

# DOCTOR OF PHILOSOPHY IN ARCHITECTURAL ENGINEERING

The objective of the Doctor of Philosophy in Architectural Engineering program is to provide an avenue for the advanced study of the design, construction, and operation of buildings and their systems. Students can specialize in any relevant aspect of Architectural Engineering in which CAEE faculty members have expertise, which includes: building energy and environmental systems, structures, or construction engineering and management. Through state-of-the-art and original research, students are expected to achieve a high level of mastery in the study of buildings and their systems, which should be demonstrated by successful defense of their dissertation and the publication of novel research results in peer-reviewed academic journals. Students who earn a Doctor of Philosophy in Architectural Engineering will be prepared for careers in both academia and industrial research and development. The program is intended for students with bachelor's or master's degrees in architectural engineering, civil engineering, mechanical engineering, or other related disciplines.

To be admitted to candidacy, students must pass a qualifying examination, which involves an oral presentation of two research papers selected by the student's adviser. The qualifying examination is administered by a research committee approved by the chairperson. The exam is diagnostic in nature. The results of the exam will determine the student's potential for success in the Ph.D. program. The department may waive this requirement for students who hold an M.S. degree from Illinois Institute of Technology in the same field. This examination should be completed within three semesters of entry into the program.

Next, candidates must complete a comprehensive examination, which is an oral examination that is administered by a research committee approved by the chairperson. The candidate presents the research proposal and answers questions of a general professional nature. The research project must be in harmony with the interests of the faculty and with the facilities of the department. The candidate should pass the comprehensive examination at least one year prior to the date of graduation.

Although doctoral research can begin upon admission to the Ph.D. program, the major portion of the research should take place after the qualifying examination is passed and the research proposal (comprehensive exam) is approved by the research committee. Research will be conducted under the supervision of a full-time faculty member and students should work to involve all members of their research committee.

The preliminary thesis draft must meet the approval of all members of the research committee. An oral examination in defense of the thesis is given as an open university seminar. The thesis defense must meet with the approval of the research committee; if it does not, the committee has the authority to determine whether or not to grant a re-examination.

Requirement	Credits
Maximum Credits Required	84
Maximum 400-Level Credit	12
Maximum Transfer Credit	32

Code	Title	Credit Hours
<b>Required Courses (12)</b>		
CAE 513	Building Science <sup>1</sup>	3
CAE 517	HVAC Systems Design	3
or CAE 464	HVAC Systems Design	
CAE 526	Energy Conservation in Buildings <sup>2</sup>	3
CAE 523	Statistical Analysis of Engineering Data	3
or MATH 474	Probability and Statistics	
or MATH 564	Regression	
or MMAE 500	Data Driven Modeling	
or BME 533	Biostatistics	
or STAT 514	Applied Computational Statistics for Analytics	
<b>Major Electives (15)</b>		
Select a minimum of 15 credit hours of major electives from the list below:		15
CAE 461	Plumbing and Fire Protection Design	3
CAE 466	Building Electrical/Lighting Systems Design	3
CAE 467	Lighting Systems Design	3
CAE 505	Applications of Computational Fluid Dynamics in Engineering	3
or CAE 405	Applications of Computational Fluid Dynamics in Engineering	
CAE 506	Building Envelope Rehabilitation	3
CAE 524	Building Enclosure Design	3
or CAE 463	Building Enclosure Design	
CAE 538	Control of Building Environmental Systems	3
or CAE 438	Control of Building Environmental Systems	
CAE 550	Applied Building Energy Modeling	3
CAE 552	Introduction to Sustainable Building Design	3
or CAE 462	Introduction to Sustainable Building Design	
CAE 553	Measurement and Instrumentation in Architectural Engineering	3
or CAE 453	Measurement and Instrumentation in Architectural Engineering	
CAE 554	Building Commissioning	3
or CAE 454	Building Commissioning	
CAE 556	Net Zero Energy Building Design I	3
CAE 557	Net Zero Energy Building Design II	3
ENVE 503	Occupational and Environmental Health and Safety	3
ENVE 576	Indoor Air Pollution	3
MMAE 517	Computational Fluid Dynamics	3
<b>General Electives (21-33)</b>		
Select 21 to 33 credit hours of electives		21-33

**Ph.D. Research (24-36)**

CAE 691 Research and Thesis for Ph.D. Degree 24-36

<sup>1</sup> Transfer credit may include a maximum of 32 credit hours from a completed master's degree

<sup>2</sup> General elective coursework can included courses from ARCH, CAE, CHE, CHEM, CS, ECE, ENVE, EMGT, MATH, MMAE, SAM or others are acceptable with advisor approval