ARCHITECTURAL ENGINEERING - MASTER OF SCIENCE (MS)

Graduate studies in architectural engineering are offered through the Department of Civil, Environmental and Architectural Engineering. The department offers a Master of Science degree with study emphases in several major areas:

- building systems engineering
- construction engineering and management
- engineering for developing communities

For more information, visit the department’s Graduate Studies (http://www.colorado.edu/ceae/prospective-students/graduate-studies) webpage.

Concurrent Degree Program
BS/MS in Architectural Engineering

A concurrent BS/MS degree program in architectural engineering is available. Students may apply to the program when they have 75–110 credit hours toward the undergraduate BS degree (including completed and in-progress courses). Once accepted into the program, students are allowed to count 6 credit hours taken at the graduate level for both the BS and MS degrees (if certain grade and GPA requirements are met); this allows a student to obtain both degrees in five to six years.

For more information, visit the BS/MS Program (http://www.colorado.edu/ceae/current-students/undergraduate-studies/bsms-program) webpage.

Requirements

For a Master of Science (MS) degree in architectural engineering, students may undertake Plan I (with a thesis) or Plan II (based on course work).

Up to 6 credits of independent study may be taken, where an individual course of study is worked out between the student and a faculty member. Up to 9 credits of graduate courses can be transferred from another institution. Students are allowed up to 6 credits in total of non-technical course work for the MS/PhD degree.

Degree Plans
Plan I: Thesis Option
Plan I requires 24 credits of course work, plus 6 credits of thesis work. The thesis is a formal research report that discusses an organized research topic. Experience has shown that it takes a student from 24 to 30 months to complete this plan. Financial support is generally limited to exceptionally well-qualified students selecting Plan I.

Plan II: Non-Thesis Option
Plan II requires 30 credits of course work. It can be successfully completed in 18–24 months by a diligent student. The 30 credits must include a 3-credit Master’s Report (AREN 6960). Note that one-half of the course work must be taken in the CEAE Department (an exception may be made if the relevant courses were taken as part of an undergraduate degree).

Course Requirements

Courses offered in the architectural engineering graduate program may be separated into four tracks, one specific to the Construction Engineering & Management discipline and three related to the Building Systems Engineering discipline. Students may decide to concentrate in one of these track areas, or they may wish to take a broad selection from the courses; there is no requirement for picking any specific track under the general track option.

With the approval of the advisor, non-CEAE courses at the 4000 level may be used for graduate credit up to a maximum of 6 credits.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
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<tbody>
<tr>
<td>CVEN 5830</td>
<td>Special Topics for Seniors/Grads (Building Energy Systems)</td>
<td>3</td>
</tr>
<tr>
<td>AREN 5890</td>
<td>Sustainable Building Design</td>
<td>3</td>
</tr>
<tr>
<td>CVEN 5836</td>
<td>Special Topics for Seniors/Grads (CEM Fundamentals)</td>
<td>3</td>
</tr>
<tr>
<td>Applied Math course</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Electives</td>
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<td>9</td>
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Building Energy Engineering Track
Select 9 credits from the following:

- AREN 5110 HVAC System Design
- AREN 5080 Computer Simulation of Building Energy Systems
- CVEN 5830 Special Topics for Seniors/Grads (Building Electrical Systems)
- AREN 5020 Building Energy Audits
- CVEN 5830 Special Topics for Seniors/Grads (Applied Data Analysis & Modeling)
- CVEN 5830 Special Topics for Seniors/Grads (CFD of Buildings & Environment)

Illumination Engineering Track
Select 9 credits from the following:

- CVEN 5830 Special Topics for Seniors/Grads (Illumination 2)
- CVEN 5830 Special Topics for Seniors/Grads (Luminous Radiative Transfer)
- CVEN 5830 Special Topics for Seniors/Grads (Daylighting)
- CVEN 5830 Special Topics for Seniors/Grads (Advanced Lighting Design)

Materials and Resources Track
Select 9 credits from the following:

- CVEN 5830 Special Topics for Seniors/Grads (Forensic Engineering)
- CVEN 5835 Special Topics for Seniors/Grads (Design of Wood Structures)
- CVEN 5835 Special Topics for Seniors/Grads (Design of Masonry Structures)
- CVEN 5830 Special Topics for Seniors/Grads (Sustainable Materials & Structures)
- CVEN 5831 Special Topics (Construction Materials)
- CVEN 5565 Life-Cycle Engineering of Civil Infrastructure Systems

Construction Engineering & Management Track
Select 9 credits from the following:
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>CVEN 5246</td>
<td>Legal Aspects of Construction</td>
</tr>
<tr>
<td>CVEN 5276</td>
<td>Engineering Risk and Decision Analysis</td>
</tr>
<tr>
<td>CVEN 5226</td>
<td>Construction Safety</td>
</tr>
<tr>
<td>CVEN 5286</td>
<td>Design Construction Operations</td>
</tr>
<tr>
<td>CVEN 5836</td>
<td>Special Topics for Seniors/Grads (BIM for Construction)</td>
</tr>
<tr>
<td>CVEN 5346</td>
<td>Managing Construction and Engineering Projects and Organizations</td>
</tr>
</tbody>
</table>

**Engineering for Developing Communities Certificate**

Students admitted to the Engineering for Developing Communities (EDC) graduate certificate program (catalog.colorado.edu/graduate/colleges-schools/engineering-applied-science/programs-study/civil-engineering/engineering-developing-communities-graduate-certificate) must fulfill the course work and practicum requirements of that program. For AREN students, up to 6 credits of the required EDC course work can count as course work needed for the PhD degree.