

CIVIL ENGINEERING, BS

Introduction

Please click here (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/college-engineering-design-computing/civil-engineering/>) to see Civil Engineering department information.

The objectives of the bachelor of science in civil engineering program are to produce graduates who:

- are able to perform the technical analyses and design tasks of entry-level civil engineers
- can successfully work toward professional engineering licensure
- communicate effectively, both orally and in writing
- understand the importance of leadership skills, team building and ethical practice
- value lifelong learning and improvement through graduate degrees or professional study
- appreciate the importance of community involvement and social contribution civil engineers are dedicated to improving our living environment

Civil engineering offers an interesting and challenging career in the design, construction, and maintenance of buildings and urban infrastructure; in transportation systems, including highways, airports, rapid transit lines, railroads, and harbor facilities; in the development of water resources, including reservoirs for storage, canals for irrigation, dams for power generation, stormwater management for drainage, groundwater recharge for contamination prevention, wastewater treatment for environmental protection, and water purification for drinking purposes; in the construction industry; including foundations, bridges, concrete and steel structures, in problems concerned with environmental preservation; and in the sustainable development of cities. In preparing for work in such a broad field, the civil engineering student studies mathematics, basic science, communication, social science and humanities, engineering science and civil engineering design. CU Denver's civil engineering graduates usually find their first professional employment with consulting engineering firms, government agencies and various industries.

Program Delivery

- This is an on-campus program.

Declaring This Major

- Click here (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/college-engineering-design-computing/#policiestext>) to go to information about declaring a major.

General Requirements

To earn a degree, students must satisfy all requirements in each of the areas below, in addition to their individual major requirements.

- CU Denver General Graduation Requirements (<http://catalog.ucdenver.edu/cu-denver/undergraduate/graduation/>)
- CU Denver Core Curriculum (<http://catalog.ucdenver.edu/cu-denver/undergraduate/graduation-undergraduate-core-requirements/#cudenvercorecurriculumtext>)

- College of Engineering, Design and Computing Graduation Requirements (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/college-engineering-design-computing/#graduationrequirements>)
- Click here (<http://catalog.ucdenver.edu/cu-denver/undergraduate/academic-policies-procedures/>) for information about Academic Policies

Program Requirements

1. Students must maintain a minimum 2.0 GPA in all courses applying to major requirements.
2. Students must maintain a minimum 2.0 GPA in all CVEN and CEMT courses attempted.
3. Complete a minimum of 32 semester hours in math, chemistry, and physics
4. Complete a minimum of 18 semester hours of design courses

Code	Title	Hours
Civil Engineering		
CVEN 1025	Civil Engineering Graphics and Computer Aided Design	3
CVEN 1067	Introduction to Civil Engineering	1
ENGR 1100 or CSCI 1410	Fundamentals of Computational Innovation Fundamentals of Computing	3
CEMT 2100	Construction Management Fundamentals	3
CVEN 2121	Analytical Mechanics I	3
CVEN 2214	Surveying for Engineering	1
CVEN 3111	Analytical Mechanics II	3
CVEN 3121	Mechanics of Materials	3
CVEN 3141	Introduction to Structural Materials	2
CVEN 3200	Computational Methods for Civil Engineers	3
CVEN 3313	Fluid Mechanics	3
CVEN 3323	Hydrosystems Engineering	3
CVEN 3401	Introduction to Environmental Engineering	3
CVEN 3505	Structural Analysis	3
CVEN 3602	Transportation Engineering	3
CVEN 3718	Geotechnical Engineering I	3
CVEN 4000	Senior Seminar	0
Design Courses		18
Required:		
CVEN 4067	Senior Design Projects	
Select five of the following:		
ENGR 1200	Fundamentals of Engineering Design Innovation	
CVEN 4426/5426	Pipe Network and Sewer Design	
CVEN 4427/5427	Storm Water System Design	
CVEN 4520/5520	Structural Engineering and the Ocean Environment	
CVEN 4565/5565	Timber Structure Design	
CVEN 4575	Structural Steel Design	
CVEN 4585	Reinforced Concrete Design	
CVEN 4590/5590	Design of Prestressed Concrete	

CVEN 4591/5591	Design of Composite Structures	
CVEN 4602/5602	Advanced Highway Design	
CVEN 4641/5641	Transit System Planning and Design	
CVEN 4650/5650	Urban Street Design	
CVEN 4738/5738	Foundation Design	
CVEN 5112	Structural Design Loads	
CVEN 5540	Masonry Design	
CVEN 5550	Highway Bridge Design	
CVEN 5575	Advanced Topics in Structural Steel Design	
CVEN 5585	Advanced Topics in Reinforced Concrete	
CVEN 5682	Pavement Design	
Mathematics		
MATH 1401	Calculus I	4
MATH 2411	Calculus II	4
MATH 2421	Calculus III	4
MATH 3191 & MATH 3200	Applied Linear Algebra and Elementary Differential Equations	4-6
or MATH 3195	Linear Algebra and Differential Equations	
CVEN 3611	Engineering Statistics	3
or MATH 3800	Probability and Statistics for Engineers	
Chemistry		
CHEM 2031 & CHEM 2038	General Chemistry I and General Chemistry Laboratory I ¹	5
or ENGR 1130	Chemistry for Engineers	
Physics		
PHYS 2311	General Physics I: Calculus-Based	4
PHYS 2321	Intro Experimental Phys Lab I	1
PHYS 2331	General Physics II: Calculus-Based	4
Other Courses		
Select one of the following:		3
CVEN 4025/5025	Autocad Civil 3d & Advanced Civil Engineering Graphics	
CVEN 4077	Engineering Economy	
CVEN 4087/5087	Engineering Contracts	
Technical Electives		9
Upper Division Technical Electives 6-9 credits ²		
Any CEMT or CVEN 4000+ level course		
CEMT 3100	Field Engineering and Management	
CEMT 3231	Construction Materials and Methods	
CVEN 4025/5025	Autocad Civil 3d & Advanced Civil Engineering Graphics	
CVEN 4077	Engineering Economy	
CVEN 4087/5087	Engineering Contracts	
CVEN 4381/5381	Introduction to Geographic Information Systems	
CVEN 4383/5383	GIS Analysis	

CVEN 4384	GIS Project Management	
CVEN 4385	GIS Relational Database Systems	
CVEN 4388	Geographic Information Systems for Transportation Infrastructure (GIS-T)	
CVEN 4592/5592	Computer-Aided Structural Analysis and Design	
CVEN 4612/5612	Traffic Impact Assessment	
CVEN 4621/5621	Highway Capacity Analysis	
CVEN 4622/5622	Traffic Operations and Control	
CVEN 4631/5631	Transport Modeling and Big Data	
CVEN 4633/5633	Sustainable Transportation Systems	
CVEN 4662/5662	Transportation System Safety	
CVEN 4800/5800	Special Topics	
ARCH 3130	Construction Practices: Material and Structural Systems	
ELEC 3030	Electric Circuits and Systems	
CHEM 3411	Organic Chemistry I	
CHEM 3421	Organic Chemistry II	
ENVS 3082	Energy and the Environment	
MECH 3012	Thermodynamics	
URPL 4000	Planning History and Theory	
<i>Lower Division Technical Electives 0-3 credits</i>		
CEMT 2300	Heavy Civil Construction and Equipment	
BIOL 2010	Organisms to Ecosystems (Gen Bio) ³	
BIOL 2020	Molecules to Cells (Gen Bio)	
CHEM 2061	General Chemistry II ³	
CSCI/ELEC 1510	Logic Design	
CSCI/ELEC 2132	Circuits and Electronics ³	
GEOL 1073	Physical Geology: Surface Processes ³	
PHYS 2711	Vibrations and Waves ³	
PHYS 2811	Modern Physics I ³	

CU Denver Core Curriculum

Select 24 Credits (<https://catalog.ucdenver.edu/cu-denver/undergraduate/graduation-undergraduate-core-requirements/>) 24

Total Hours**130-132**

¹ Students who take CHEM 2031 & CHEM 2038 to fulfill the chemistry requirement will need an additional semester hour to reach the 130 semester hours required for the degree.

² Any 4000-level or higher CVEN or CEMT courses. Other math, science or engineering courses may be allowed with advisor approval.

³ A maximum of one lower-division course (level 1000-2999) may be applied to electives.

Note

Up to two 5000-level CVEN courses taken at CU Denver for the bachelor of science in civil engineering can be applied to a CU Denver civil engineering master's degree if relevant to the student's master's degree emphasis as determined by the student's master's degree advisor.

To review the Degree Map for this program, please visit our website (<https://www.ucdenver.edu/student/advising/undergraduate/degree-maps/cedc/>).