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ARCHITECTURAL ENGINEERING -PROFESSIONAL MASTER OF SCIENCE (MSAE)

The Professional Master of Science in Architectural Engineering offers contemporary programs of study related to building design and construction.

Students are able to select from one of six focus areas:

- · Data science for buildings
- Building energy
- Building decarbonization
- Lighting and daylighting
- · Indoor environmental quality for buildings
- · Structural engineering
- · Construction engineering and management

Students are expected to complete 30 credit hours of coursework to meet the requirements of the MS degree. Each subplan consists of required courses and elective courses that must be selected in consultation with an academic advisor. Students should be able to successfully complete all degree requirements within 12–18 months.

Requirements

Required Courses and Credits

As alternatives to some of the elective courses, up to 6 credit hours in independent studies can be considered by the students to enhance their professional skills in any of the focus areas listed below.

Data Science for Buildings Subplan

Code	Title	Credit Hours
Required Courses		
AREN 5001	Building Science and Engineering I	3
AREN 5002	Building Science and Engineering II	3
EMEN 5020	Finance for Engineering Managers	3
or CVEN 5006	Construction Engineering and Management Fundamentals	
AREN 5030	Data Science for Energy and Buildings	3
CVEN 6833	Special Topics (Advanced Data Analysis Techniques)	3
CVEN 5836	Special Topics for Seniors/Grads (AI/ML in the Built Environment)	3
Elective Courses		
Students can select any set of graduate-level elective courses in architectural engineering, civil engineering, or another science or engineering field with advisor approval, depending on the desired focus area and professional skills.		

Building Energy Su	ıbplan	
Code	Title	Credit Hours
Required Courses		
AREN 5001	Building Science and Engineering I	3
AREN 5002	Building Science and Engineering II	3
EMEN 5020	Finance for Engineering Managers	3
or CVEN 5006	Construction Engineering and Management Fundamentals	
Select two of the fo	llowing:	
AREN 5010	Energy System Modeling and Control	
AREN 5080	Computer Simulation of Building Energy Systems	
AREN 5990	Compu Fluid Dynamics (CFD) Analysis for Built/Natural Envmnts	
AREN 5090	Optimizing Grid Connected Systems	
AREN 5830	Architectural Engineering Special Topic (Building Systems Simulation and Modeling)	
Elective Courses		
Students can select in architectural eng science or engineer on the desired focus	t any set of graduate-level elective courses ineering, civil engineering, or another ing field with advisor approval, depending s area and professional skills.	15
Building Decarbon	ization Subplan	
Code	Title	Credit Hours
Required Courses		
AREN 5001	Building Science and Engineering I	3
AREN 5002 or	Building Science and Engineering II	3
EMEN 5020	Finance for Engineering Managers	3
or CVEN 5006	Construction Engineering and Management Fundamentals	
AREN 5660	Embodied Carbon in Buildings	3
AREN 5890	Sustainable Building Design	3
Elective Courses		
Students can select in architectural eng science or engineer on the desired focu	t any set of graduate-level elective courses ineering, civil engineering, or another ing field with advisor approval, depending s area and professional skills.	15
Lighting and Dayli	ghting Subplan	
Code	Title	Credit Hours
Required Courses		
AREN 5001	Building Science and Engineering I	3
AREN 5550	Illumination 2	3
EMEN 5020	Finance for Engineering Managers	3
or CVEN 5006	Construction Engineering and Management Fundamentals	
AREN 5580	Daylighting	3
AREN 5540	Architectural Exterior and Landscape Lighting Design	3

Select one of the following

AREN 5620	Adaptive Lighting Systems		
AREN 5630	Advanced Lighting Design		
Elective Courses			
Students can select any set of graduate-level elective courses 12			
in architectural engineering, civil engineering, or another			
science or engineering field with advisor approval, depending			

on the desired focus area and professional skills.

Indoor Environmental Quality for Buildings Subplan Code Title

Credit Hours

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Required Courses

AREN 5001	Building Science and Engineering I	3
AREN 5002	Building Science and Engineering II	3
EMEN 5020	Finance for Engineering Managers	3
or CVEN 5006	Construction Engineering and Management Fundamentals	
AREN 5990	Compu Fluid Dynamics (CFD) Analysis for Built/Natural Envmnts	3
AREN 5620	Adaptive Lighting Systems	3
MCEN 5141	Indoor Air Pollution	3
Elective Courses		
Students can select any set of graduate-level elective courses in architectural engineering, civil engineering, or another		

science or engineering field with advisor approval, depending on the desired focus area and professional skills.

Structural Engineering Subplan

Code	Title	Credit Hours
Required Courses		
CVEN 5111	Structural Dynamics	3
CVEN 5525	Computational Structural Analysis 1	3
CVEN 6595	Earthquake Engineering	3
AREN 5660	Embodied Carbon in Buildings	3
Select one of the follo	owing:	
CVEN 5575	Advanced Topics in Steel Design	
CVEN 5585	Advanced Topics in Reinforced Concrete Design	
CVEN 5835	Special Topics for Seniors/Grads (Design of Masonry Structures or Design of Wood Structures)	
Elective Courses		
Students can select a	any set of graduate-level elective courses	15

Students can select any set of graduate-level elective courses in architectural engineering, civil engineering, or another science or engineering field with advisor approval, depending on the desired focus area and professional skills.

Construction Engineering Management Subplan

Code	litle	Credit Hours
Required Courses		
AREN 5001	Building Science and Engineering I	3
CVEN 5006	Construction Engineering and Management Fundamentals	3
CVEN 5836	Special Topics for Seniors/Grads (BIM for Capital Projects)	3

Select three of the following:

CVEN 5226	Construction Safety
CVEN 5346	Managing Construction and Engineering Projects and Organizations
CVEN 5446	Infrastructure Asset Management
CVEN 5246	Legal Aspects of Construction

Elective Courses

Students can select any set of graduate-level elective courses in architectural engineering, civil engineering, or another science or engineering field with advisor approval, depending on the desired focus area and professional skills.

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Learning Outcomes

By the completion of the program, students will be able to:

- · Demonstrate a mastery of fundamentals of architectural engineering.
- · Analyze and develop advanced solutions to improve the performance and/or construction of buildings.
- · Communicate knowledge through effective oral presentations and technical writing.