Civil Engineering

Department Information

- **Department Location:**
  Civil & Industrial Engineering
- **Department Phone:**
  701-231-7244
- **Department Web Site:**
  www.ndsu.edu/ce/
- **Degrees Offered:**
  B.S.C.E.
- **Plan Of Study Sample:**
  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:** 133

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 specific 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 number 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 residence 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. Residence credits include credits registered and paid for at NDSU.

For complete information, please refer to the Degree and Graduation Requirements (http://bulletin.ndsu.edu/past-bulletin-archive/2018-19/academic-policies/undergraduate-policies/degree-and-graduation) section of this Bulletin.

University General Education Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
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<tr>
<td>ENGL 120</td>
<td>College Composition II</td>
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<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
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<tr>
<td></td>
<td>Upper Division Writing †</td>
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<tr>
<td></td>
<td>Quantitative Reasoning (R) †</td>
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<tr>
<td></td>
<td>Science and Technology (S) †</td>
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<td></td>
<td>Humanities and Fine Arts (A) †</td>
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<td>Social and Behavioral Sciences (B) †</td>
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<td>Wellness (W) †</td>
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<td></td>
<td>Cultural Diversity (D) †</td>
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<td></td>
<td>Global Perspectives (G) †</td>
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<td>Total Credits</td>
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</table>

* 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://bulletin.ndsu.edu/past-bulletin-archive/2018-19/academic-policies/undergraduate-policies/general-education/#genedcoursestext).

## Major Requirements

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

<table>
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<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CE 411</td>
<td>Design of Pre-stressed Concrete (Design Credits 1.0)</td>
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<tr>
<td>CE 425</td>
<td>Bridge Evaluation and Rehabilitation (Design Credits 1.5)</td>
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<td>CE 430</td>
<td>Timber and Form Design (Design Credits 1.5)</td>
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<td>CE 441</td>
<td>Finite Element Analysis (Design Credits 1.0)</td>
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<td>CE 445</td>
<td>Advanced Steel Design (Design Credits 1.0)</td>
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<td>Course</td>
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<tr>
<td>CE 446</td>
<td>Basic Dynamics of Structures</td>
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<td>CE 447</td>
<td>Stability of Structures</td>
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<tr>
<td>CM&amp;E 465</td>
<td>Bridge Engineering and Management</td>
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<td><strong>Water Resources:</strong></td>
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<tr>
<td>CE 421</td>
<td>Open Channel Flow</td>
<td>1.5</td>
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<tr>
<td>CE 476</td>
<td>Watershed Modeling</td>
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<td>CE 477</td>
<td>Applied Hydrology</td>
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<td><strong>Environmental:</strong></td>
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<td>CE 410</td>
<td>Water and Wastewater Engineering</td>
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<td>CE 471</td>
<td>Environmental Nanotechnology</td>
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<td>CE 472</td>
<td>Solid Waste Management</td>
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<td>CE 473</td>
<td>Air Pollution</td>
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<td>CE 478</td>
<td>Water Quality Management</td>
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<td>CE 479</td>
<td>Advanced Water and Wastewater Treatment</td>
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<td>CE 499</td>
<td>Special Topics</td>
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<td><strong>Transportation:</strong></td>
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<td>CE 419</td>
<td>Pavement Design</td>
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<td>CE 454</td>
<td>Geometric Highway Design</td>
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<td>CE 455</td>
<td>Airport Planning and Design</td>
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<td>CE 456</td>
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<td>CE 457</td>
<td>Pavement Management Systems</td>
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<td>CE 458</td>
<td>Bituminous Materials and Mix</td>
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<td>CE 499</td>
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<td><strong>Geotechnical:</strong></td>
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<td>CE 417</td>
<td>Slope Stability and Retaining Walls</td>
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<td>CE 461</td>
<td>Foundation Engineering</td>
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<td>CE 462</td>
<td>Designing with Geosynthetics</td>
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<td>CE 463</td>
<td>Geotechnical Earthquake Engineering</td>
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<td>CE 464</td>
<td>Advanced Soil Mechanics</td>
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<td><strong>Advanced Materials:</strong></td>
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<tr>
<td>CE 486</td>
<td>Nanotechnology and Nanomaterials</td>
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</table>

**Total Credits:** 115

* 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.

### 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.
- **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.