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
- global engineering

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

Bachelor’s–Accelerated Master’s Degree Program

Students may earn this degree as part of the Bachelor’s–Accelerated Master’s (BAM) degree program, which allows currently enrolled CU Boulder undergraduate students the opportunity to earn a bachelor’s and master’s degree in a shorter period of time.

For more information, see the Accelerated Master’s tab for the associated bachelor’s degree(s): Architectural Engineering - Bachelor of Science (BS) (catalog.colorado.edu/undergraduate/colleges-schools/engineering-applied-science/programs-study/civil-environmental-architectural-engineering/architectural-engineering-bachelor-science-bsare/#acceleratedmasterstext)

Requirements

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

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 coursework for the MS/PhD degree.

Degree Plans

Plan I: Thesis Option

Plan I requires 24 credits of coursework, 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 27 credits of coursework, plus 3 credits of MS project work. The 3-credit Master’s Report (AREN 6960) is related to an applied research AREN topic. It can be successfully completed in 18–24 months by a diligent student. Note that one-half of the coursework must be taken in the CEAE Department (an exception may be made if the relevant courses were taken as part of an undergraduate degree).

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.

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.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>AREN 5001</td>
<td>Building Energy Systems: Thermal, Electrical &amp; Lighting Sys</td>
<td>3</td>
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<tr>
<td>Electives (Varies by Plan)</td>
<td>6-9</td>
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Building Energy Engineering Track

Select 15 credits from the following: 15

- AREN 5010 Energy System Modeling and Control
- AREN 5110 HVAC System Design
- AREN 5060 Distributed Electricity Generation
- AREN 5080 Computer Simulation of Building Energy Systems
- AREN 5830 Architectural Engineering Special Topic (Building Electrical Systems)
- AREN 5020 Building Energy Audits
- AREN 5890 Sustainable Building Design
- AREN 5830 Architectural Engineering Special Topic (Applied Data Analysis & Modeling)
- AREN 5830 Architectural Engineering Special Topic (CFD of Buildings & Environment)
- AREN 5830 Architectural Engineering Special Topic (Grid Connected Systems)
- AREN 5830 Architectural Engineering Special Topic (Modeling and Simulation of Community Energy Systems)

Illumination Engineering Track

Select 15 credits from the following: 15

- AREN 5830 Architectural Engineering Special Topic (Illumination 2)
- AREN 5830 Architectural Engineering Special Topic (Luminous Radiative Transfer)
- AREN 5830 Architectural Engineering Special Topic (Daylighting)
- AREN 5830 Architectural Engineering Special Topic (Advanced Lighting Design)

Materials and Resources Track

Select 15 credits from the following: 15

- 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)
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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 15 credits from the following:

CVEN 5836 Special Topics for Seniors/Grads (Construction Engineering and Management Fundamentals)
CVEN 5246 Legal Aspects of Construction
CVEN 5276 Engineering Risk and Decision Analysis
CVEN 5226 Construction Safety
CVEN 5286 Design Construction Operations
CVEN 5836 Special Topics for Seniors/Grads (BIM for Construction)
CVEN 5346 Managing Construction and Engineering Projects and Organizations

Graduate Certificate in Global Engineering
Students admitted to the Graduate Certificate in Global Engineering program (catalog.colorado.edu/graduate/courses-schools/engineering-applied-science/programs-study/civil-engineering/engineering-developing-communities-graduate-certificate/) must fulfill the coursework and practicum requirements of that program. For AREN students, up to 6 credits of the required certificate coursework can count as coursework needed for the PhD degree.