<table>
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<tr>
<th>Sem</th>
<th>CR</th>
<th>Course</th>
<th>Prerequisite</th>
<th>Concentration</th>
<th>Proficiency I-3***</th>
<th>Proficiency II-3***</th>
<th>College-Appr. Writing Course-3**</th>
<th>Elective</th>
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<tr>
<td>8 SPR</td>
<td>17</td>
<td>Tech Elective-3</td>
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<td>Concentration II AREN/CVEN XXXX-3***</td>
<td>AREN/CVEN Tech Elective-3</td>
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<td>Concentration I AREN/CVEN XXXX-3***</td>
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<td>5 FALL</td>
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<td>AREN 3540-3 # Illumination 1 (CSCI 1320, APPM 2350)</td>
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<td>4 SPR</td>
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<td>APPM 2360-4 Introduction to Linear Algebra &amp; Differential Equations (APPM 1360)</td>
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<td>17</td>
<td>APPM 2350-4 Calculus III for Engineers (APPM 1360)</td>
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<td>2 SPR</td>
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<td>APPM 1360-4 Calculus II for Engineers (APPM 1350)</td>
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<td>1 FALL</td>
<td>16</td>
<td>APPM 1350-4 Calculus I for Engineers (APPM 1235 or placement)</td>
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# Course is offered only once per year (FALL or SPRING as shown).
()
Prerequisite and co-requisite requirements for course listed.
* AREN 4317 prerequisites: ARCH 4010; and (AREN 4506 and CVEN 3256) or (AREN 4550 and 4570) or (CVEN 4161 and 4555) or (AREN 4110 and 4890).
** Writing course options: HUEN 1010 (first-year students only); or HUEN 3100, WRTG 3030, WRTG 3035, or PHYS 3050 (junior standing).
*** See reverse for semesters that Proficiency and Concentration courses are offered (fall and/or spring) – varies by concentration.
+ Your computing/intro course requirements may be different than shown here based on the semester that you entered the AREN program. See the AREN undergraduate advisor with questions.
ARCHITECTURAL ENGINEERING CONCENTRATIONS

At least one concentration must be completed in its entirety, including all fundamental, proficiency, and concentration courses.

Fundamental – All students take the fundamental courses in all four concentration areas.
Proficiency – Students choose two of the four areas in which to take a second proficiency-level course.
Concentration – Students choose one area in which to take two additional concentration-level courses.

STRUCTURAL SYSTEMS
Fundamental – CVEN 3525 Structural Analysis (CVEN 3161) – Fall and Spring
Proficiency – CVEN 4545 Steel Design (CVEN 3525) – Spring
or CVEN 4555 Reinforced Concrete Design (CVEN 3525) – Fall
Concentration – CVEN 4161 Mechanics of Materials II (CVEN 3161) – Fall
and one of the following:
CVEN 4545 or 4555 (whichever not selected as proficiency)

MECHANICAL SYSTEMS
Fundamental – AREN 3010 Energy Efficient Buildings (AREN 2050, 2110, 2120) – Fall
Proficiency – AREN 4110 HVAC System Design (AREN 3010) – Spring
Concentration – AREN 4830 Computer Simulation of Building Systems – Spring, intermittent
AREN 4890 Sustainable Building Design (AREN 3010) - Fall

LIGHTING/ELECTRICAL SYSTEMS
Fundamental – ECEN 3030/AREN 3040 Electrical Circuits (APPM 2360) – Spring (starting 2020)
and AREN 3540 Illumination I (computing, APPM 2350) – Fall
Proficiency – AREN 4130 Optical Design (AREN 3540) – Varies
or AREN 4550 Illumination II (AREN 3540) – Fall (starting 2020)
or AREN 4560 Luminous Radiative Transfer (AREN 3540) – Spring, intermittent
or AREN 4570 Electrical Systems (ECEN 3030) – Fall
Concentration – AREN 4550; AREN 4130 or 4560; AREN 4570 (two courses not selected as proficiency)

CONSTRUCTION ENGINEERING & MANAGEMENT
Fundamental – CVEN 3246 Introduction to Construction (4th-semester standing) – Fall and Spring
Proficiency – CVEN 3256 Construction Equipment & Methods (CVEN 3246) – Fall and Spring
Concentration – AREN 4506 Project Management I (CVEN 3246) – Fall and Spring
AREN 4606 Project Management II (CVEN 3246, AREN 4506) – Spring

ELECTIVE REQUIREMENTS

Basic Engineering Elective – Students who do not take GEEN 1400 may substitute any 3-credit technical course given in the engineering college with a designator ASE, AREN, APPM, CHEN, COEN, CVEN, CSCI, ECEN, EMEN, EVEN, GEEN, or MCEN, or other course approved by the CEAE Curriculum Committee. Remedial courses (precalculus, etc.) or courses approved as HSS electives may not be used.

Free Elective – Any college-level course, except: cannot be remedial courses needed to fulfill deficiencies (algebra, trigonometry, precalculus, introductory chemistry, etc.) and cannot be similar to courses used toward graduation requirements (algebra-based physics, etc.).

Humanities and Social Science (HSS) Elective – See the College requirements and approved courses at https://www.colorado.edu/engineering-advising/get-your-degree/degree-requirements/humanities-social-sciences-and-writing-requirements.

Technical Elective – Generally, an upper-division (3000+) science or engineering course with technical content. All upper-division AREN/CVEN courses are technical electives; up to 6 credits outside of AREN/CVEN may be selected with faculty advisor consent. Up to 3 credits of independent study, undergraduate research, or the following ROTC courses are acceptable as technical elective credit: AIRR 3010 or NAVR 4010. See the CEAE website for a list of approved technical electives for AREN students.