INTEGRATED DESIGN ENGINEERING *Architectural Emphasis* – *FALL 2022*

1	**APPM 1350 (4)** Calculus 1 For Engineers	**CHEN 1201 (4)** Chemistry of Energy & Materials	**CHEM 1114 (1)** Gen Chemistry 1 Lab	**CSCI 1200 (3)** Intro to Computational Thinking Fall Only		**Writing Requirement(3)**
2	**APPM 1360 (4)** Calculus 2 For Engineers (PR: APPM 1350)	**PHYS 1110 (4)** General Physics 1 (CR: APPM 1350)	**GEEN 1400 (3)** Engineering Projects	**AREN 1027 (3)** Engineering Drawing		**Humanities & Social Science (3)**
3	**APPM 2350 (4)** Calculus 3 For Engineers (PR: APPM 1360)	**GEEN 2400 (3)** Engineering Projects for the Community (PR: GEEN 1400)	**GEEN 2851 (3)** Statics & Structures (PR: APPM 1360, PHYS 1110) Fall Only	**AREN 2050 (3)** Building Materials and Systems Fall Only		**Humanities & Social Science (3)**
4	**APPM 2360 (4)** Linear Algebra & Differential Equations (PR: APPM 1360)	**PHYS 1120 (4)** General Physics 2 (PR: PHYS 1110)	**PHYS 1140 (1)** Experimental Physics (CR: PHYS 1120)	**CVEN 3161(3)** Mechanics of Materials I (PR: GEEN 2851, CR: APPM 2360)	**Concentration Course (3)**	**Humanities & Social Science (3)**
5	**GEEN 3010 (3)** Circuits for Engineers (PR: APPM 2360) (CR: PHYS 1140) Fall Only	**GEEN 3400 (3)** Invention & Innovation (PR: GEEN 2400)	**GEEN 3852 (3)** Thermodynamics (PR: PHYS 1110) Fall Only	**AREN Focus 1 (3)** See Page 2 for option	**Technical Elective (3)** See page 2 for options	
6	**Concentration Course (3)**	**Free Elective or Concentration Course (3)**		**AREN 3080 (3)** Arch. Design Studio 1 (PR: AREN 1027) Spring Only	**AREN Focus 2 (3)** See Page 2 for option	**Humanities & Social Science (3)** Upper Division
7	**Concentration Course (3)**	**Free Elective (3)**		**AREN 4080 (2)** Arch. Design Studio 2 (PR: AREN 3080) (CR: AREN 4318) Fall Only	**AREN 4318 (5)** AREN Design 1 (PR: AREN 4110, AREN 4506, AREN 4550, CVEN 4545 or CVEN 4555) (CR: AREN 4570, AREN 4080) Fall Only	**Humanities & Social Science (3)** Upper Division
8	**Concentration Course (3)**	**Free Elective or Concentration Course (3)**	**GEEN 3853(4)** Data Analysis for Engineers (PR: APPM 2360, CSCI 1300, PHYS 1140) (CR: GEEN 3010, GEEN 3024, Writing)	**Free Elective (4)**	**AREN 4319 (2)** AREN Design 2 (PR: AREN 4318, AREN 4080) Spring Only	**Example** **COURSE NUMBER (Cr.)** Course Name (PR: Pre-Requisites) (CR: Co-Requisites) Fall or Spring Only Course

Effective: Fall 2022

Integrated Design Engineering Curriculum

Architectural Engineering Emphasis

Standard Course Substitutions

- **APPM 1350**: MATH 1300
- **APPM 1360:** MATH 2300
- **APPM 2350:** MATH 2400
- **APPM 2360:** MATH 2130 and MATH 3430
- **AREN 1027:** CVEN 1027, GEEN 1017**,** MCEN 1025 (or EMEN 4100)
- **CHEN 1201:** CHEN 1211, MCEN 1024 (CHEM 1113 approved for transfer students)
    - 30 total science credits are required. If alternate courses are taken, additional science credits are required to reach 30.
- **CSCI 1200**: ASEN 1320 ,CSCI 1320, CSCI 1300, CHEN 1310, ECEN 1310 approved for transfer students
- **CVEN 3161:** MCEN 2063
- **GEEN 2851:** CVEN 2121, MCEN 2023
- **GEEN 3010:** ECEN 3010
- **GEEN 3024:** ASEN 1022, MCEN 2024
- **GEEN 3852:** ASEN 2110, EVEN 3012, CHEN 3320, MCEN 3012
- **GEEN 3853:** MCEN 3047

AREN Focus Area Courses

CONSTRUCTION :

- CVEN 3246: Introduction to Construction
- AREN 4506: Pre-construction Estimating and Scheduling
- AREN 4606: Construction Project Execution and Control

LIGHTING/ELECTRICAL SYSTEMS

- AREN 3540: Illumination I
- AREN 4550: Illumination II
- AREN 4570: Building Electrical Systems Design I

MECHANICAL SYSTEMS

- AREN 2120: Fluid Mechanics and Heat Transfer
- AREN 3010: Energy Efficient Buildings
- AREN 4110: HVAC System Design

STRUCTURAL SYSTEMS

- CVEN 3525: Structural Analysis
- CVEN 4545 Steel Design
- CVEN 4555 Reinforced Concrete Design

Technical Elective Options

CONSTRUCTION ENGINEERING & MANAGEMENT

Strongly recommended: **AREN 4606 Construction Project Execution & Control** (PR: AREN 4506) – spring only
CVEN 3256 Construction Equipment & Methods (PR: CVEN 3246)

Other options: AREN 4315 Masonry Design (PR: CVEN 3525) – spring only every other year
CVEN 3708 Geotechnical Engineering 1 (PR: CVEN 3161)

LIGHTING/ELECTRICAL SYSTEMS

Strongly recommended: **AREN 4130 Optical Design** (PR: AREN 3540) – fall only
AREN 4620 Adaptive Lighting Systems (PR: AREN 4550) – fall only

Recommended: AREN 4530 Advanced Lighting Design (PR: AREN 4550) – spring only
AREN 4560 Luminous Radiative Transfer (PR: AREN 3540) – spring only

MECHANICAL SYSTEMS

AREN 4010 Energy System Modeling & Control (PR: AREN 4110) – fall only, intermittent
AREN 4890 Sustainable Building Design (PR: AREN 3010) – fall only, intermittent
AREN 4990 Computational Fluid Dynamics (CFD) Analysis (PR: AREN 2120, APPM 2360) – intermittent
AREN 5020 Building Energy Audits (PR: AREN 3010) – spring only, intermittent
AREN 5080 Computer Simulation of Building Systems (PR: AREN 3010) – spring only, intermittent

STRUCTURAL SYSTEMS

Strongly recommended: **CVEN 4545 Steel Design** (PR: CVEN 3525) – spring only
CVEN 4555 Reinforced Concrete Design (PR: CVEN 3525) – fall only

Recommended: CVEN 4565 Design of Wood Structures (PR: CVEN 3525) – spring only every other year

Other options: AREN 4315 Masonry Design (PR: CVEN 3525) – spring only every other year
AREN 5660 Embodied Carbon in Buildings (instructor consent) – spring only
CVEN 4161 Mechanics of Materials II (PR: CVEN 3161) – fall only

Humanities & Social Science Electives/Writing Requirements

Visit the college's Humanities, Social Sciences, and Writing Requirements webpage for options.

Grade Requirements

The minimum passing grade for a prerequisite or co-requisite course within the Civil Engineering Emphasis is a C-. This requirement includes courses completed in another program or department (APPM, PHYS, etc.). The minimum passing grade for standalone classes is a **D-**. In addition, students need to have a cumulative and major GPA of at least 2.000 in order to graduate from the College of Engineering. **Pass/Fail** is only permitted for up to 16 Free Elective credits.