BSCiE in Civil Engineering

Degree Program Description

Civil engineers are responsible for design, construction, and operation of our public and private infrastructure, for protecting our natural resources, and for preserving the health and safety of the general public. Civil engineers are vital to our nation’s economic vitality as they provide infrastructure for safe, efficient, and sustainable transportation of people and goods. The curriculum includes fundamental coursework in math and basic sciences, specialized coursework covering the subdisciplines of structural engineering, transportation engineering, geotechnical engineering, environmental engineering, and water resources engineering, as well as general education courses in the humanities and social sciences. Graduates are well prepared to become licensed Professional Engineers. The BS degree in civil engineering is accredited by the Engineering Commission of ABET. Graduates are commonly employed by private firms that provide design and consulting services, by construction contractors that build our infrastructure, and by government agencies responsible for specific components of the nation’s infrastructure. Some graduates opt to further specialize within the civil engineering profession by pursuing graduate degrees.

Civil engineering, considered one of the oldest engineering disciplines, encompasses many specialties. The specialties include construction, environmental, geotechnical, structural, transportation, and water resources engineering. Many civil engineers hold supervisory or administrative positions, from supervisor of a construction site to city engineer. Others may work in design, construction, regulatory, research, or teaching.

Major Program Requirements

Students are introduced to Civil Engineering and professional engineering design practices in the CV_ENG 1000 course. Additional engineering topics also include basic computer and graphics courses. These are followed with basic engineering science courses, which ground the students in the fundamentals necessary for future course work and a sophomore design experience. Students are also required to complete one cultural awareness course which is selected from an approved list, created and maintained by the College of Engineering or which meets the Arts and Science (A&S) diversity requirement.

Civil Engineering topics courses in the junior year provide students with the basic fundamentals in the areas of environmental engineering, geotechnical engineering, hydrology/water resources, structural engineering, and transportation/traffic engineering. Many of these courses contain elements of civil engineering design. Bachelor of Science in Civil Engineering (BS Civil Engineering) requires that students earn a C- or better in the Civil Engineering core classes (CV_ENG 3010, CV_ENG 3100, CV_ENG 3200, CV_ENG 3300, CV_ENG 3312/CV_ENG 3313 (C-only required in class that serves as core requirement), CV_ENG 3400, CV_ENG 3600, CV_ENG 3700, CV_ENG 3702, CV_ENG 4980).

Civil Engineering Elective courses in the senior year enable students to either begin to specialize within or to maintain a broad educational background across the civil engineering discipline.

Design and communication skills are integrated throughout the curriculum culminating in a capstone design project, which is usually supplied by consultants or governmental agencies. This “final” course requires working in teams, making oral and written presentations, and completing a final design report. Oversight, interaction, and evaluation are provided by practicing engineers from industry and governmental organizations.

Students earning a Bachelor of Science in Civil Engineering are required to complete all University general education (http://catalog.missouri.edu/academicdegerequirements/generaleducationrequirements/), University undergraduate requirements (http://catalog.missouri.edu/academicdegerequirements/universityrequirements/), degree, and major requirements, including selected foundational courses, which may fulfill some University general education requirements. Over one-half of the course work for the degree is completed in engineering or professionally related courses.

Major Core Requirements

<table>
<thead>
<tr>
<th>Math</th>
<th>16</th>
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<tbody>
<tr>
<td>MATH 1500</td>
<td>Analytic Geometry and Calculus I</td>
</tr>
<tr>
<td>MATH 1700</td>
<td>Calculus II</td>
</tr>
<tr>
<td>MATH 2300</td>
<td>Calculus III</td>
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<tr>
<td>MATH 4100</td>
<td>Differential Equations</td>
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Basic Sciences | 17-18 |

| CHEM 1320  | College Chemistry I             | 4 |
| PHYSCS 2750| University Physics I            | 5 |
| PHYSCS 2760| University Physics II           | 5-6 |

or CHEM 1330  
& CHEM 2100  
  & Organic Chemistry I

Basic Science Elective | 3 |

Engineering Topics-General | 17 |

INFOTC 1040  
  Introduction to Problem Solving and Programming | 3 |

ENGINR 1100  
  Engineering Graphics Fundamentals | 2 |

ENGINR 1200  
  Statics and Elementary Strength of Materials | 3 |

ENGINR 2200  
  Intermediate Strength of Materials | 3 |

Engineering topics elective | 6 |

Select two of the following:

(a) ENGINR 2100  
  Circuit Theory for Engineers | 3-4 |

or BIOL_EN 4380  
  Applied Electronic Instrumentation |

(b) ENGINR 2300  
  Engineering Thermodynamics | 3 |

or CH_ENG 3261  
  Chemical Engineering Thermodynamics I |

(c) CV_ENG 2080  
  Introduction to Dynamics | 3 |

or MAE 2600  
  Dynamics |

Civil Engineering Topics

| CV_ENG 3010  | Decision Methods for Civil Engineering Design | 3 |
| CV_ENG 3100  | Fundamentals of Transportation Engineering | 4 |
| CV_ENG 3200  | Fundamentals of Environmental Engineering | 4 |
| CV_ENG 3300  | Structural Analysis I | 4 |
| CV_ENG 3312  | Reinforced Concrete Design | 3 |
| or CV_ENG 3313  | Structural Steel Design |
| CV_ENG 3400  | Fundamentals of Geotechnical Engineering | 4 |
| CV_ENG 3600  | Civil Engineering Materials | 4 |
| CV_ENG 3700  | Fluid Mechanics | 3 |
Accelerated BScie to MS

Students pursuing a degree in BScie in Civil Engineering have the option of accelerating into the MS in Civil Engineering. This will give students the opportunity to complete the BS and MS degree within a shorter amount of time versus completing each degree separately.

Students in the MS program, traditional or accelerated, are required to take a minimum of 30 hours (transportation area) or 31 hours of graduate credit beyond the bachelor's degree; in the accelerated program, up to 12 credit hours can be taken as part of their undergraduate degree and also counted towards the MS, requiring only an additional 18 or 19 credit hours after the bachelor's degree.

The requirements for the MS degree are the same as the traditional MS degree program (http://catalog.missouri.edu/collegeofengineering/civilengineering/ms-civil-engineering/).

Program structure

Total Credits Required for Graduation
- Total Undergraduate Credits: 125
- Total of Dual Credits: 12
- Total Graduate Credits: 30-31

Residency Requirements: one academic year as full time graduate student.

Core Courses required to complete MS (at least 15 must be 8000 level or above).

Admissions

The application deadline for the MS accelerated program will be March 1st for fall admission and October 1st for spring admission. Undergraduate seniors will be considered for the program, but depending on the number and level of courses taken, the length of their program may be extended. An individual plan of study will be developed for students applying later than the second semester of their junior year.

In order for a student to participate in the accelerated program they must:
- Have completed at least 90 credit hours towards a bachelor's degree.
- Maintain a minimum GPA of 3.0 by the end of their junior year.
- Identify a faculty member in the area of interest that can serve as graduate advisor.
- Meet admission criteria for the MS set by each program area within the department.

Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.