ndsu.edu/ccee/ (<http://www.ndsu.edu/ccee/>)
- **Credential Offered:**
B.S.Cons.M.
- **Official Program Curriculum:**
catalog.ndsu.edu/undergraduate/program-curriculum/construction-management/ (<http://catalog.ndsu.edu/undergraduate/program-curriculum/construction-management/>)

Construction Management is one of the four undergraduate programs in the Department of Civil, Construction and Environmental Engineering. The vision of the department is to impact people and communities through creation of globally relevant knowledge, innovators and future opportunity builders. We dare to change the world: we educate students to become global leaders in our field; we solve existing and emerging challenges of the world through innovation and research excellence; we integrate the complexities of design, management, and practice to solve societal problems and create opportunities; and we serve all people and communities in North Dakota and beyond.

The construction industry is one of the largest industries in the United States. It accounts for nearly 8 percent of the nation's gross national product and employs millions of people. The industry is divided into four sectors including residential building construction, industrial construction, commercial building construction, and heavy civil construction. The Construction Management program prepares nationally competitive students for successful careers in the construction industry.

THE PROGRAM

Construction management is a combination of technology, construction techniques, and management to meet the needs of the rapidly growing construction industry. Construction management studies less math and engineering concepts than construction engineering, but focuses more on business related courses. The program is designed to prepare students for the art of achieving maximum profit by efficient use of people, machines, materials and other resources to complete a construction project on time and to the satisfaction of the owner. A meld of engineering, construction, management and business gives the student a background and understanding of a management point of view in the construction industry. The program leading to Bachelor of Science in Construction Management degree is accredited by the American Council for Construction Education (<https://www.acce-hq.org/>) (ACCE).

A minor in Business Administration offered by the College of Business is required for all B.S. in Construction Management students. Students are required to have a minimum cumulative GPA of 2.50 to be admitted into the minor program. A minor in Business Administration requires a minimum GPA of 2.50 in the courses that satisfy the minor. In addition, a cumulative GPA of 2.50 overall is required to graduate with a Bachelor of Science in Construction Management degree.

PROGRAM OBJECTIVES

1. Provide construction students the basic skills necessary to plan, organize, and control resources to manage the overall construction process.
2. Provide construction students the technical knowledge and problem solving skills for a career in construction.
3. Provide construction students the knowledge and skills necessary to identify, define, and compare design alternatives.
4. Provide construction students necessary communication skills for the successful practice of the construction profession.
5. Provide construction students the professional opportunities and skills to pursue lifelong learning within the broader societal context of the construction profession.

The Program Objectives are further connected to the Program Learning Outcomes.

Program LEARNING OUTCOMES

The Construction Management program has adopted the 20 Student Learning Outcomes (SLOs) defined by ACCE as its Student Learning Outcomes. Upon graduation from the Construction Management program, graduates shall be able to:

1. Create written communications appropriate to the construction discipline.
2. Create oral presentations appropriate to the construction discipline.
3. Create a construction project safety plan.
4. Create construction project cost estimates.
5. Create construction project schedules.
6. Analyze professional decisions based on ethical principles.
7. Analyze construction documents for planning and management of construction processes.
8. Analyze methods, materials, and equipment used to construct projects.

9. Apply construction management skills as a member of a multi-disciplinary team.
10. Apply electronic-based technology to manage the construction process.
11. Apply basic surveying techniques for construction layout and control.
12. Understand different methods of project delivery and the roles and responsibilities of all constituencies involved in the design and construction process.
13. Understand construction risk management.
14. Understand construction accounting and cost control.
15. Understand construction quality assurance and control.
16. Understand construction project control processes.
17. Understand the legal implications of contract, common, and regulatory law to manage a construction project.
18. Understand the basic principles of sustainable construction.
19. Understand the basic principles of structural behavior.
20. Understand the basic principles of mechanical, electrical and piping systems.

CURRICULUM

First year construction management students at NDSU begin their education with fundamental courses in English, chemistry, math and an introduction to the construction and economics basics. Second year courses become more specific with an emphasis in surveying, physics and construction science and methods courses. Third year courses reflect the key areas of construction management along with business fundamentals. The senior year continues key construction management courses but also provides for 9 hours of business electives and a senior capstone project.

4+1 PROGRAM

The BSCM + MCM (4+1) program provide the opportunities for current students in the Construction Management program to pursue the Master of Construction Management (MCM) offered by the department. Students in the Construction Management program have an option to obtain a Master's degree through the 4+1 accelerated BSCM + MCM program, which requires at least a total of 30 semester credits. Up to 9 credits (three courses) from the Construction Management BS program can be double counted to the MCM program. However, these courses must be taken in the 600 or 700 level. In that sense, the interested students could accelerate the master's study by shortening three courses, so that they could complete the remaining 21 credits and graduate in one year.

A separate application to the 4+1 programs is required. Applicants could apply their admissions at their junior year (having accumulated more than 60 credits) with an average accumulative GPA above 3.5. The review procedure for applications will follow the existing policy of master's graduate student admissions.

Application procedure:

- Interested and eligible students must submit a Combined/Accelerated Program Degree Program Declaration (<https://www.ndsu.edu/fileadmin/facultysenate/ucc/accelerated-programs.pdf>) form to the department office.
- Next, the student's academic advisor will evaluate the substitution of the graduate level courses into the undergraduate program, followed by the final review and approval from the Department Chair. A maximum of 9 graduate student credits* may be applied to the undergraduate degree.
- After receiving the necessary approvals noted above, the student will submit this form to the Graduate College and formally apply for admission to the graduate program.
- All admissions to the Graduate College will be conditional. The minimum condition is completion of the bachelor's degree prior to full standing in master's program, and maintaining a 3.0 cumulative GPA in their graduate classes.
- No undergraduate course may be counted toward a master's degree.
- Students entering the master's degree with a bachelor's degree in hand may not use courses earned as part of the bachelor's program for master's requirements, even if those courses were graduate level courses.
- Students must meet all of the requirements that would ordinarily be expected of those enrolled in the MCM program.

The graduate-level courses** that can be taken:

- CM&E 605: Construction Support Operations (instead of CM&E 405: Construction Support Operations)
- CM&E 603: Scheduling and Project Control (instead of CM&E 403: Scheduling and Project Control)
- CM&E 715: Construction Specifications and Contracts (instead of CM&E 315: Specifications and Contracts)

* Graduate tuition will be assessed for graduate credits approved for double-counting toward requirements for both undergraduate and graduate programs of study. Double-counted graduate credits count toward totals for financial aid, but are not covered under the tuition cap. Mandatory Student fees, however, are capped at 12 credits, regardless of program.

** Note: A substitution form is required for the 600/700-level courses to officially apply to the BS degree. This is submitted after they have enrolled in the class(es).

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. Many of them are licensed as a Professional Engineer (PE) or Certified Professional Contractor (CPC). In addition, the department has many adjunct faculty members who worked or are currently working in the industry.

FACILITIES

The department has excellent laboratory facilities for undergraduate education across all civil, environmental, and construction areas, including the teaching laboratories for civil engineering materials, construction management and engineering, environmental engineering, geotechnical engineering, structural engineering, transportation engineering, and water resources engineering. Students also have access to computer clusters and many state-of-the-art research laboratories. The program has the most updated modern teaching and research equipment such as GPS units, robotic total stations, drones, and VR units.

STUDENT ORGANIZATIONS

Students participate in many professional departmental student organizations in the department, which helps them develop leadership and teamwork skills. The major student organizations include: American Railway Engineering and Maintenance-of-Way Association (AREMA), American Society of Civil Engineers (ASCE), American Water Works Association (AWWA), Associated General Contractors (AGC), Institute of Transportation Engineers (ITE), Materials Research Society (MRS), National Association of Homebuilders (NAHB), Sigma Lambda Chi, and Water Environment Federation (WEF), as well as Steel Bridge, Concrete Canoe, Associated Schools of Construction and Residential Construction Management, GeoWall, and Quiz Bowl competition teams. Students may also participate in a number of student organizations within the College of Engineering, including American Indian Science and Engineering Society (AISES), Engineers Without Borders (EWB), Grand Challenge Scholars of NDSU, Habitat for Humanity, National Society of Black Engineers (NSBE), and Society of Women Engineers (SWE). The student organizations have won a number of national and regional awards.

PREPARATION

High school students who wish to prepare for some courses at the college level should attempt to complete the four units of high school mathematics. Incoming freshmen prepared to enroll in calculus frequently complete their construction management degree in four years. Transfer students who have studied two years of construction related courses at another institution typically complete the construction management degree in two additional years.

SCHOLARSHIP AND FINANCIAL AID

The department awards numerous scholarships each year, which mostly range from \$500 to \$10,000. The AGC of North Dakota and the Fargo/Moorhead Home Builders Care Foundation (a charitable arm of the Home Builders Association of Fargo-Moorhead) offer annual scholarships to incoming freshman and outstanding existing students. In addition, many other scholarships, such as Cossette Construction Management and Engineering Scholarship, Excellence in Construction Safety Scholarship and Interstates Construction Management and Engineering Scholarship, are available to students. Students should check with the department for more information. Other forms of financial aid are available through the Office of Financial Aid and Scholarships.

CAREER OPPORTUNITIES

Construction management graduates are in high demand after graduation by contractors in all types of construction, from general contractors to specialty contractors. Positions available include superintendent, project manager, and construction executive. Starting salary has been between \$50,000 and \$80,000 in the recent years. Construction management students find summer internships or employment in the construction industry.