

# GRADUATE HANDBOOK

for the

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

LOUISIANA STATE UNIVERSITY

Baton Rouge, LA 70803

This handbook gathers into one place most of the academic regulations of the Graduate School and the Department of Electrical and Computer Engineering as they affect graduate students working toward either M.S. or Ph.D. degrees in electrical engineering. This handbook is directed toward faculty advisers and students alike.

**Graduate students must assume full responsibility for the knowledge of rules and regulations of the Graduate School and the Department concerning their individual degree programs.** It is not expected that graduate students require any such degree of paternal guidance as is commonly given to undergraduates. The purpose of this handbook is to help make the student's path through the academic jungle of red tape as clear and effortless as possible.

## TABLE OF CONTENTS

	Page
1. GENERAL INFORMATION. . . . .	.3
1.1 Full-time Status . . . . .	.3
1.2 Course Loads . . . . .	.3
1.3 Final Semester Course Load . . . . .	.3
1.4 Grade Requirements . . . . .	.3
1.5 Assistantships . . . . .	.4
1.6 The Graduate Study Committee . . . . .	.4
1.7 Academic Advising. . . . .	.4
1.8 Major Professor. . . . .	.4
1.9 Plan of Study. . . . .	.4
1.10 Minor in Electrical Engineering. . . . .	.5
2. REQUIREMENTS FOR THE M.S. DEGREE . . . . .	.6
2.1 Time Limitation. . . . .	.6
2.2 Transfer and Extension Credit. . . . .	.6
2.3 Nonstandard Backgrounds. . . . .	.6
2.4 The M.S. Plan of Study . . . . .	.7
2.5 Study Programs . . . . .	.7
2.5.1 Thesis Option. . . . .	.7
2.5.2 Non-Thesis Option. . . . .	.7
2.6 Thesis . . . . .	.8
2.7 Master's Examination & Examination Committee . . . . .	.8
2.7.1 Details of the Written Examination . . . . .	.9
2.8 Summary of Necessary Steps . . . . .	.10
3. REQUIREMENTS FOR THE PH.D. DEGREE. . . . .	.11
3.1 Residence Requirement. . . . .	.11
3.2 Qualifying Review. . . . .	.11
3.3 The Ph.D. Plan of Study. . . . .	.12
3.4 Advisory Committee . . . . .	.12
3.5 Study Program. . . . .	.13
3.6 General Examination. . . . .	.13
3.7 Time Limitation. . . . .	.14
3.8 Dissertation . . . . .	.14
3.9 Final Examination. . . . .	.15
3.10 Certification. . . . .	.15
3.11 List of Major Steps. . . . .	.16

### 1. GENERAL INFORMATION

Some regulations pertaining to graduate study are fixed by the Graduate School; others are left to the discretion of

the individual departments. Rules and regulations as printed in the *LSU General Catalog* are official and they must always be followed. **Students will be governed by the rules in the *Graduate Handbook* in force at the time their plans of study are approved.**

#### 1.1 Full-time Status

A "full-time" graduate student is one who in the opinion of the dean of the Graduate School is fully committed to graduate study and who devotes no appreciable time to any duties not directly related to his graduate work. Full-time status does not depend solely on the number of hours for which a student registers, although it is normally expected that a full-time graduate student will take a least nine semester hours of work. Graduate assistants are considered full-time students and are expected to register for a full load of graduate courses each semester until all degree requirements are completed.

#### 1.2 Course Loads

Maximum registration for a graduate student is 15 hours of coursework in any one semester. The maximum course load for a summer term is nine hours. The maximum load for a graduate assistant employed half-time is 12 hours per semester or six hours per summer term.

#### 1.3 Final Semester Course Load

Students completing requirements for an advanced degree must be registered for at least six hours of graduate credit during the semester or summer in which requirements are completed and the degree is conferred.

#### 1.4 Grade Requirements

To receive a graduate degree a student must have at least a 3.0 average on all work taken while registered as a graduate student. Students will be dropped from the rolls if either their cumulative average or their semester average is below 3.0 for two consecutive semesters. For these purposes a summer session is counted the same as a semester.

#### 1.5 Assistantships

A number of teaching and research assistantships are available to qualified students. Requests for information should be made directly to the department Graduate Adviser.

Only students with acceptable academic records may be appointed to graduate assistantships. A student on probation does not qualify for an assistantship.

#### 1.6 The Graduate Studies Committee

The Graduate Studies Committee (GSC) is responsible for the formulation of policy regarding those matters of graduate study over which the department retains control. The Committee approves all plans of study and oversees degree requirements. A student has the right to petition the Committee for a reexamination of rules and regulations on an individual basis. All such petitions must be in writing.

#### 1.7 Academic Advising

Every student has a faculty advisor to assist her/him in all pertinent academic issues, such as the planning of course schedules, and selecting a research area and major professor.

During the first semester in residence, students are normally advised by the departmental area coordinator appropriate to the student's interest. With the help of the area coordinator, students must select an advisor (from the graduate faculty) before they are permitted to register for the second semester.

#### 1.8 Major Professor

The major professor will act as the chair of the student's examining committees and direct thesis and dissertation research. The major professor must endorse the plan of study submitted by the student to the GSC and the Graduate School.

#### 1.9 Plan of Study

In order to facilitate departmental planning and to assure that graduate students have a well defined study program, it is necessary that each graduate student submit a plan of study to the GSC. The plan of study must be signed by the student's major professor before being submitted to the GSC for approval. The proper forms are available in the departmental graduate office.

The plan of study is not a binding contract and may be changed from time to time in consultation with the major professor and the GSC.

#### 1.10 Minor in Electrical Engineering

Graduate students from outside the department desiring a minor in electrical engineering must take at least nine units for graduate credit. For a Ph.D. student six or more units must be of 7000 level; for an M.S. student a minimum of three units of 7000 level is required. The program must be approved by the Graduate Studies Committee.

The Department of Electrical and Computer Engineering does not require a separate examination for students minoring in electrical engineering.

## 2. REQUIREMENTS FOR THE M.S. DEGREE

Both thesis and non-thesis options are available for the M.S. degree. Students are encouraged to elect the thesis option. Each candidate for a master's degree is required to pass a comprehensive final examination (see Sec. 2.7).

An M.S. candidate is expected to have a good general knowledge of his field of specialization and a reasonable competence in the research skills used in his field. To graduate a student must, apart from the requirements mentioned below, achieve a 3.0 or higher GPA on all electrical engineering courses that are applied towards his graduate degree.

### 2.1 Time Limitation

Programs must be completed within five years. Credit for individual courses taken more than five years before the termination of a program, however, may be validated by passing the equivalent of a final examination in each course. The results of such examinations must be certified by the professor under whom the examination was taken, the student's committee, and the chairman of the department. Any such examination must be reported to the Graduate School before the request for final examination can be approved.

### 2.2 Transfer and Extension Credit

A total of nine hours of extension and/or transfer credit may in some cases be used in a master's degree program if approved by the chairman of the department and the dean of the Graduate School. To petition for transfer credit the student must have completed his first nine hours of graduate residence at LSU.

### 2.3 Nonstandard Backgrounds

Candidates for an M.S. degree with non-electrical engineering B.S. degrees may be required to complete remedial work in electrical engineering as specified by their major professor.

Because M.S. candidates are expected to have an appropriate background in electrical engineering, all students with non-electrical engineering B.S. degrees will be required to take most of their coursework in the Department of Electrical and Computer Engineering (see Section 2.5).

### 2.4 The M.S. Plan of Study

The M.S. Plan of Study must be submitted shortly after the selection of a major professor. No student with 15 or more hours of credit will be allowed to register for further work without an approved plan of study. Courses at the 4000 level which are required in the B.S. degree program at LSU are generally not acceptable for graduate credit.

Every student is required to have an M.S. examination committee that includes at least two graduate faculty members from ECE.

## 2.5 Study Programs

The department offers two M.S. degree programs described in the following subsections. All coursework must be approved by the major professor and the GSC. Changes from one program to another may be made at any time with the approval of the student's major professor and the GSC.

### 2.5.1 Thesis Option

The maximum credit permitted at the 4000 level is 12 hours. At least 12 hours of coursework must be from permitted 4000 and 7000 level courses other than EE 400X, EE 470X, EE 7X00, EE 709X, and other independent study/seminar/special topics courses. The minimum requirements are:

EE 8000 (thesis)	6 hours
EE 7XXX *	12
Suitable electives <sup>+</sup>	<u>12</u>
	30 hours

\* May include three credits of EE 709X.

+ In addition, students with a B.S.E.E. degree may take at most 12 hours outside the department; other students may take at most six hours.

### 2.5.2 Non-Thesis Option

The maximum credit permitted at the 4000 level is 12 hours. At least 18 hours of coursework must be from permitted 4000 and 7000 level courses other than EE 400X, EE 470X, EE 7X00, EE 709X, and other independent study/seminar/special topics courses. The minimum requirements, which may include a maximum of six hours of EE 709X, are:

EE 7XXX*	15 hours
Suitable electives <sup>+</sup>	<u>21</u>
	36 hours

\*EE 709X can not be used to satisfy the EE 7XXX requirements.

+In addition, students with a B.S.E.E. degree may take at most 15 hours outside the department; other students may take at most six hours.

## 2.6 Thesis

The thesis is a substantial study bearing on a clearly defined problem of limited scope. It must be acceptable in subject matter and exhibit creditable literary workmanship. Instructions on preparation and submission of theses can be obtained at the Graduate School.

Final acceptance of the master's thesis rests with an examination committee of three or more members who are nominated by the chair of the department and are appointed by the dean of the Graduate School. The major professor is designated chair of this committee.

Each student must submit a final copy of his thesis to the members of his committee no later than 10 days prior to the day set for the final examination.

## 2.7 Master's Examination & Examination Committee

Every student is required to have an M.S. examination committee that includes at least two graduate faculty members from ECE.

For students pursuing the thesis option the comprehensive final examination consists of an oral defense of the thesis and affiliated coursework. M.S. exam committee serves as the M.S. thesis committee.

For students in the non-thesis option the comprehensive final examination consists of a written examination. This examination is normally taken during the last semester of M.S. coursework. Students who fail the written examination two or more times must request permission from the GSC before they can take it an additional time.

**A student who has passed the written comprehensive examination but did not graduate in the semester in which the examination was passed, must take and pass an oral M.S. final examination administered by the student's M.S. committee, in the semester the student wants to graduate.**

Details of the written examination are given below.

### 2.7.1 Details of the Written Examination

The examination is administered by the GSC once in the fall and once in the spring. All student work is identified only by a tag assigned when the student registers for the exam assuring anonymity.

The examination is closed book and closed notes with a 4 hour time limit. The examination consists of 40 questions, five questions from each of the following eight subjects:

- automatic control
- circuits and systems
- communications and signal processing
- computer hardware
- computer software
- computer applications
- physical electronics
- power

A student must work a total of six problems. The decision on the outcome of the exam is made by the graduate faculty.

Dates and additional details will be timely posted by the GSC.

## 2.8 Summary of Major Steps

The following is a brief summary of the necessary steps for the M.S. degree. The steps are listed in sequence.

1. Initial counseling by an area coordinator
2. Select a major professor
3. File a departmental Plan of Study which must be approved by the major professor and the Graduate Studies Committee
4. File\* an Application for Admission to Candidacy (application for the degree)
5. File\* request for the final examination
6. Submit\* thesis to examining committee<sup>+</sup>
7. Take the final examination
8. Submit\* approved thesis to the graduate school<sup>+</sup>.

---

\* Final date is given in the *General Catalog* calendar.

<sup>+</sup> Thesis option only.

### 3. REQUIREMENTS FOR THE PH.D. DEGREE

The Ph.D. candidate must show that he has a broad factual and theoretical background in his chosen subject, an authoritative knowledge of his special field of research, a thorough grasp of research methods and sound critical judgment. The degree is conferred only for work of distinction in which the candidate displays decided powers of original scholarship and only in recognition of achievement and marked ability. In no case is the degree awarded solely on the basis of study, however intense, extending over any prescribed period of time or in recognition of faithful performance of prescribed work. There are three basic hurdles: qualifying review, general examination and final examination.

#### 3.1 Residence Requirement

One full academic year of continuous residence as a full-time student must be earned at LSU after successful completion of the qualifying review. See the *General Catalog* for details.

#### 3.2 Qualifying Review

Each doctoral student wishing to pursue a Ph.D. degree is reviewed by the graduate faculty with regard to his or her abilities to complete a doctoral program. The process is initiated by the student taking the written examination (see Sec. 2.7.1) with the following two constraints:

1. Students must declare a major area of concentration from among the following four major areas:

- Computer Engineering
  - hardware
  - software
  - applications
- Electronics
  - circuits and systems
  - physical electronics
- Power
- Systems
  - automatic control
  - communication and signal processing

2. Students must work at least five problems out of the required six problems in their major area. Student can work problems from any of the subjects listed under the area.

The qualifying review considers the performance on the written examination, all academic records, input from the faculty and other appropriate sources. The decision concerning passing or failing of the qualifying review will be made by the graduate faculty. Students can take the written examination at any date that it is offered, but no more than two times in their program. Students coming into the program with an M.S. degree must take the written examination within the first two semesters of being admitted, or before completing 18 hours of graduate work.

Students deemed not qualified and wishing to continue in the program must take the written examination again and request a second review. The second and final review must take place within one year of the first review.

### 3.3 The Ph.D. Plan of Study

A student, counseled by his advisory committee, must formulate a plan of study which, after having been approved by the advisory committee, should be submitted to the GSC as soon as possible after passing the qualifying review. Counseling to the student and approval of the plan of study by the advisory committee should only be given after ascertaining the student's strengths and weaknesses.

### 3.4 Advisory Committee

During the entire period of work toward the doctorate, starting the semester after an applicant passes the qualifying review, the student's program is directed by a special advisory committee. In the early stages, this committee consists of three members. After the program has assumed a more definite form and the direction of research has been clearly established, this committee is enlarged from three to five or more members. This enlargement must take place prior to the general examination. The full advisory committee consists of the major professor who acts as chairman, one or more representatives of at least one minor field, and at least three other members. The members of the full advisory committee are nominated by the major professor and approved by the GSC.

### 3.5 Study Program

The study program must include a minimum of 48 hours of coursework above the B.S. degree. All coursework must be approved by the GSC. Dissertation research (EE 9000) can be taken only after passing the qualifying review.

The student must identify a major area of study in the department and an outside minor field. Possible major areas are listed in Section 3.2.

The minimum credit requirements are:

Major Area:	EE 7XXX	15 hours
Outside Minor:		9
Approved Electives:		<u>24</u>
		48 hours

At least 24 hours of coursework must be from permitted 4000 and 7000 level courses other than EE 400X, EE 470X, EE 7X00, EE 709X, and other independent study/seminar/special topics courses.

The minor field of study must be chosen to support the major area and must include at least three hours of 7000 level credit. Individual minor programs are subject to approval by the advisory committee and the minor department.

The program of study may include a maximum of 15 hours of 4000 level courses and three hours of EE 709X. 4000 level courses which are required in the B.S. degree program at LSU are generally not acceptable for graduate credit.

Students joining the Ph.D. program with an M.S. degree may petition the GSC to have part, or all, of the coursework taken for the M.S. degree applied towards the Ph.D. requirements. The petition cannot include M.S. thesis work or individual study courses.

Students working towards the Ph.D. degree who satisfy the requirement in Section 2.5.2 may apply for an M.S. degree while pursuing the Ph.D. degree. The granting of the M.S. degree will have no bearing on the Ph.D. study program.

### 3.6 General Examination

The student becomes eligible to take the general examination after demonstrating to the advisory committee adequate academic and professional aptitudes.

The general examination is the most severe test in the entire program for the doctorate. It is comprehensive enough to demonstrate expert competence over broad segments of the major field and a high degree of familiarity with the content and current progress in one or more minor fields. The examination should be regarded as the culmination of the student's program in coursework. In most cases the remainder of the time spent in obtaining the degree is devoted to concentrated work on the dissertation and preparation for the final examination.

The student initiates the process by preparing a written document outlining his proposed research. Once this research prospectus is approved by the student's major professor, a copy must be delivered to the department's graduate office and the student can request a date for the examination. At this time, the advisory committee must assume its definite form with five or more members, including the Graduate School dean's representative (see Section 3.4). The advisory committee decides the outcome of the examination, which is pass or fail.

The examination is a defense of the research prospectus and may be oral, written, or oral and written according to the examining committee. The examination is open to members of the graduate faculty. The examination may include any question deemed appropriate by the committee or faculty.

### 3.7 Time Limitation

No less than one academic year must elapse and no more than four calendar years may elapse between the passing of the general examination and the completion of all requirements for the Ph.D. degree. Except by special permission of the Graduate Council, a student who exceeds the four-year time limit must repeat the general examination; he is not, however, required to wait for the lapse of an academic year between the passage of the second general examination and the final oral examination.

### 3.8 Dissertation

A candidate must prove his ability to complete a significant program of original research by preparing an acceptable dissertation. The dissertation must be an original and significant contribution to knowledge and must be presented with considerable literary skill.

### 3.9 Final Examination

A request for the final examination must be submitted to the Graduate School through the department chairman at least three weeks prior to the proposed date, and in no case less than five weeks prior to the final date for submission of approved dissertations. The request for the final examination must specify the major and minor fields, the dissertation title, the time and place proposed for the examination, and nominations for the examining committee.

Permission for holding the final examination will be granted by the dean of the Graduate School only after all the foregoing conditions are satisfied and one academic year has elapsed since the student passed the general

examination. "One academic year," in this case, is the interval between a general examination held early in one term and final examination held toward the close of the following term.

The final examination committee will be appointed by the dean of the Graduate School. In most cases it will consist of the student's advisory committee, or a similarly constituted group, to whom one or more additions may be made as representatives of the Graduate Council. The committee must have copies of the dissertation at least two weeks prior to the final examination.

The final examination is an oral test which is concerned primarily with the dissertation and related problems. The content may be varied in any way the committee decides and may extend into subject matter related to major and minor fields even though well removed from topics suggested by the dissertation.

### 3.10 Certification

Upon passing the final examination, with not more than one member of the committee dissenting, the candidate will be certified to the Board of Supervisors by the dean of the Graduate School as having fulfilled all requirements for the degree of Doctor of Philosophy.

### 3.11 List of Major Steps

The following is a brief summary of the steps for the Ph.D. degree.

1. Pass the qualifying review
2. Select a major professor
3. Prepare a Plan of Study, which must be approved by the student's advisory committee and the ECE Graduate Studies Committee (request form from EE Graduate Office)
4. Obtain, at the same time as item #3, approval of coursework in minor field by minor department
5. File approved program of study with the Graduate School (request form at Graduate School)
6. File a request for the general examination (request form at Graduate School)
7. Submit a Research Prospectus to the advisory committee
8. Take the general examination
9. File\* application for degree
10. Submit\* dissertation to examining committee
11. File\* a request for final oral examination
12. Take the final examination
13. Submit\* examination report and approved dissertation to Graduate School.

---

\* Final date is given in the *General Catalog* calendar.