The undergraduate minor in architectural engineering serves CU Boulder students who are interested in building science, engineering and system designs. The minor is intended to expose students to basic building science knowledge, engineering and system concepts, and calculation and design skills.

**Requirements**

**Admission**
A cumulative GPA of 2.750 or higher is required to be admitted to the minor.

The minor is not open to students pursuing the Bachelor of Science in architectural engineering or the Bachelor of Science in engineering plus with an architectural engineering disciplinary emphasis. In addition, the structural systems and construction engineering and management tracks (shown below) are not open to students pursuing the Bachelor of Science in civil engineering or the Bachelor of Science in engineering plus with a civil engineering disciplinary emphasis.

**Prerequisites**
The following prerequisite courses are required, with a grade of C- or higher in each. A student may be accepted into the minor with no more than two of these courses as deficiencies. All deficiencies must be completed before the minor is awarded.

- Calculus 1 (APPM 1350 or MATH 1300)
- Calculus 2 (APPM 1360 or MATH 2300)
- Calculus 3 (APPM 2350 or MATH 2400)
- Differential Equations and Linear Algebra (APPM 2360 or MATH 3130 + MATH 3430)
- Two semesters of calculus-based physics (PHYS 1110 and PHYS 1120)
- Statics (CVEN 2121, ASEN 2001, GEEN 2851, or MCEN 2023)

**Grade Requirements**
A cumulative GPA of 2.250 is required in the courses used to satisfy the minor requirements, with no individual grade lower than C-.

**Residency**
The minor requires 18 credit hours, at least nine of which must be AREN/ CVEN courses completed on the CU Boulder campus. This is composed of three required courses: two courses in a single track plus one elective course.

**Course Requirements**

**Required Core Courses**
- AREN 2050  Building Materials and Systems  3
- CVEN 3246  Introduction to Construction  3
- CVEN 3161  Mechanics of Materials 1  3
  or MCEN 2063  Mechanics of Solids

**Tracks (Choose one)**

<table>
<thead>
<tr>
<th>Structural Systems Track 1</th>
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<tbody>
<tr>
<td>CVEN 3525  Structural Analysis</td>
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<tr>
<td>CVEN 4545  Steel Design</td>
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<tr>
<td>or CVEN 4556  Reinforced Concrete Design</td>
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<tr>
<th>Electrical Systems Track</th>
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<tr>
<td>ECEN 3030  Electrical/Electronic Circuits Non-Major</td>
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<tr>
<td>or ECEN 2250  Introduction to Circuits and Electronics</td>
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<tr>
<td>or ECEN 301  Circuits and Electronics for Mechanical Engineers</td>
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| AREN 4570  Building Electrical Systems Design 1 |

**Lighting Track**
- AREN 3540  Illumination I
- AREN 4550  Illumination 2

**Construction Engineering & Management Track**
- AREN 4506  Pre-construction Estimating and Scheduling
- AREN 4606  Construction Project Execution and Control

**Elective**  3
- AREN 1027  Engineering Drawing
- AREN 4010  HVAC System Modeling and Control
- AREN 4130  Optical Design for Illumination and Solid State Lighting
- AREN 4315  Design of Masonry Structures
- AREN 4530  Advanced Lighting Design
- AREN 4560  Luminous Radiative Transfer
- AREN 4580  Daylighting
- AREN 4830  Special Topics for Seniors/Grads (Sustainable Lighting Workshop, Computer Simulation of Building Systems, or Forensic Engineering)
- AREN 4890  Sustainable Building Design
- AREN 4990  Comp Fluid Dynamics (CFD) Analysis for Built/ Natural Enviromnts
- AREN 5020  Building Energy Audits
- AREN 5050  Advanced Solar Design
- AREN 5070  Thermal Analysis of Buildings
- CVEN 4565  Design of Wood Structures
- CVEN 5830  Special Topics for Seniors/Grads (Distributed Generation Systems, Color Theory/Light Source, or Applied Data Analysis & Modeling)
- ENVD 3114  History and Theory of Environmental Design at the Small Scale: Buildings
- ENVD 3134  History and Theory of Environmental Design and the Medium Scale: Precincts

Total Credit Hours  18

1 Not open to students pursuing the Bachelor of Science in civil engineering or the Bachelor of Science in engineering plus with a civil engineering disciplinary emphasis.