

# 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 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 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
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General Education Elective	3
<b>Wellness (W): Select from current general education list</b>	<b>2</b>
<b>Cultural Diversity (D): Select from current general education list</b>	
<b>Global Perspectives (G):</b>	
ECON 105 Elements of Economics	3
<b>Total Credits</b>	<b>41</b>

## major requirements

<b>General Education Requirements</b>	<b>40</b>
<b>Construction Engineering Core Requirements</b>	
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 Civil Engineering Materials	3
& 303L and Civil Engineering Materials Laboratory	
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
<b>Total Credits</b>		<b>131</b>

### 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 minimum 2.50 cumulative GPA is required for transfer students to be admitted to the B.S. in construction engineering program.