

**University of Massachusetts at Amherst**  
**Department of Electrical and Computer Engineering (ECE)**

**Ph.D. PRELIMINARY COMPREHENSIVE EXAMINATION POLICY**  
**(For ECE Grad students enrolled AFTER Fall 2003 semester only)**  
**REVISED 26 September 2006**

**I. Core Requirement**

Every Ph.D. student is required to choose and take one four (4)-course core curriculum (either EE or CSE option) while in residence at UMass-Amherst.

**A. Options**

1. **EE Option:** The student takes three (3) courses from the EE core and the fourth (1 course) from either the EE or CSE core (total of 4 courses)
2. **CSE Option:** The student takes three (3) courses from the CSE core and the fourth (1) from either the CSE or EE core (total of 4 courses)
3. **Course choices:**

**EE Core:**

1. ECE 603: Probability and Random Processes (Fall)
2. ECE 606: Electromagnetic Field Theory (Fall)
3. ECE 609: Semiconductor Devices (Spring)
4. ECE 608: Signal Theory (Spring)

OR

ECE 604: Linear Systems (Fall)

**CSE Core:**

1. ECE 665: Computer Algorithms (Spring)
2. ECE 658: VLSI Design Principles (Fall)
3. ECE 668: Computer Architecture (Fall)
4. CS 677: Operating Systems (Spring)

OR

ECE 697\_: Networking (Spring)

**Notes:**

1. Each of the ten (10) courses above will be offered once per year.
2. The student must complete the core requirement **within two (2) years (24 months) of entry into the program.**
3. Courses taken via distance learning program will not be counted as core.

**B. GPA and Grade requirements**

1. The student must obtain a **3.5/4.0 GPA** for the four (4) courses
2. While achieving a grade of **at least "B"** in each of the courses.

**NOTE:** There will be no exceptions granted (example: taking a similar course at another university does not grant an exemption).

**C. Completion of a core course (or multiple core courses) at UMass-Amherst with the required grade (minimum "B") as part of another degree:**

1. Such course/courses can be counted toward the core *with the grade counting towards the 3.5 required GPA in the core.*
2. For each such course, the student must take another 600-level course, either inside or outside the ECE department. These must be taken while in residence.
3. Each such course must be approved in writing for inclusion in the core requirement by the student's faculty advisor. The student need only have a C or better in these substitute courses.

## II. Research Qualifying Exam (RQE)

Every Ph.D. student must complete the *Research* Qualifying Exam, which will consist of the documentation and *oral* presentation of a research project under the direction of the student's advisor. *The purpose of the research qualifying exam is to test the student's ability to conduct independent research.*

### A. State of the research at qualifying exam should include:

1. a clear definition of the problem
2. a comprehensive understanding of the problem area (including related research)
3. preliminary results at the level of a conference or workshop paper.
4. the research work pertaining to the exam must be performed while the candidate is enrolled in the ECE Ph.D. or M.S./Ph.D. degree program.

### B. Committee

The student will demonstrate the above to a committee consisting of four (4) faculty members: the advisor, two (2) faculty members close to the research area (chosen by the advisor in consultation with the student), and one (1) faculty member within the department but significantly outside the research area (chosen by the Graduate Program Director). The student or the student's advisor makes a request to the GPD to initiate the process. A minimum of 2 weeks advance notice is required by the GPD to choose the external member. Up to one member can be from outside the ECE department. However, all four members must be faculty of UMass-Amherst.

### C. Documentation

The student will provide to the committee a four (4)-page two-column document in the standard conference format for their area. A copy of this document will also be provided to the ECE Graduate Program Office in 210 Marcus Hall for the student's permanent file.

### D. Oral Presentation

The student will give a 30-minute presentation describing their research work. After the presentation, the committee will ask questions: (a) directly about the research work (as would be typical at a conference), and (b) in the specific area of the research (to test the student's grasp of the problem area). The student is considered passed at the RQE if at least 3 out of 4 committee members vote to pass. The result of the exam will be communicated to the ECE Graduate Programs Office (ecegrad@ecs.umass.edu) by the committee member appointed by the GPD.

### E. Timelines

**The student must attempt the Qualifying Exam within 30 months of entry after having completed the core course requirements.** Failure to do so may jeopardize the student's candidacy. If the student fails the first attempt at the Qualifying Exam, he/she must take the exam a second (and last) time within three (3) months of that failure.

**Notes:** (1) There are no proposed changes to the dissertation prospectus/outline and dissertation defense process. (2) The previous breadth courses requirement is eliminated.