

Civil Engineering Major

Major Requirements

Degree Type: B.S.C.E.
Minimum Credits Required: 130

University Degree Requirements

For complete details on these and other university degree requirements, refer to the Degree and Graduation Requirements (<http://catalog.ndsu.edu/academic-policies/undergraduate-policies/degree-and-graduation/>) section in the University Catalog.

1. Minimum of 120 semester credits (some programs may exceed this minimum).
2. Complete the University General Education requirements.
3. Minimum institutional GPA of 2.00 based on work taken at NDSU.
4. Minimum of 30 credits in resident at NDSU.
5. Minimum of 36 upper level credits (courses numbered 300 or higher).
6. Students with transfer credit must meet the NDSU 30 credits in residence (#4). Of these 30 credits in residence, a minimum of 15 credits must be in courses numbered 300 or above, and 15 credits must be in the student's declared major curricula.

University General Education Requirements

A list of university approved general education courses along with the administrative policies governing the requirement and the categories is available here (<http://catalog.ndsu.edu/academic-policies/undergraduate-policies/general-education/>).

Code	Title	Credits
Category C: Communication		12
Category R: Quantitative Reasoning		3
Category S: Science and Technology		10
Category A: Humanities and Fine Arts		6
Category B: Social and Behavioral Sciences		6
Category W: Wellness		2
Category D: Cultural Diversity		
Category G: Global Perspectives		
Category L: Digital Literacy		
Total Credits		39

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	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	4
CHEM 122 & 122L	General Chemistry II and General Chemistry II Laboratory	4
ENGL 321	Writing in the Technical Professions	3
ENGR 311	History of Technology	3
ENGR 327	Ethics, Engineering, and Technology	3
GEOL 105	Physical Geology	3
IME 440	Engineering Economy	3
IME 460	Evaluation of Engineering Data	3
ME 221	Engineering Mechanics I	3
ME 222	Engineering Mechanics II	3
ME 223	Mechanics of Materials	3
ME 350 or ME 351	Thermodynamics and Heat Transfer Thermodynamics I	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 and Hazardous Waste Management (Design Credits 1.5)	
ENVE 473	Air Pollution	
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	

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¹ No grades less than a "C" are accepted in any of the math courses.

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.

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.