Civil Engineering

Department Information

- **Department Location:**
  Civil & Industrial Engineering
- **Department Phone:**
  701-231-7244
- **Department Web Site:**
  www.ndsu.edu/cee/ (http://www.ndsu.edu/cee/)
- **Credential Offered:**
  B.S.C.E.
- **Plan Of Study Sample:**
  bulletin.ndsu.edu/programs-study/undergraduate/civil-engineering/#planofstudytext (http://bulletin.ndsu.edu/programs-study/undergraduate/civil-engineering/#planofstudytext)

Major Requirements

Major: Civil Engineering

Degree Type: B.S.C.E.
Minimum Credits Required for Degree: 132

University Degree Requirements

1. Satisfactory completion of all requirements of the curriculum in which one is enrolled.
2. Earn a minimum total of 120 credits in approved coursework. Some academic programs exceed this minimum.
3. Satisfactory completion of the general education requirements as specified by the university.
4. A minimum institutional GPA of 2.00 based on work taken at NDSU.
5. At least 36 credits presented for graduation must be in courses numbered 300 or higher.
6. Transfer Students: Must earn a minimum of 60 credits from a baccalaureate-degree granting or professional institution.
   a. Of these 60, at least 36 must be NDSU resident credits as defined in #7.
   b. Within the 36 resident credits, a minimum of 15 must be in courses numbered 300 or higher and 15 credits in the major field of study.
7. At least 36 credits must be NDSU resident credits. Resident credits include credits registered and paid for at NDSU.

For complete information, please refer to the Degree and Graduation Requirements (http://catalog.ndsu.edu/academic-policies/undergraduate-policies/degree-and-graduation/) section of this Bulletin.

University General Education Requirements

Code	Title	Credits
Communication (C)		**12**
ENGL 110	College Composition I	
ENGL 120	College Composition II	
COMM 110	Fundamentals of Public Speaking	
Upper Division Writing †		
Quantitative Reasoning (R) †		**3**
Science and Technology (S) †		**10**
Humanities and Fine Arts (A) †		**6**
Social and Behavioral Sciences (B) †		**6**
Wellness (W) †		**2**
Cultural Diversity (D) *†		
Global Perspectives (G) *†		
Total Credits		**39**

* May be satisfied by completing courses in another General Education category.

† General education courses may be used to satisfy requirements for both general education and the major, minor, and program emphases, where applicable. Students should carefully review major requirements to determine if specific courses can also satisfy these general education categories.

- A list of university approved general education courses and administrative policies are available here (http://catalog.ndsu.edu/academic-policies/undergraduate-policies/general-education/#genedcoursestext).

Major Requirements

Code	Title	Credits
Civil Engineering Core Requirements		
CE 111	Introduction to Civil Engineering	1
CE 112	Computer Applications in Civil Engineering	1
CE 204	Surveying	3
CE 212	Civil Engineering Graphic Communications	3
CE 303	Civil Engineering Materials	2
CE 303L	Civil Engineering Materials Laboratory	1
CE 309	Fluid Mechanics	3
CE 310	Fluid Mechanics Laboratory	1
CE 316	Soil Mechanics	3
CE 343	Structural Engineering and Analysis	4
CE 370	Introduction to Environmental Engineering	3
CE 371	Environmental Engineering Laboratory	1
CE 404	Reinforced Concrete	3
CE 408	Water Resources and Supply	3
CE 418	Transportation Engineering	4
CE 444	Structural Steel Design	3
CE 483	Contracts and Specifications	3
CE 489	Senior Design	3
MATH Courses Required: [1]		
MATH 128	Introduction to Linear Algebra	1
MATH 165	Calculus I (May satisfy general education category R)	4
MATH 166	Calculus II	4
MATH 259	Multivariate Calculus	3
MATH 266	Introduction to Differential Equations	3
Other Required Courses :		
CHEM 121 & 121L	General Chemistry I and General Chemistry I Laboratory (May satisfy general education category S)	4
CHEM 122 & 122L	General Chemistry II and General Chemistry II Laboratory (May satisfy general education category S)	4
ENGR 402	Engineering Ethics and Social Responsibility	1
ENGR 311	History of Technology in America (May satisfy general education category A)	3
ENGR 312	Impact of Technology on Society (May satisfy general education category B)	3
ENGL 321	Writing in the Technical Professions (May satisfy general education category C)	3
GEOL 105	Physical Geology (May satisfy general education category S and G)	3
IME 440	Engineering Economy	2
IME 460	Evaluation of Engineering Data	3
ME 221	Engineering Mechanics I [1]	3
ME 222	Engineering Mechanics II [1]	3
ME 223	Mechanics of Materials [1]	3
ME 350	Thermodynamics and Heat Transfer [2]	3
PHYS 252	University Physics II	4
Technical Electives Required: Select 12 credits from the following:		**12**
Structures:		

CE 411	Design of Pre-stressed Concrete (Design Credits 1.0)
CE 425	Bridge Evaluation and Rehabilitation (Design Credits 1.5)
CE 430	Timber and Form Design (Design Credits 1.5)
CE 441	Finite Element Analysis (Design Credits 1.0)
CE 445	Advanced Steel Design (Design Credits 1.0)
CE 446	Basic Dynamics of Structures (Design Credits 1.0)
CE 447	Stability of Structures (Design Credits 1.5)
CM&E 465	Bridge Engineering and Management (Design Credits 1.5)
Water Resources:	
CE 421	Open Channel Flow (Design Credits 1.5)
CE 474	Groundwater Sustainability Design (Design Credits 1.5)
CE 476	Watershed Modeling (Design Credits 1.5)
CE 477	Applied Hydrology (Design Credits 1.5)
Environmental:	
CE 410	Water and Wastewater Engineering (Design Credits 1.5)
CE 471	Environmental Nanotechnology (Design Credits 1.5)
CE 472	Solid Waste Management (Design Credits 1.0)
CE 473	Air Pollution (Design Credits 1.5)
CE 478	Water Quality Management (Design Credits 1.5)
CE 479	Advanced Water and Wastewater Treatment (Design Credits 1.5)
CE 499	Special Topics (Design Credits 1.5)
Transportation:	
CE 419	Pavement Design (Design Credits 1.5)
CE 454	Geometric Highway Design (Design Credits 2.0)
CE 455	Airport Planning and Design (Design Credits 1.0)
CE 456	Railroad Planning and Design (Design Credits 1.5)
CE 457	Pavement Management Systems (Design Credits 1.0)
CE 458	Bituminous Materials and Mix (Design Credits 1.5)
CE 499	Special Topics (Design Credits 1.0)
Geotechnical:	
CE 417	Slope Stability and Retaining Walls (Design Credits 1.5)
CE 461	Foundation Engineering (Design Credits 1.5)
CE 462	Designing with Geosynthetics (Design Credits 1.0)
CE 463	Geotechnical Earthquake Engineering (Design Credits 1.5)
CE 464	Advanced Soil Mechanics (Design Credits 1.0)
Advanced Materials:	
CE 486	Nanotechnology and Nanomaterials (Design Credits 0.0)
CE 491	Seminar
CE 493	Undergraduate Research
Total Credits	**114**

[1] No grades less than a "C" are accepted in any of the math courses, as well as ME 221 Engineering Mechanics I, ME 222 Engineering Mechanics II, and ME 223 Mechanics of Materials for this curriculum.

[2] Use ME 351 as an alternate when ME 350 is not available for students due to scheduling.

Degree Requirements and Notes

- **Students must complete courses in a minimum of three technical areas with a minimum of 6 credits in design for a minimum total of 12 technical electives.**
- Transfer students are required to take ENGR 311 History of Technology in America or ENGR 312 Impact of Technology on Society regardless of General Education completion.

Note: *Department permission required for graduate level courses. Credit may be earned only at the undergraduate level. Department permission is also required for some undergraduate courses. There are specific prerequisites and grade requirements to be allowed to take certain courses.*