MASTER OF SCIENCE IN ARCHITECTURAL ENGINEERING

The Master of Science in Architectural Engineering is a research and thesis-based degree program oriented toward students who wish to develop more knowledge about the design, construction, and operation of buildings and their systems. Students are required to specialize in one field of concentration: Building Systems, Construction Management, or Structures.

Students are expected to conduct research at a rigorous level above and beyond the coursework-only Master of Engineering in Architectural Engineering degree program. The program also serves as a foundation for research for students who intend to pursue a doctoral degree. Students with a variety of academic backgrounds are eligible to apply for the program, including those with undergraduate degrees in engineering disciplines (e.g. architectural, civil, mechanical, environmental, and others) and non-engineering disciplines (e.g. architecture, construction management, environmental science, and others).

Students specializing in the Building Systems concentration are expected to have passed thermodynamics and fluid mechanics in their undergraduate studies. Students specializing in the Structures concentration are expected to have passed steel design and concrete design. If students have not passed these courses, they may be required to take deficiency courses in their first year of study or in the summer before their first year of study. Each applicant will be evaluated on a case-by-case basis during the application review process to determine any deficiency course requirements.

Curriculum

Degree candidates in the master of science program must complete a minimum of 32 credit hours, six to eight of which must be research and thesis credits. Up to 12 credit hours of 400-level undergraduate coursework may be included in the program with prior adviser approval. An oral defense of the thesis constitutes the comprehensive examination, and no additional written comprehensive examination is required.

Requirement	Credits
Minimum Credits Required	32
Maximum 400-Level Credit	12
Minimum 500-Level Credit	20
Minimum CAE Credit	24
Maximum Transfer Credit	9

Code	Title	Credit Hours
Required Courses		(6)
CAE 513	Building Science [1]	3
CAE 523	Statistical Analysis Engg Data [1]	3
Thesis Research		(6-8)
CAE 591	Research and Thesis M.S.	6-8
Specialization Electives		(18)
Select a minimum of 18 credit hours in one field of concentration. See the Specializations tab on this page.		18
Elective Courses		(0-2)
Select zero to two credit hours from any of the ARCE fields of concentration [2]		0-2

[1]   Students who have previously passed an equivalent course in their prior degree programs may substitute another course for CAE 513 and/or CAE 523 with adviser and departmental approval.

[2]   General background courses, or graduate courses offered by the College of Architecture, Engineering Graphics, or other relevant departments in the Armour College of Engineering may be chosen as electives with adviser and departmental approval.

Architectural Engineering Specializations

Students must complete 18 credit hours from one area of specialization (Building Systems, Construction Management, or Structures). Other courses may be accepted for the specialization requirement with adviser and departmental approval.

Building Systems

Code	Title	Credit Hours
Select a minimum of 18 credit hours from the following:		18
ARCH 551	Desn Energy-Efficient Bldg I	3
ARCH 552	Design of Energy-Eff Bldg II	3
CAE 422	Sprinklers Standpipes Fire Pum	3
CAE 425	Fire Protection & Life Safety	3

Code	Title	Credit Hours
CAE 461	Plumbing/Fire Protection Dsgn	3
CAE 464	HVAC Systems Design	3
CAE 466	Building Electrical Systs Dsgn	3
CAE 467	Lighting Systems Design	3
CAE 510	Dynamics of Fire	3
CAE 515	BIM Applications for Bldg Perf	3
CAE 524	Building Enclosure Design	3
CAE 526	Energy Conservation Dsgn:Bldgs	3
CAE 527	Congrol of Bldg Envnmtl Systs	3
CAE 550	Applied Bldg Energy Modeling	3
CAE 553	Measurement & Instrumentation	3
CAE 556	Net Zero Energy Home Dsgn I	3
CAE 557	Net Zero Energy Home Dsgn II	3
CAE 575	Systems Analysis in Civil Engg	3
CAE 597	Special Problems	1-20
ENVE 576	Indoor Air Pollution	3
MMAE 517	Computational Fluid Dynamics	3
MMAE 525	Fundamentals of Heat Transfer	3
Total Credit Hours		**18**

Construction Management

Code	Title	Credit Hours
Select a minimum 18 credit hours from the following:		18
ARCH 560	Intd Bldg Deliv Prac/BIM	3
CAE 470	Constrctn Methods&Cost Estmg	3
CAE 471	Construction Plan & Scheduling	3
CAE 472	Construction Site Operation	3
CAE 473	Construction Contract Admin	3
CAE 486	Soil Site Improvement	3
CAE 570	Legal Issues in Civil Engrg	3
CAE 571	Lean Construction and Control	3
CAE 572	Construction Cost Acctg&Cntrl	3
CAE 573	Construction Mgmt with BIM	3
CAE 574	Economic Decision Analysis	3
CAE 575	Systems Analysis in Civil Engg	3
CAE 577	Constuction Equip Management	3
CAE 578	Construction Claims Mgmt	3
CAE 579	Real Estate Fundamentals	3
CAE 597	Special Problems	1-20
Total Credit Hours		**18**

Structures

Code	Title	Credit Hours
Select a minimum of 18 credit hours from the following:		18
CAE 410	Intro to Wind/Earthquake Engg	3
CAE 435	Experimental Anlys Structures	3
CAE 436	Dsgn Masonry/Timber Structures	3
CAE 457	Geotechnical Foundation Dsgn	3
CAE 503	Advanced Structural Analysis	3
CAE 504	Seismic Retrofit/Earthquake	4
CAE 506	Building Env Rehab Engineering	3
CAE 518	Advanced Reinforced Concrete	3

CAE 520	Buckling of Structures	4
CAE 522	Structural Model Analysis	4
CAE 525	Advd Steel&Composite Structure	4
CAE 530	Finite Element Method of Anlys	3
CAE 532	Analysis of Plates and Shells	4
CAE 533	Theory & Anlys of Thin Shells	3
CAE 534	Computational Techniques	3
CAE 537	Homeland Security Concerns	3
CAE 551	Prestressed Concrete	3
CAE 560	Plastic Methods	4
CAE 561	Structural Reliability	3
CAE 564	Foundations/Embankments/Earth	4
CAE 575	Systems Analysis in Civil Engg	3
CAE 582	Structural Wind&Earthquake Eng	4
CAE 597	Special Problems	1-20

Total Credit Hours	18