

Architectural Engineering Ph.D. Qualifying Examination

This document describes the process and content of the Architectural Engineering (AE) Qualifying Examination.

Timing

All AE Ph.D. students are required to take and pass the AE Qualifying Examination before the appointment of the Doctoral Degree Supervisory Committee. Students matriculating with a M.S./M.A.E. degree must take the Qualifying Exam by the beginning of their second year in the Ph.D. program, while students matriculating with only a B.S. degree must take the Qualifying Exam by the beginning of their third year in the Ph.D. program. The Qualifying Exam is typically offered twice a year during the Fall and Spring semesters. The examination date will be set by the Graduate Committee Chair.

Concentration Areas

The AE Qualifying Exam consists of a single area examination in a specific concentration area within architectural engineering. The concentration areas that are currently offered include the following:

- Acoustics
- Electrical
- Lighting
- Mechanical
- Structures

Procedures

The overall Qualifying Exam procedures are the same for all concentration areas. The Qualifying Exam consists of a written exam component and, if required, a supplementary oral exam component. Several outcomes are possible:

- **Overall Pass:** Students scoring at least 70% on the written exam pass the Ph.D. Qualifying Exam and can continue their graduate studies. No oral exam is required.
- **Oral Exam Required:** Students who score less than 70% but more than 60% on the written exam are required to take and pass a supplementary oral examination.
 - **Oral Exam Pass:** Students who pass the supplementary oral exam pass the Ph.D. Qualifying Exam and can continue their graduate studies.
 - **Oral Exam Fail:** Students who do not pass the supplementary oral exam fail the Ph.D. Qualifying Exam. They will be offered a second opportunity to take the Ph.D. Qualifying Exam within one calendar year, beginning again with a written exam.
- **Overall Fail:** Students scoring 60% or lower on the written exam fail the Ph.D. Qualifying Exam. No oral exam will be offered. Students who fail the written exam will be offered a second opportunity to take the Ph.D. Qualifying Exam within one calendar year, beginning again with a written exam.
- **Failed Twice:** Students who do not pass the Ph.D. Qualifying Exam process the second time will not be able to continue their program of graduate studies.

Written Examination: The written exam is a 4-hour exam. It is open-books and open-notes. A proctor will be present during the written exam to facilitate the exam but is not allowed to answer technical questions to allow for consistency across the concentration areas. The student will be asked to sign the attached form prior to commencing the exam. Calculators are permitted. No smartphones, tablets, laptops or any other device that can be connected to the Internet, are allowed in the examination room. Written exam questions will be developed in the specific topics that are listed below. Grading of the written exam will be completed by faculty members in the concentration area. The final written exam grade will be reported to the student and AE Graduate Committee as an overall percentage within six weeks of the written exam date.

Oral Examination: The oral exam is a 1-hour exam. It is closed-book and closed-note. Calculators are not permitted. No smartphones, tablets, laptops or any other device that can be connected to the Internet, are

allowed in the examination room. During the oral exam, a minimum of three faculty members will ask the student questions in the specific topics that are listed below. Examiners may ask follow-up questions from the written exam as well as broader questions about the specific topics listed below. Upon completion of the oral exam, the faculty examiners will deliberate immediately and decisions will be made by a majority vote. The final oral exam grade will be reported to the student and AE Graduate Committee as an overall pass / fail within one week of the oral exam date.

Specific Topics Tested

Specific topics under each concentration area are listed below. Weightings indicated are specific to the written exam.

Acoustics:

Fundamentals (AE 3300, MECH 816):	40% of total
Architectural Acoustics (AE 8330):	30% of total
Noise Control (AE 8300):	30% of total

Electrical:

Fundamentals (ELEC 2110):	60% of total
Building Electrical Systems I (AE 3220):	20% of total
Building Electrical Systems II (AE 8220):	20% of total

Lighting:

Fundamentals (AE 3200, AE 4200):	50% of total
Lighting Design Principles (AE 3200, AE 4020, AE 4200):	20% of total
Calculations and Analysis (AE 3200, AE 4200, AE 4020, AE 8250):	30% of total

Mechanical: *Students must declare their FOUR selected topics prior to registering for the Qualifying Exam. Each topic is worth 25 points as listed below:*

Thermodynamics (MENG 200):	25 points
Fluid Dynamics (CIVE 310):	25 points
Heat Transfer: (MENG 420):	25 points
HVAC (AE 3100, AE 4120, AE 8140):	25 points
Indoor Air Quality (AE 8116):	25 points
Controls (AE 8120):	25 points

Structures:

Fundamentals (Statics, Mech. of Materials, Structural Anal.)	40% of total
Structural Design (Concrete I, Steel I, Foundations)	30% of total
Advanced Structures topics (Masonry Design, Concrete II, Steel II)	30% of total

Last revised: 9/1/2017- ER-MA-JL-EE (Whole Graduate Committee)