

**ELECTRICAL ENGINEERING PROGRAM**  
**DOCTORAL QUALIFYING EXAMINATION**  
**(Revised Fall 2007)**

(The exam is a CLOSED-BOOK, CLOSED-NOTES EXAMINATION.)

The examination will have two parts, each part is four-hours in duration. There will be **fourteen** (14) problems in **part I**, of which the student will be expected to answer **any ten** (10). There will be **eight** (8) areas in Part II and students will be asked to **select any two (2) at the time of signing up** for the examination. Each area on Part II of the exam will consist of 3-5 problems. The exam will be closed-book, closed-notes with no reference materials permitted. (Any reference tables or materials, if needed, will be provided as part of the exam.) Information on the topical and sub-topical distribution of the problems and related courses, which may be useful in preparation, is given below. A syllabus for each course is on file in the Electrical Engineering Departmental Office and is available on request. In addition, sample exams may be obtained from the Department.

**PART I**

1. Circuits and Electronics (4 questions)
  - EE – 301 Electrical Circuits I
  - EE – 305 Electrical Circuits II
  - EE – 330 Electronics I
  - EE – 335 Electronics II
2. Digital Logic and Microprocessors (2 questions)
  - EE – 354 Digital Logic
  - EE – 367 Introduction to Microprocessors
3. Electromagnetic Fields (2 questions)
  - EE – 361 Electromagnetic Fields
4. Energy Conversion (2 questions)
  - EE – 362 Electromechanical Energy Conversion
5. Mathematical Methods (4 questions)
  - EE – 234 Analytical Methods in Engineering
  - EE – 310 Signals and Systems
  - EE – 420 Random Signals and Systems

**PART II**

1. Applied Electromagnetics
  - EE – 461 Microwave Engineering
  - EE – 462 Antenna Theory
  - EE – 561 Microwave Solid-State Circuit Design
  - EE – 565 Optical Communication
2. Computer Engineering
  - CS – 458 Computer Architecture
  - CS – 536 Software Engineering
3. Control Systems
  - EE – 474 Control Systems Theory
  - EE – 574 Intermediate Control Systems
4. Electronic Circuits
  - EE – 451 VLSI Design
  - EE – 541 Integrated Circuits and Systems
  - EE – 562 Telecommunication Circuits
5. Power
  - EE – 471 Electric Power Systems
  - EE – 572 Power Electronics
  - EE – 573 Power System Planning
  - EE – 575 Analysis of Electrical Machinery and Motor Drives
6. Signal Processing and Communication
  - EE – 410 Principles of Discrete Systems and Digital Signal Processing
  - EE – 420 Random Signals and Systems
  - EE – 421 Communication Systems
  - EE – 429 Wireless Communication Systems
7. Biomedical Engineering
  - EE – 436 Medical Instrumentation
  - EE – 437 Introduction to Biomedical Imaging
8. Nano-Engineering
  - EE – 482 Introduction to Nanoelectronics
  - EE- 588 Introduction to Nanotechnology