CONSTRUCTION ENGINEERING AND MANAGEMENT, 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 construction engineering and management bachelor of science at CU Denver is a new type of degree that offers the rigor of engineering problem-solving and design, coupled with construction management courses. Students receive an innovative interdisciplinary education that combines coursework in engineering, construction management, business and architecture. Graduates will find exciting, well-paid careers in the expanding and interconnected industry of architecture, engineering and construction as it embraces new concepts like smart cities, connected infrastructure and evolving value propositions.

The construction engineering and management bachelor of science degree supports the new construction knowledge area within the fundamentals of engineering exam. The program includes a solid foundation of construction engineering and management courses, an engineering focus/specialty area, and select courses from business, architecture and engineering. All students will complete a construction capstone design course, and students are required to complete at least 12 weeks of a full-time internship within the architecture, engineering or construction industry or government agency.

Program Delivery
• This is an on-campus program.

Declaring This Major
• Click here (http://catalog.ucdenver.edu/cu-denver/undergraduate/records-registration/registration/declare-change-major-minor/) 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/general-graduation-requirements/)
• CU Denver Core Curriculum (http://catalog.ucdenver.edu/cu-denver/undergraduate/graduation-undergraduate-core-requirements/)
• College of Engineering, Design and Computing Graduation Requirements (http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/college-engineering-design-computing/#graduationrequirementstext)
• Click here (http://catalog.ucdenver.edu/cu-denver/undergraduate/academic-policies-procedures/) for information about Academic Policies

Program Requirements
• Students must maintain a minimum 2.0 GPA in all courses applying to major requirements.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CU Denver Core Curriculum</td>
<td>Select 24 credits</td>
<td>24</td>
</tr>
<tr>
<td>Architecture &amp; Business</td>
<td>Introduction to Business</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Building Systems I</td>
<td>3</td>
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<tr>
<td></td>
<td>Building Systems II</td>
<td>3</td>
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<tr>
<td></td>
<td>Introduction to Architecture</td>
<td>3</td>
</tr>
<tr>
<td>Engineering</td>
<td>CAD and Graphics for Mechanical Engineering</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Surveying for Construction and Engineering</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Fundamentals of Engineering Design Innovation</td>
<td>3</td>
</tr>
<tr>
<td>Construction</td>
<td>Introduction to Construction Management</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Introduction to Civil Engineering</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Construction Management Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Heavy Civil Construction and Equipment</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Field Engineering and Management</td>
<td>3</td>
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<tr>
<td></td>
<td>Construction Senior Capstone</td>
<td>3</td>
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<td></td>
<td>Construction Materials and Methods</td>
<td>3</td>
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<td>Construction Planning and Control</td>
<td>3</td>
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<td>Construction Cost Estimating</td>
<td>3</td>
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<td></td>
<td>Sustainable Construction</td>
<td>3</td>
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<td></td>
<td>Project Management Systems</td>
<td>3</td>
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<td></td>
<td>Building Information Modeling (BiM)</td>
<td>3</td>
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<tr>
<td></td>
<td>Construction Safety</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Internship (At least 3 months of internship (480 hours))</td>
<td>1</td>
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Engineering Specialty Science and Design
Select 15 credits CSCI, CVEN, ELEC or MECH. All courses must be from the same specialty. 1

Some examples of specialty course sequences are listed below

Computer Science Focus

<table>
<thead>
<tr>
<th>Title</th>
<th>Code</th>
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</thead>
<tbody>
<tr>
<td>Fundamentals of Computing</td>
<td>CSCI 1410</td>
</tr>
<tr>
<td>and Fundamentals of Computing Laboratory</td>
<td>CSCI 1411</td>
</tr>
<tr>
<td>Data Structures and Program Design</td>
<td>CSCI 2421</td>
</tr>
<tr>
<td>3 Additional CSCI courses</td>
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Electrical Focus

<table>
<thead>
<tr>
<th>Title</th>
<th>Code</th>
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</thead>
<tbody>
<tr>
<td>Circuit Analysis I</td>
<td>ELEC 2132</td>
</tr>
<tr>
<td>Circuit Analysis II</td>
<td>ELEC 2142</td>
</tr>
<tr>
<td>Energy Systems</td>
<td>ELEC 3164</td>
</tr>
<tr>
<td>Power Systems Analysis (Fullfills Design)</td>
<td>ELEC 4184</td>
</tr>
<tr>
<td>Additional ELEC course</td>
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</tbody>
</table>

Environmental Focus

<table>
<thead>
<tr>
<th>Title</th>
<th>Code</th>
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<tbody>
<tr>
<td>Fluid Mechanics</td>
<td>CVEN 3313</td>
</tr>
<tr>
<td>Hydrosystems Engineering</td>
<td>CVEN 3323</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
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<tr>
<td>CVEN 3401</td>
<td>Introduction to Environmental Engineering</td>
</tr>
<tr>
<td>CVEN 4426</td>
<td>Pipe Network and Sewer Design (Fullfills Design)</td>
</tr>
<tr>
<td>CVEN 4427</td>
<td>Storm Water System Design (Fullfills Design)</td>
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</tbody>
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**Mechanical Focus**

- MECH 2023 Statics
- MECH 2033 Dynamics
- MECH 3010 Elementary Numerical Methods and Programming
- MECH 3012 Thermodynamics
- MECH 3021 Introduction to Fluid Mechanics
- MECH 3042 Heat Transfer
- MECH 4142 Thermal Systems Design (Fullfills Design)

**Structural Focus**

- CVEN 2121 Analytical Mechanics I
- CVEN 3121 Mechanics of Materials
- CVEN 3141 Introduction to Structural Materials
- CVEN 3505 Structural Analysis
- CVEN 4575 Structural Steel Design (Fullfills Design) or CVEN 4585 Reinforced Concrete Design

**Transportation Focus**

- CVEN 3602 Transportation Engineering
- CVEN 4602 Advanced Highway Design (Fullfills Design)
- CVEN 4612 Traffic Impact Assessment
- CVEN 4621 Highway Capacity Analysis
- CVEN 4650 Urban Street Design (Fullfills Design)

**Math and Science**

- MATH 1401 Calculus I 4
- MATH 2411 Calculus II 4
- CHEM 2031 General Chemistry I 5
- CHEM 2038 General Chemistry Laboratory I 2
  & ENGR 1130 Chemistry for Engineers
- PHYS 2311 General Physics I: Calculus-Based 4
- PHYS 2321 Intro Experimental Phys Lab I 1

Select one of the following: 3

- CVEN 3611 Engineering Statistics
- MATH 2830 Introductory Statistics
- MATH 3800 Probability and Statistics for Engineers
- ELEC 3817 Engineering Probability and Statistics
- BANA 2010 Business Statistics

Select an additional 10 credits hours of math and science 2

- MATH 2421 Calculus III
- MATH 3191 Applied Linear Algebra
  & MATH 3200 and Elementary Differential Equations
  or MATH 3195 Linear Algebra and Differential Equations
- MATH 3301 Introduction to Optimization
- MATH 3382 Statistical Theory
- BIOL 2010 Organisms to Ecosystems (Gen Bio)
  & BIOL 2011 and Organisms to Ecosystems Lab (Gen Bio)
- BIOL 2020 Molecules to Cells (Gen Bio)
  & CHEM 2068 and General Chemistry Laboratory II
- CHEM 2061 General Chemistry II
- GEOL 1073 Physical Geology: Surface Processes
  & GEOL 1074 and Physical Geology: Surface Processes Laboratory
- PHYS 2331 General Physics II: Calculus-Based
  & PHYS 2341 and Intro Experimental Phys Lab II
- Elective 3

Any course listed above in Engineering Specialty Science and Design or Math and Science

Or other course in math, science, architecture, business, engineering, construction or technical communication.

Some options are:

- ACCT 2200 Financial Accounting and Financial Statement Analysis
- ARCH 2230 Architectural History I
- ARCH 3340 Theory of Structures I
- ARCH 3705 Human Centered Design, Innovation and Prototyping
- ARCH 4340 Theory of Structures II
- BIOL 3411 Principles of Ecology
- COMM 2050 Business and Professional Speaking
- BLAW 3050 Business Law and Ethics
- COMM 2050 Business and Professional Speaking
- CVEN 4025 Autocad Civil 3d & Advanced Civil Engineering Graphics
- CVEN 4077 Engineering Economy
- CVEN 4087 Engineering Contracts
- ELEC 1510 Digital Logic
- ENGL 3154 Technical Writing
- ENGL 3170 Business Writing
- ENVS 3082 Energy and the Environment
- GEOG 1602 Urban Studies and Planning
- GEOG 4080 Introduction to GIS
- IDST 4010 Foundations of STEM Communication
- LDAR 3601 Intro to Landscape Arch: Engaging Designed Landscape
- MECH 2024 Introduction to Materials Science
- SPAN 2110 Second Year Spanish I
- SUST 3010 Sustainability: Past, Present, and Future
- URPL 3000 Planning the Built Environment
- URPL 4000 Sustainable Urban Planning

**Total Hours** 128

1. Students must meet with an advisor to determine an appropriate course sequence from the following areas:
   - Civil Engineering (must take at least 1 design class)
   - Computer Science
   - Electrical Engineering (must take at least 1 design class)
   - Mechanical Engineering (must take at least 1 design class)

2. Students who take CHEM 2031 & CHEM 2038 to fulfill the chemistry requirement will need an additional semester hour to reach the 128 semester hours required for the degree.

3. Specific math and science courses are prerequisites to some Engineering Specialty courses. Please consult with an advisor.

**Note**

Up to two 5000-level CEMT or CVEN courses taken at CU Denver for the BS can be applied to a CE Master's degree at CU Denver if relevant to
the student's Master's degree emphasis as determined by the students 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/).