

Department of Electrical and Computer Engineering Rules and Procedures for the Master's Course Option Comprehensive Examination

The procedures to be followed in creating, administering, and taking the Master's Course Option Comprehensive Examination (CE), within the Department of Electrical and Computer Engineering are set forth in this document. The CE is administered simultaneously with the EECE PhD Written Qualifying Exam (WQE).

This document provides the details of the responsibilities and the general structure of the CE, the timetable and procedures, and the results of the CE.

I. Responsibilities

Overall responsibility for the CE rests with the EECE Graduate Committee. It determines the goals and form of the CE, sets the level of performance students must achieve in order to pass, and reviews the results after each offering. Questions regarding the CE should be directed to the committee through the Director of Graduate Studies (DGS).

The Master's Course Option Comprehensive Examination (CE) Committee is composed of the members of the Graduate Committee and the department chair.

The EECE graduate office handles the registration of students and the administration for the CE. The DGS and the Graduate Committee report the results of the CE to the students.

II. General Structure of the WQE

1. The CE is a five-hour examination.
2. Only basic scientific calculators are allowed during the CE, which will be specified by the EECE department.
3. The CE consists of two parts:

- a) the required EECE graduate courses, Mathematics and Methods in Engineering, and Random Variables and Stochastic Processes in Engineering, (3 hours),
 - b) a selected major area (2 hours)
4. The questions will consist of problems from undergraduate curriculum, elective courses, and first year graduate level courses.
 5. The CE/WQE Topics are listed by course numbers in Appendix A.

III. Timetable and Procedures

1. The CE is offered simultaneously with the WQE, and is given once a year in January before the beginning of the Spring Semester.
2. Students who are required to take the CE must register by the last day of classes of the Fall semester. The graduate office will query all registered students for their selected major area.
3. The Department Chair selects who writes the exam questions for each area, with recommendations from the CE/WQE committee. The names of faculty writing questions will never be revealed to any students.
4. The DGS collects the exam questions and solutions from fellow faculty no later than four weeks before the CE/WQE date. Questions must be accompanied with solutions.
5. Following the offering of the exam, faculty who have composed the CE/WQE questions must grade them within two weeks after the start of the semester. Students will be informed of exam results within three weeks after the exam.

IV. Results

1. A passing grade is a total score of 70% or better with a weight of 60% for the fundamental exam and 40% for the required, major area exam.
2. Students will be informed in writing within three weeks of the results of the CE. Students who pass are certified to graduate with their M.S. degrees, contingent on completion of the necessary coursework for the program.
3. Students who fail the CE attempt must retake the CE the next time it is offered.
4. Students who fail the second CE attempt may petition the EECE Graduate Committee for approval to retake the exam at its next offering, for a third time. The petition to take the CE a third time should be made to the department chair who may approve it or forward the petition to the Graduate Committee for their consideration. This petition exhausts the student's right of appeal. *Students who fail a third CE attempt do not meet graduation criteria for the course option M.S. program, and their programs will be terminated.*

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Appendix A

Core Graduate Program Research Areas and CE/WQE Related Courses Marquette University Electrical & Computer Engineering Department

Required Foundation courses:

EECE 6010 Advanced Engineering Mathematics
EECE 6020 Stochastic Processes in Engineering

Core Research Areas

(Used as Primary and Related areas for the PhD Written Qualify Exam)

1. Signal Processing

Core course: EECE 5510 Digital Signal Processing
Related undergraduate course: EECE 5560
Related graduate courses: EECE 6510, 6520, 6530, 6540

2. Control Theory

Core course: EECE 6310 Modern Control Theory
Related undergraduate courses: ELEN 3020, EECE 5310, 5320
Related graduate courses: EECE 6320, 6330, 6340

3. Electromagnetic Fields and Waves

Core course: ELEN 3110, 3120 Electromagnetic Fields 1 & 2.
Related undergraduate courses: 5150, 5565
Related graduate course: EECE 6120

4. Power and Energy Systems

Core courses: ELEN 3210 Electric Drives and
EECE 5210 Design and Analysis of Motor Drive Systems
Related undergraduate courses: EECE 3210, 5210, 5220, 5230, 5240, 5250
Related graduate courses: EECE 6210, 6220, 6230

5. Solid-State Devices, Microsensors and MEMS/NEMS Systems

Core course: ELEN 4430 Physical Principles of Solid State Devices
Related undergraduate courses: EECE 5460, 5490
Related graduate courses: EECE 6430

6. Algorithms and Machine Learning

Core course: EECE 6810 Algorithm Analysis and Application
Related undergraduate courses: COEN 5650, 5850, 5860, 5870
Related graduate courses: EECE 6820, 6822, 6830, 6840

7. Embedded Systems and Computer Hardware

Core course: COEN 4710 Computer Hardware and COEN 4720 Embedded Systems Design Related
undergraduate course: COEN 4730