

# Construction Engineering

## Construction Engineering Major

Construction Engineering involves the planning, design, and management of construction facilities, such as highways, bridges, airports, railroads, buildings, dams, and reservoirs. The construction of such projects requires the knowledge of engineering, management, economics, and business. Construction Engineering is differentiated from Construction Management from the standpoint of the use of math, science, and engineering to design projects and processes and analyze problems. Construction Engineering is involved in a variety of construction disciplines, including: commercial, residential, transportation, and infrastructure systems. Construction Engineers are also involved in the engineering design of temporary structures, cost estimating, planning and scheduling, material procurement, selection of equipment, and cost control. Due to their diverse skills, there is a very high demand for Construction Engineers.

The Department of Construction Management and Engineering offers a Bachelor of Science degree in Construction Engineering which offers a blend of engineering and construction courses. The program is designed for those who want to work in the construction industry and enjoy the status of a professional engineer. A thorough knowledge of the physical sciences, math, and engineering is developed during the first two years followed by construction management and engineering courses. The technical side of the program is balanced with requirements in writing, humanities, social science, and communications. The Bachelor of Science degree in Construction Engineering is accredited by the Engineering Accreditation Commission of the ABET (<http://www.abet.org>)

## Educational Objectives

The Educational Objectives of the Construction Engineering Degree Program describe the career and professional accomplishments that we expect our graduates to achieve early in their careers. Within the first few (3-5) years after graduation, we expect our alumni:

- To maintain a sustained program of continuing education and life-long learning with a focus on contemporary issues.
- To be productive construction engineers and/or construction managers who are pursuing or have attained professional registration.
- To be effective communicators who work on multidisciplinary teams.
- To be engaged engineering professionals who are aware of and comprehend the ethical, social, environmental, and economic impacts of engineering solutions.
- To be engaged citizens who become involved and seek leadership roles in professional societies and community organizations.

## Major Requirements

### Major: Construction Engineering

Degree Type: B.S.Cons.E.

Required Degree Credits to Graduate: 131

## General Education Requirements

### First Year Experience (F):

UNIV 189	Skills For Academic Success (Students transferring in 24 or more credits do not need to take UNIV 189.)	1
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### Communication (C):

ENGL 110	College Composition I	3
ENGL 120	College Composition II	3
ENGL 320 or ENGL 321	Business and Professional Writing or Writing in the Technical Professions	3
COMM 110	Fundamentals of Public Speaking	3

### Quantitative Reasoning (R):

MATH 165	Calculus I	4
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### Science & Technology (S):

CHEM 121 & 121L	General Chemistry I and General Chemistry I Laboratory	4
CHEM 122	General Chemistry II	3
GEOL 105 or GEOL 106	Physical Geology or The Earth Through Time	3

**Humanities & Fine Arts (A): Select from current general education list** 6

### Social & Behavioral Sciences (B):

ECON 105	Elements of Economics	3
	Select from current general education list	3

**Wellness (W): Select from current general education list** 2

**Cultural Diversity (D): Select from current general education list**

### Global Perspectives (G):

ECON 105	Elements of Economics	3
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Total Credits 41

## major requirements

**General Education Requirements** 40

### Construction Engineering Core Requirements

CM&E 111	Introduction to Construction Management and Engineering	1
CM&E 200	Construction Documents and Codes	3
CM&E 204	Construction Surveying	3
CM&E 212	Construction Graphic Communications	3
CM&E 240	Financial Cost Concepts for Construction Managers	3
CM&E 301	Construction Technology and Equipment	3
CM&E 305	Pre-Construction Management	3
CM&E 315	Specifications and Contracts	3
CM&E 380	Construction Estimating: Quantities and Costs	3
CM&E 403	Scheduling and Project Control	3
CM&E 405	Construction Support Operations	3
CM&E 489	Construction Design Capstone	3

### CE Courses:

CE 303 & 303L	Civil Engineering Materials and Civil Engineering Materials Laboratory	3
CE 309	Fluid Mechanics	3
CE 316	Soil Mechanics	3
CE 343	Structural Engineering and Analysis	4

CE 400 Level Courses: Select 12 credits from the following:		12
CM&E 465	Bridge Engineering and Management	
CM&E 475	Design of Site Erosion Control	
CE 404	Reinforced Concrete	
CE 408	Water Resources and Supply	
CE 411	Design of Pre-stressed Concrete	
CE 417	Slope Stability and Retaining Walls	
CE 419	Pavement Design	
CE 421	Open Channel Flow	
CE 430	Timber and Form Design	
CE 441	Finite Element Analysis	
CE 444	Structural Steel Design	
CE 461	Foundation Engineering	
CE 462	Designing with Geosynthetics	
CE 478	Water Quality Management	
ME Courses Required:		
ME 221	Engineering Mechanics I	3
ME 222	Engineering Mechanics II	3
ME 223	Mechanics of Materials	3
Math Courses Required:		
MATH 128	Introduction to Linear Algebra	1
MATH 166	Calculus II	4
MATH 259	Multivariate Calculus	3
MATH 266	Introduction to Differential Equations	3
Additional Courses:		
BUSN 431	Business Law I-Contracts, Property and Torts	3
ENGR 402	Engineering Ethics and Social Responsibility	1
PHYS 252	University Physics II	4
STAT 330	Introductory Statistics	3
Total Credits		131

## Degree Requirements and Notes

- A student must complete at least 60 semester credits of professional level course work in his/her program while in residence and enrolled in the college. Students transferring into the college from programs with professional accreditation are exempt from this residency requirement but are subject to the residency requirement of NDSU.
- A 2.50 cumulative GPA is required for transfer students to be admitted to the B.S. in construction engineering program.