

## **Ph.D. Preliminary Exam Policy Electrical and Computer Engineering**

The Ph.D. degree is awarded by the graduate faculty of the Electrical & Computer Engineering Department at Baylor University to candidates who have achieved an appropriate level of scholarly proficiency across the discipline. The candidate will have made substantive original research contributions in the field of electrical and computer engineering. These contributions must be clearly and effectively communicated both orally and in writing. In concert with the charter and heritage of Baylor University, ECE Ph.D.'s will be men and women of strong character.

Towards achieving these goals, the following procedures have been approved by the ECE graduate faculty.

### **Dissertation Committee**

The student is to form a Ph.D. committee according to graduate school rules, which are stated below:

**Dissertation Examining Committee Composition** The dissertation examining committee will include five members of the Baylor Graduate Faculty: the committee chairperson, two other Graduate Faculty members from the student's home department, and one additional Graduate Faculty member, either from the home department or outside, and a fifth member or "outside" member. The outside member must be a Graduate Faculty member whose primary faculty appointment is from a department other than the one conferring the student's degree. The student's mentor will serve as the chairperson of the committee and ensure that formal announcement of the examination is made, that the exam is conducted fairly, and that it is open to the faculty. The "official outside" member helps to ensure a consistent level of quality, rigor, and fairness across all graduate programs at Baylor University and may or may not be actively involved in the dissertation. The committee may include additional members (who are not necessarily members of the Graduate Faculty) beyond the minimum required number.

The preliminary exam will consist of a written and an oral portion. The written preliminary exams will cover three of the sub-disciplines of ECE listed in Table 1. An exam in a sub-discipline of the student's background may be substituted for one of the required ECE sub-disciplines for students with non-ECE backgrounds.

### **Preliminary Exam Planning Stage**

The Graduate Program Director, in consultation with the faculty and the student, will assign a faculty member to prepare a written exam for each of the sub-disciplines chosen by the student. The selected faculty member in each sub-discipline will provide the student with a list of discipline specific topics from which the exam will be composed. As an option, the student may select two or more courses listed in Table 1 as defining the domain of topics over which the written exam will extend. Table 1 will be amended from time to time as new focus areas are developed within the department and new graduate courses are approved.

The individual examining faculty member will work with the Graduate Program Coordinator to schedule and administer their specific written exam. If more than one

student is being examined, the schedule should provide for all the examinees to take the discipline specific exam at the same time.

If a student has a non-ECE background and chooses to take a preliminary exam over a sub-discipline from their background, the student's advisor will make a recommendation on the content areas to be covered by the written preliminary exam and a plan for implementing the exam. The student's graduate committee must approve the plan.

Students should complete the preliminary exam planning stage and schedule the exam by the time they complete 36 credit hours of course work beyond the bachelors degree. The student should prepare, and submit to the Graduate Program Director, a planning document that lists the three areas for the preliminary exam.

### **Written Preliminary Exam**

The student will be given three hours to complete the area specific exam, with one area specific exam given per day, unless the student agrees to take more than one exam on any given day. The faculty members that make the exams are responsible for grading the exams. The graded exams will be made available to the oral exam committee prior to the administration of the oral exam.

### **Oral Preliminary Exam**

An oral exam committee will be formed by the graduate director in consultation with the student's advisor. However, the student's advisor shall not be on the oral exam committee. The committee will consist of three faculty members, each representing a preliminary exam sub-discipline area. A faculty member in a given area need not be the faculty member administering the written exam for that sub-discipline. Each topic area will be allocated nominally 30 minutes, with an overall oral exam length of approximately 2 hours.

### **Schedule:**

The preliminary exam will be administered each year during the fall semester and at other times as may be required.

### **Results of the Preliminary Exam**

The oral exam committee is responsible for making a recommendation to the faculty about whether the student passed the preliminary exam for each of the areas. The recommendation will be one of three outcomes; pass, pass with remedial requirements, or fail. If a student fails one or more portions of the preliminary exam they will have one opportunity to retake the failed portions of the exam. When a student successfully completes the preliminary exam, they will be formally admitted to candidacy.

### **Dissertation Research Proposal**

Students who successfully complete the preliminary exam should present a dissertation research proposal within six months. The dissertation research proposal will consist of a public presentation of the student's proposed research plan. There will also be a questioning portion of the dissertation research proposal that is open only to ECE faculty and members of the student's committee. To be eligible to submit a dissertation research proposal the student must have submitted a peer reviewed paper (conference or journal) or a research proposal approved through the Baylor Office of Sponsored Programs for submission to an external funding agency. The supervising advisor's name should appear on the submitted document.

### **Results of the Dissertation Research Proposal Presentation**

The student's Ph.D. Committee is responsible for making a recommendation to the graduate faculty about whether the student has presented an acceptable dissertation research proposal. A simple majority vote of the graduate faculty is needed to confirm the results. The recommendation will be one of three outcomes; acceptable, acceptable with remedial requirements, or unacceptable. If a student's proposal is deemed unacceptable they will have a second opportunity to formulate and present an acceptable document.

Any deviation from this policy can be approved by a simple majority vote of the ECE graduate faculty.

Table 1: Preliminary Exam Areas (Adopted 08/17/2017)

Course	Course Name	Control Systems	Communications	Digital Systems	Software Systems	Image and Signal Proc.	Circuits and Networks	Microwaves, Antennas and Propagation, and Electromagnetics	Power Systems and Renewable Energy	Photonics	Devices, Materials, and Physics
ELC 4315	Electronic Design II						x				
ELC 4318	Avionic System Design			x	x						
ELC 4320	Introduction to Optics									x	x
ELC 4330	Introduction to Robotics	x									
ELC 4332	Automatic Control Systems	x									
ELC 4337	Solar Energy								x		
ELC 4340	Power Systems								x		
ELC 4345	Power Electronics						x		x		
ELC 4350	Principles of Communication		x								
ELC 4351	Digital Signal Processing				x	x					
ELC 4353	Image Formation and Processing					x					
ELC 4360	Software Systems				x						
ELC 4362	Wireless Sensor Networks		x	x			x	x			
ELC 4372	Bioinstrumentation						x				
ELC 4377	Solar Energy								x		
ELC 4381	Antennas and Wireless Propagations							x			
ELC 4383	RF/Microwave Circuits I						x	x			
ELC 4384	RF/Microwave Circuits II						x	x			
ELC 4438	Computer Systems Design			x							
ELC 5311	Advanced Logic Design			x							
ELC 5313	Advanced Computer Architecture			x							
ELC 5316	Real-Time Systems Design			x	x						
ELC 5330	Advanced Robotics	x									
ELC 5336	Advanced Engineering Electromagnetics							x		x	x

