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
- Illumination engineering
- Materials and carbon
- Construction engineering and management

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) (https://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.

Code	Title	Credit Hours
Core Courses		**6**
AREN 5001	Building Science and Engineering 1	
AREN 5002	Building Science and Engineering II	
General Courses		**6-9**
(Suitable for any focus area)		
AREN 5890	Sustainable Building Design	
AREN 5990	Compu Fluid Dynamics (CFD) Analysis for Built/Natural Envmnts	
AREN 5830	Architectural Engineering Special Topic (Building Systems Modeling and Simulation)	
AREN 5030	Data Science for Energy and Buildings	
CVEN 5836	Special Topics for Seniors/ Grads (Construction Engineering Fundamentals)	
Focus Area: Building Energy Engineering		
AREN 5010	Energy System Modeling and Control	
AREN 5020	Building Energy Audits	
AREN 5060	Distributed Electricity Generation	
AREN 5080	Computer Simulation of Building Energy Systems	
AREN 5110	HVAC System Design	
AREN 5570	Building Electrical Systems Design 1	
AREN 5830	Architectural Engineering Special Topic (Modeling and Simulation of Community Energy Systems)	
AREN 5090	Optimizing Grid Connected Systems	
ECEN 5007	Special Topics (Data Analytics and Decision-making for Power Systems)	
ECEN 5007	Special Topics (Renewable Energy Future of Power Grid)	
ECEN 5007	Special Topics (Power Systems Planning and Optimizations)	
Focus Area: Illumination Engineering		
AREN 5830	Architectural Engineering Special Topic (Illumination 2)	
AREN 5130	Optical Design for Illumination and Solid State Lighting	
AREN 5560	Luminous Radiative Transfer	
AREN 5580	Daylighting	
AREN 5620	Adaptive Lighting Systems	

AREN 5830	Architectural Engineering Special Topic (Advanced Lighting Design)
Focus Area: Materials and Carbon	
AREN 5650	Forensic Engineering
CVEN 5835	Special Topics for Seniors/Grads (Design of Wood Structure)
AREN 4315	Design of Masonry Structures (must enroll in CVEN 5849, independent study, to receive graduate credit)
AREN 5660	Embodied Carbon in Buildings
CVEN 5831	Special Topics (Construction Materials)
Focus Area: Construction Engineering & Management	
CVEN 5246	Legal Aspects of Construction
CVEN 5276	Engineering Risk and Decision Analysis
CVEN 5226	Construction Safety
CVEN 5346	Managing Construction and Engineering Projects and Organizations
CVEN 5836	Special Topics for Seniors/Grads (Infrastructure Asset Management)

Graduate Certificate in Global Engineering

Students admitted to the Graduate Certificate in Global Engineering program (https://catalog.colorado.edu/graduate/colleges-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.