

# **Electrical Engineering Graduate Student Handbook**



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## 1. INTRODUCTION

This handbook delineates the rules under which graduate programs in the Electrical Engineering (EE) Department operate. All graduate students are expected to become familiar with the policies and procedures of the Department as set forth in this handbook and to abide by them. The students should note that the general rules of the Graduate School are also applicable, and that each student is responsible for reading and observing the rules, procedures, and deadlines as set forth in the University of South Carolina (UofSC) Graduate Studies Bulletin

<https://academicbulletins.sc.edu/graduate/>

Electrical Engineering specific bulletin is at

<https://academicbulletins.sc.edu/graduate/engineering-computing/electrical-engineering/#text>

This handbook is divided into the following sections—Applying for Graduate Study, the Department, Graduate Degrees in EE, Academic Regulations, Financial Aid, Miscellaneous Policies.

## **2. APPLYING FOR GRADUATE STUDY**

### **2.1 APPLICATION SUBMISSION**

Application to our graduate program must be submitted through online application systems for which the links are provided below.

The online application is available at:

<https://engineeringcas.liaisoncas.org/apply/>

Electronic forms can be obtained at: <http://gradschool.sc.edu/forms/>

### **2.2 APPLICATION REQUIREMENTS**

Applicants to the graduate programs are required to apply for the respective degree programs within the specified deadlines and submit the following items for review and consideration. Incomplete applications will not be reviewed.

**Transcripts** of all previous college-level study e.g., bachelor's, master's etc.

**Letters of recommendation** from at least two persons who are qualified to judge the candidate's academic potential to successfully complete the degree they are applying for.

**GRE** scores are required by ALL applicants. The scores must be submitted to the Graduate School. Students who have obtained a BS degree from the University of South Carolina and are applying for the ME program are exempt from the GRE requirement.

**Application fee** of \$108.00

In addition to the above listed items, certain other materials may be required as detailed below.

**TOEFL/IELTS/PTE** test scores are required of all students whose native language is not English. This requirement may be waived for students who have received their undergraduate degrees from a university in an English-speaking country, e.g., Australia, Canada, the United Kingdom.

Applicants to the M.S. and the Ph.D. programs should write and submit a short statement (not more than 1 page) of their own describing their research area of interest so that their application file can be forwarded to the appropriate faculty member(s) for evaluation.

**2.3 APPLICATION DEADLINES**

To receive full consideration all necessary application materials should be received by the dates given below. Applications received from United States (US) citizens, permanent residents, and others residing in the US may be submitted and reviewed after these dates as long as there is enough time for the department to review and make a determination on admission suitability before the semester starts. Please contact the department in case there are questions.

([https://sc.edu/study/colleges\\_schools/engineering\\_and\\_computing/departments/electrical\\_engineering/our\\_academics/index.php](https://sc.edu/study/colleges_schools/engineering_and_computing/departments/electrical_engineering/our_academics/index.php))

<b>For admission for the</b>	<b>Preferred Application Deadline</b>
Fall Semester	March 1
Spring Semester	September 1

### 3. THE DEPARTMENT

#### 3.1 ORGANIZATION

The Chair of the Department oversees all operations of the department. The Graduate Director chairs the Department's Graduate Committee that is responsible for supervision of the departmental graduate degree programs. The Graduate Committee reviews applications for graduate study, makes recommendations regarding admission and financial aid, oversees the progress of graduate students, and recommends degree requirements to the faculty of the department.

Detailed information about each faculty member, including research interests and contact information, can be found at the following website:

[https://sc.edu/study/colleges\\_schools/engineering\\_and\\_computing/departments/electrical\\_engineering/our\\_people/index.php](https://sc.edu/study/colleges_schools/engineering_and_computing/departments/electrical_engineering/our_people/index.php)

## 4. GRADUATE DEGREES IN ELECTRICAL ENGINEERING

### 4.1 PHILOSOPHY OF GRADUATE STUDY

The graduate programs of the Department serve to assist the student in his/her quest for advanced knowledge in specific fields of interest. This goal is achieved through close interaction between the faculty and the student during a challenging course of study comprising classroom, individual study, and research segments (for M.S. and Ph.D.). In order to successfully meet the requirements of the graduate program, a student must be adequately prepared. Specific requirements for admission to the various programs are given in the following sections, but, as a general rule, the student is expected to be well-versed in the basic sciences, mathematics, language skills, and electrical engineering principles. Normally, an undergraduate degree in Electrical Engineering is required, although exceptional students with other backgrounds will be considered for admission.

### 4.2 MASTER OF SCIENCE DEGREE PROGRAM (M.S.)

#### 4.2.1 Admission Requirements

Students may be accepted into the Master of Science degree program with a *regular admission* or a *conditional admission*.

M.S. Students are strongly encouraged to identify their area of potential concentration or focus when applying for admission. As an internal policy, the Electrical Engineering Department only accepts MS students if a faculty member agrees to serve as the student's advisor for their thesis preparation work prior to their admission into the program.

#### Regular Admission

Admission is competitive and students meeting the following minimum requirements may be considered for regular admission to the M.S. program. Meeting these requirements, however, should not be construed as being sufficient for acceptance.

- A B.S. degree in Electrical Engineering with an average of B (3.0 / 4.0) or better on all work completed.
- Satisfactory GRE scores (at least 153 verbal, 155 quantitative, 3.0 analytical writing)
- At least two (2) satisfactory letters of recommendation.
- For students whose native language is not English, a TOEFL score equal to or greater than 80, IELTS international Academic Course Type 2 minimum score 6.5 or higher, or PTE Academic score of 53 or higher. Students are exempt from taking the TOEFL exam if they received their undergraduate degree from a university in an English-speaking country.
- Please refer to the International Applicants page on the Graduate School website:
- [https://www.sc.edu/study/colleges\\_schools/graduate\\_school/apply/international\\_applicants/index.php](https://www.sc.edu/study/colleges_schools/graduate_school/apply/international_applicants/index.php)

### Conditional Admission

Conditional admission is granted only in exceptional circumstances to applicants who show promise for success in the M.S. program, despite not meeting all of the regular admission requirements. Conditionally admitted students must satisfy all of the conditions of their admission prior to being admitted to degree candidacy.

#### 4.2.2 Supervision

An M.S. student must have an advisor or thesis director who have agreed to supervise their M.S. thesis. No M.S. student will be admitted without a faculty advisor from the departmental faculty agreeing to serve as the thesis director for the student's thesis. This condition applies whether the student applies and receives financial aid or not e.g., self-funded, foreign scholarship funded etc. For students who work on research projects the advisor may be the faculty member whose project the student is working on. Each student, with the assistance of their advisor, must ensure the formation of the thesis committee which normally requires two members, the advisor who serves as the thesis director and a second committee member from the department faculty. The thesis committee must approve the student's program of study (POS). It is important that the student discusses their POS with their thesis advisor at the earliest opportunity.

#### 4.2.3 Degree Requirements

The M.S. degree program requires, at a minimum, 24 hours of graduate coursework and 6 hours of thesis preparation. Note that the 6 hours of thesis preparation requires conducting advisor directed research, writing an M.S. thesis and defending that thesis.

The POS, which defines each student's particular degree plan, must be approved by his or her thesis advisor and by the Graduate Director. Specific degree requirements are set forth below. UofSC undergraduates may be able to complete their M.S. degrees in about 5.5 years if they take advantage of the accelerated master's program. If eligible, students who participate in the accelerated master's program already fulfill 12 hours of coursework while they are undergraduates. Thus, they will be required to complete the remaining 18 credit hours of which 6 hours will be the ELCT 799 after being admitted to the graduate program.

## **COURSES**

A minimum of 30 hours of graduate coursework/thesis prep. are required to obtain an M.S. degree. See Table 1 below. Up to six (6) hours of ELCT 799 – Thesis Preparation are counted towards the 30-hour requirement. Out of the remaining 24 hours at least 12 hours must be completed in a selection of ELCT courses at the 700 level or above. Six (6) credits of the 12 mentioned above may be fulfilled by taking ELCT 897 – Directed Individual Study. Nine (9) credits of the remaining hours have to be taken at the ELCT 500 level or above and the remaining three (3) credits can be taken from any other field deemed appropriate by the student's thesis advisor at the 500 level or above. All courses applicable to the degree should be specified in the POS as noted below.

**Table 1: M.S. Degree Requirements**

ELCT 5XX	Any non-ELCT Course Approved by Advisor at 5xx level or higher	ELCT 897 (Directed Individual Study)	ELCT 7XX or above	ELCT 799 (Thesis Prep.)
(12 or 9) hours	(0 or 3) hours	(6 or 0 hours)	(6 or 12) hours	6 hours

Normally, students will begin their program of studies by taking 5XX level courses followed by 7xx and 8xx courses and thesis preparation. Students who have already completed 12 hours of 5xx level coursework through their accelerated M.S. program or those who have applied for and received transfer credits may start with 7xx and 8xx courses and thesis preparation.

Courses are usually recommended by the student's thesis advisor or committee according to the area of specialization selected by the student. Areas of specialization include Power and Energy Systems, Communications and Electromagnetics, Electronic Materials and Devices, and Decision and Control.

**Program of Study (POS).** Each student is required to define a POS prior to completion of his or her first year of enrollment in the program. The POS represents a plan of action, which, when successfully implemented, will bring the student to his/her desired degree objective. The POS serves to protect the student in case of change of faculty and facilities planning on the part of the student and the Department. Changes on the POS can be made, but the student should not deviate from the POS currently on file. Alterations must be approved by the student's thesis advisor and by the Graduate Director.

**Transfer Credit.** No more than 12 hours of graduate credit may be transferred from other institutions for credit toward a degree. Grades of B or better are required on all transfer credits. Transfer credits must be approved by the Graduate Director and by the Dean of the Graduate School. Approval for transfer does not guarantee acceptance of the courses in the student's degree program. The degree program must be approved separately by the student's thesis advisor. Credits transferred from other institutions are subject to the six-year limit on age, and no mechanism exists for revalidating over-age transfer credits.

**Revalidation of Courses.** All courses applicable to the degree must be completed within a period commencing six years prior to the date of graduation. It may be possible to revalidate over-age courses in some instances. All petitions for revalidation should be directed to the graduate committee via the graduate director. Specific forms for this purpose are available from the Graduate School.

## MS THESIS

As indicated in Table 1 an M.S. student is required to register and complete 6 hours of thesis preparation which entails conducting advisor directed research, writing a thesis and then defending that thesis through an oral defense. The thesis shall be based on research work of current relevance to the EE field and of such a nature that the results are publishable in a major journal or presentable at a major conference in the field of specialization.

**Thesis Committee.** In consultation with his/her thesis advisor, the student should select a committee to oversee his/her thesis research. This committee should consist of no fewer than two members of the faculty (including the thesis advisor). Members of committee must be specified on the *Master's Thesis Committee and Thesis Topic* form.

**Enrollment in Thesis Preparation.** Students undertaking thesis work must be enrolled officially for thesis credit during every semester in which they use university facilities or confer with faculty about their thesis. A student's enrollment in **ELCT 799** should reflect the level of effort of both the student and his/her advisor.

**Thesis Defense.** All candidates for the Master of Science degree will make a public presentation of their thesis work. The allowable duration of the thesis presentation and the questioning of procedures will be specified by the presentation and assessment chair. Following the presentation, the chair of the assessment committee will moderate a 15-minute discussion period in which the audience may participate. At the conclusion of the discussion period, the audience will be excused so that the final, oral examination may be conducted. If, at the time of the assessment, the committee finds that any changes to the thesis are required, then the chair of the assessment committee is responsible for ensuring that the proper changes are made before final electronic submission to the Graduate School. A notice that the thesis presentation and comprehensive assessment have been scheduled must be placed on the graduate student bulletin board as well as sent via e-mail at least one week prior to the scheduled date of the final assessment. The notice should follow the form given in the Appendix/Forms.

**Completion of Thesis.** The thesis research and the text of the thesis are to be completed under the direction of the thesis committee. Generally, a student should submit a draft of his/her thesis to his/her advisor for comments before submitting a more polished version to the committee. The student should exercise appropriate judgment to ensure the timely completion of the thesis well before the end of the semester in which he/she intends to graduate. Normally, the student must plan ahead before she/he intends to defend their thesis. In general, submission of the thesis to the student's committee member several weeks before the date of the defense is required for committee members to review the thesis. The format for the title page of the thesis is given in the Appendix and must be followed closely. The Graduate School requires all theses to be submitted electronically. Detailed information regarding electronic submission is available on their website: <http://gradschool.sc.edu/students/thesisdiss.asp?page=acad&sub=etd>

## Comprehensive Assessment

Each candidate for the Master of Science degree must pass a comprehensive assessment. The format of the assessment will be determined based on an agreement of your thesis committee.

- A Thesis committee needs to be formed no later than 3 months prior to the proposed defense date. It is strongly suggested that the committee be formed immediately after the student submits his/her form for graduation at the beginning of the semester.
- The Thesis committee will administer the comprehensive assessment as part of the Thesis defense.
- Questions will not be directly related to any course materials but will be more research oriented aimed at assessing the student's *ability to apply knowledge of science and mathematics to solving electrical engineering problems.*
- The committee will fill out an evaluation form which will contain the scores for the assessment and will indicate whether the student has passed or needs to retake the assessment. *Students can only take the comprehensive assessment twice.*
- A photocopy of all written responses will be stored in the department as a part of the academic records.
- ***As per current Graduate School regulations, students must pass the comprehensive assessment 60 days prior to their graduation.***

M.S. students are normally not permitted to take ELCT 797 (Research).

### 4.3 MASTER OF ENGINEERING DEGREE PROGRAM (M.E.)

The Master of Engineering (M.E.) degree is a non-thesis graduate degree and thus a faculty advisor is not needed. Students interested to pursue an M.E. degree will not need to conduct any research work or write and defend an M.S. thesis. UofSC undergraduates may be able to complete an M.E. degree in about 5 years if they take advantage of the accelerated master's program. If eligible, students who participate in the accelerated master's program already fulfill 12 hours of work while they are undergraduates. Thus, they will be required to complete 18 credit hours of coursework after being admitted to the graduate program. M.E. students normally do not receive departmental or university financial aid except for exceptional circumstances. Only limited partial assistantships may be available for such students. M.E. students can be self-funded, on scholarships/fellowships, supported by their employers or self-funded.

#### 4.3.1 Admission Requirements

Students may be accepted into the Master of Engineering degree program with a regular admission or a conditional admission.

### Regular Admission

Admission is competitive. Students meeting the following minimum requirements are eligible for regular admission but meeting these requirements should not be construed as a guarantee of acceptance.

- A B.S. degree in Electrical Engineering with an average of B (3.0/4.0) or better on all work completed.
- For students whose native language is not English, a TOEFL score equal to or greater than 80, IELTS international Academic Course Type 2 minimum score 6.5 or higher, or PTE Academic score of 53 or higher. Students are exempt from taking the TOEFL exam if they received their undergraduate degree from a university in an English-speaking country.
- Please refer to the International Applicants page on the Graduate School website: [https://www.sc.edu/study/colleges\\_schools/graduate\\_school/apply/international\\_applicants/index.php](https://www.sc.edu/study/colleges_schools/graduate_school/apply/international_applicants/index.php)
- At least two (2) satisfactory letters of recommendation.
- For students whose native language is not English, a score of 80 or 570 (230 computer-based score) or better on the TOEFL examination depending on the test format. Students are exempt from taking the TOEFL exam if they received their undergraduate degree from a university in an English-speaking country.

### Conditional Admission

Certain applicants may show promise for success in the M.E. program, despite not meeting all of the requirements for regular admission. These students may be admitted conditionally. Under a conditional admission, a student may be allowed to take only a limited amount of graduate course work before satisfying the conditions of his/her admission.

#### 4.3.2 Supervision

The M.E. student's initial contact person will be the Graduate Director. After the initial meeting, the Graduate Director will recommend an advisor for the student, in keeping with the student's interests and faculty commitments.

#### 4.3.3 Degree Requirements

The Master of Engineering degree program comprises 30 hours of graduate coursework; a thesis is not required. The program of study, which defines each student's particular degree plan, must be approved by the Graduate Director. Specific degree requirements are set forth below.

## **COURSES**

A minimum of 30 hours of graduate coursework is required to obtain the Master of Engineering degree. At least fifteen (15) hours must be completed in a selection of ELCT courses at the 700 level or above and may include up to six (6) credits of ELCT 897 – Directed Individual Study. Up to six (6) credits at the 500 level or above can be taken from any other field deemed appropriate by the student's advisor. The remaining hours must be taken from ELCT courses at the 500 level or above.

**Table 2: M.E. Requirements.**

ELCT 5XX	Any Course Approved by Advisor at 5xx level or higher	ELCT 897 (Directed Individual Study)	ELCT 7XX (excluding ELCT 799, 797, 899)
(15 or 9) hours	(0 or 6) hours	(6 or 0 hours)	(9 or 15) hours

**Transfer Credit.** No more than 12 hours of graduate credit may be transferred from other institutions for credit towards a degree. Grades of B or better are required on all transfer credits. Transfer credits must be approved by the Graduate Director and by the Dean of the Graduate School. Approval for transfer does not guarantee acceptance of the courses in the student's degree program. The degree program must be approved separately by the student's advisor. Credits transferred from other institutions are subject to the six-year limit on age, and no mechanism exists for revalidating over-age transfer credits.

**Program of Study.** Students are required to define a program of study during their first semester in the Master of Engineering program. The program of study fully defines which courses will be applicable towards the degree. The program may be changed during the course of study whenever conditions warrant, but the students shall not deviate from the program of study currently on file. Alterations to the program of study must be approved by the student's advisor, the Graduate Director, and by the Dean of the Graduate School. The program of study serves to protect the student in case of change of faculty and facilitates planning on the part of the student and the department.

**Revalidation of Courses.** All courses applicable to the degree must be completed within a period commencing six years prior to the date of graduation. It may be possible to revalidate over-age courses in some instances. All petitions for revalidation should be directed to the graduate committee via the Graduate Director.

### Comprehensive Assessment

Each candidate for the Master of Engineering degree must complete a comprehensive assessment. The format of the assessment will be determined by the two (2) assessment committee members chosen for the student.

- The Graduate Director, by reviewing each eligible student's Program of Study, will choose two (2) faculty members to comprise the Comprehensive Exam committee of the student. *The committee should be formed immediately after the student submits his/her form for graduation at the beginning of the semester.*
- The committee will administer the comprehensive assessment as soon as possible after its formation.

- Questions will be based on courses included in the student's program of study. The questions will be oriented to assess the student's ability to apply knowledge gained in coursework in an integrative fashion toward the solution of engineering problems.
- Students will have a minimum of two (2) weeks to prepare for an oral assessment or a written response as decided by their committee.
- The committee members will evaluate the answers and give results back within 2 weeks after the student has submitted his/her response.
- The committee will fill out an evaluation form which will contain the scores for the assessment and will indicate whether the student has passed or need to retake the assessment. *Students can only take the comprehensive assessment twice.*
- A photocopy of all written responses will be stored in the department as a part of the academic records.
- *As per current Graduate School regulations, students must pass the comprehensive assessment 60 days prior to their graduation.*

M.S. students are normally not permitted to take ELCT 797 (Research).

#### 4.5. ACCELERATED BACHELOR'S/MASTER'S PROGRAM

The Bachelor's/Master's Degrees Accelerated Program in Electrical Engineering allows undergraduate students to complete both the B.S. degree and M.S. or M.E. degrees in as few as five years.

To be eligible to apply for the EE's accelerated program, a student must have a minimum GPA of 3.40 and have completed at least 90 credit hours toward their baccalaureate degree. In addition, the student must have a sufficient foundation in Electrical Engineering course work to enable them to take graduate-level courses.

Students applying to this program must submit to The Graduate School a completed "**Accelerated Bachelor's/Graduate Study Plan Authorization**" (G-ABGSP) with endorsements of the undergraduate advisor and the program graduate director. The dean of The Graduate School has final authority for approving accelerated education plans. This form must be submitted for each semester in which one or more of these courses are taken in order for the Registrar's Office to properly enroll the student.

Participation in the accelerated program does not require or assure acceptance into the Graduate School. Students wishing to continue towards a master's degree in Electrical Engineering at UofSC must apply formally to the Graduate School by submitting the appropriate application and all required supporting documents. Students in the accelerated program will be eligible for graduate assistantships upon admission to The Graduate School if they apply for a Master of Science degree.

Only graduate-level courses (numbered 500 and above) satisfying both B.S. and master's degree requirements may be used for dual credit. No more than twelve (12) credit hours may be applied towards both the bachelor's and master's degree.

**Eligibility:**

- **GPA 3.4**
- **Senior Standing (90hrs.)**

**Application Procedure:**

- **Fill out an Accelerated Bachelor's/Graduate Study Plan Authorization form and obtain all required signatures and submit it to the Graduate School.**
- *This form has to be approved by the Dean of the Graduate School and must be on file with the Registrar's office before classes for the relevant term begin.*

**Additional Information**

- **Courses 500-level and above (indicated with "Accelerated Plan") on transcript may be used by student toward their graduate degree program**
- **GPA credit for courses is calculated in student's *undergraduate* GPA**
- **Up to 12 credit hours can be considered to satisfy both B.S and M.S**

## 4.4 DOCTOR OF PHILOSOPHY DEGREE PROGRAM

### 4.4.1 Admission Requirements

Students are generally accepted into the Ph.D. program only with a regular admission. Conditional admission is granted only in the rarest of cases.

Ph.D. Students are strongly encouraged to distinguish their area of specialization while applying to the Graduate Program. As an internal policy, we accept Ph.D. students only if a faculty member has agreed to supervise the candidate.

#### Regular Admission

Admission to the Doctor of Philosophy degree program is competitive. Students meeting the following minimum requirements are eligible for a regular admission but meeting these requirements should not be construed as a guarantee of acceptance. It is not necessary for a student to have completed an M.S. degree prior to enrolling in the Ph.D. program, but only exceptionally well-qualified students are urged to apply directly to the Ph.D. program immediately after completing the B.S. degree.

- A B.S. or M.S. degree in Electrical Engineering with an average of B (3.0) or better on all work completed.
- Satisfactory GRE scores (at least 153 verbal, 155 quantitative, 3.0 analytical writing) are required for the student whose undergraduate degree is not from an ABET-accredited program. In rare circumstances, the GRE can be waived by approval of the Department Chair for the students who are highly recommended and have demonstrated strong research and academic backgrounds.

- At least two (2) strong letters of recommendation.
- For students whose native language is not English, a TOEFL score equal to or greater than 80, IELTS international Academic Course Type 2 minimum score 6.5 or higher, or PTE Academic score of 53 or higher. Students are exempt from taking the TOEFL exam if they received their undergraduate degree from a university in an English-speaking country.
- Please refer to the International Applicants page on the Graduate School website: [https://www.sc.edu/study/colleges\\_schools/graduate\\_school/apply/international\\_applicants/index.php](https://www.sc.edu/study/colleges_schools/graduate_school/apply/international_applicants/index.php)

### Conditional Admission

Certain applicants may show promise for success in the Ph.D. program, despite not meeting all of the requirements for regular admission. These students may be admitted conditionally.

#### 4.4.2 Supervision

##### Advisor and Dissertation Committee

A Ph.D. student must have a faculty advisor when admission decisions are made.

Each doctoral students' dissertation work is guided by a committee of the faculty. It is compulsory to identify an area of specialization and a faculty advisor to be admitted in the PhD program. The advisor will assist the student with nominations for the remainder of his or her committee. The committee shall consist of no fewer than four persons, at least one of whom shall represent a cognate field. A majority of the committee shall be from the EE Department. Next, the student will fill out a *Doctoral Committee Appointment Request for Appointment of Ph.D. Comprehensive Assessment and Dissertation Committee*, which will be forwarded to the Dean of the Graduate School.

The doctoral student's advisor is responsible for approving the student's program of study and for supervising his/her research efforts. In addition, the committee evaluates the dissertation proposal and administers the comprehensive assessment.

##### Co-Advisors

Ph.D. students should be aware that their dissertation work may be advised by more than one advisor. In the case of more than one advisor, each advisor will be referred to as Co-Advisor.

#### 4.4.3 Degree Requirements

The Doctor of Philosophy degree program comprises a dissertation and nominally 60 hours of coursework beyond the B.S. degree. The program of study, which defines each student's particular degree plan, must be approved by his/her advisor, the Graduate Director, and the Dean of the Graduate School. Specific degree requirements are set forth below.

## COURSES

At least 60 credit hours of graduate work are required in the Doctor of Philosophy degree program. Up to twelve (12) hours of ELCT 899 - Dissertation Preparation are counted towards the 60-credit hour requirement. Graduation requires a graduate GPA of at least 3.0. Furthermore, accumulation of 12 or more credit hours with grades below B will result in expulsion.

Students entering the Ph.D. program with a B.S. degree are required to complete a minimum of 48 hours of course work and 12 hours of dissertation preparation. At least 24 hours of coursework must be in the major and the level of 700 or above. Of these 24 hours 12 hours can be fulfilled by enrolling and completing ELCT 797 (Research) and 6 hours can be fulfilled by enrolling and completing ELCT 897 (Individual Directed Studies).

Students entering into the Ph.D. program with an approved M.S. or M.E. degree are required to complete 18 hours of course work and 12 hours of dissertation preparation. At least nine hours of coursework must be at the level of 700 or above. Students entering the Ph.D. program with an M.S. or M.E. may not enroll and receive credits from ELCT 797 (research) unless they have obtained their degrees from UofSC.

The Program of Study (POS) must be defined in consultation with the student's advisor and approved by the graduate director. Changes in the POS require permission of the student's advisor and approval of the Graduate Director. Any such changes must be approved before the beginning of a student's final semester.

Not more than 12 hours of **ELCT 797** (students entering the Ph.D. program with an M.S. or M.E. Degrees not from UofSC are not eligible to take ELCT 797) and not more than six hours of **ELCT 897** may be approved.

**Courses.** Courses are usually recommended by the student's academic advisor or committee according to the area of specialization selected by the student. Areas of specialization include: Power and Energy Systems, Communications and Electromagnetics, Electronic Materials and Devices, and Decision and Control.

**Elective Courses.** Courses can be taken from ELCT and other fields as deemed appropriate by the student's advisory committee.

### Foreign Language.

- For students whose native language is not English, a TOEFL score equal to or greater than 80, IELTS international Academic Course Type 2 minimum score 6.5 or higher, or PTE Academic score of 53 or higher. Students are exempt from taking the TOEFL exam if they received their undergraduate degree from a university in an English-speaking country.
- Please refer to the International Applicants page on the Graduate School website:
- [https://www.sc.edu/study/colleges\\_schools/graduate\\_school/apply/international\\_applicants/index.php](https://www.sc.edu/study/colleges_schools/graduate_school/apply/international_applicants/index.php)

**Transfer Credit.** No more than 12 hours of graduate credit may be transferred from other institutions for credit towards the degree of Doctor of Philosophy. Grades of B or better are required on all transfer credits. Transfer credits must be approved by the graduate director and by the graduate dean. Approval for transfer does not guarantee acceptance of the courses in the student's degree program. The degree program must be approved separately by the student's advisory committee. Credits transferred from other institutions are subject to the eight-year limit on age, and no mechanism exists for revalidating over-age transfer credits. Students receiving 30 hours of credit from an accredited MS or ME program toward the required 60 hours are not eligible for additional transfer credits.

**Program of Study.** Each student is required to submit a *Doctoral Program of Study* form, listing the coursework which will be applied to the degree. The program may be changed during the course of study whenever conditions warrant, but the student shall not deviate from the program of study currently on file. Courses not formally approved by the committee by inclusion on this form may not be acceptable toward the student's degree. Alterations to the program of study must be approved by the student's advisor, the Graduate Director, and the Dean of the Graduate School. The program of study represents a plan of action, which when successfully implemented, will bring the student to his/her desired degree objective. This program of study serves to protect the student in case of change of faculty and facilitates planning on the part of the student and the department. The candidate must satisfactorily complete all courses and studies required for the degree.

The *Program of Study* form should be submitted within 1.5 years of their enrollment in the program. Approval of alterations to the original plan of study should be requested on the form, *Request for Adjustment in Graduate Program*.

**Revalidation of Courses.** All courses applicable to the degree, exclusive of any master's degree work, must be completed within a period commencing ten (10) years prior to the date of graduation. Not more than the first year of post-baccalaureate work may be revalidated by satisfactory performance on the admission to candidacy examination.

### **Residency**

The doctoral residency requirement may be satisfied only after the admission to a doctoral degree program and must be fulfilled by enrollment in at least 18 graduate credit hours (**does include 797, 897, and 899** but not audited courses) within a span of three consecutive semesters (excluding summers). Enrollment in a summer term is not required to maintain continuity, but credits earned during summer terms will count towards residency.

### **Admission to Candidacy**

Admission to Ph.D. candidacy has two requirements. First, the student must pass a qualifying examination and have the appropriate Graduate School Qualifying Exam Verification form on file. The student must complete and submit a Graduate School Program of Study form to be approved by the Dean of the Graduate School. Doctoral students must have been admitted to doctoral candidacy for at least one (1) full academic year prior to graduation, or the graduation application will be rejected.

### Qualifying Examination

All Ph.D. students must pass a qualifying exam, usually conducted by the Graduate committee (or other EE Faculty members in support of the Graduate Committee), within one and a half (1.5) years of entering the Ph.D. program. This exam tests the prospective Ph.D. candidate's knowledge of the fundamental aspects of electrical engineering. If a Ph.D. student is unable to pass the Ph.D. qualifying examination after two attempts, he/she must withdraw from the Ph.D. program. In such a case, the student may request to change their POS from Ph.D. to M.S. or M.E. Students who have transferred from other institutions e.g., students who may have arrived at UofSC with their advisors when a new faculty member is hired and may have passed their Ph.D. qualifying examinations at their former institutions may request a waiver upon presentation of documentation of passing.

### General Exam Guidelines:

- The Ph.D. qualifying examination will be written, and of 3 hour duration. The questions will be developed and graded by members of the EE faculty.
- Students will choose three out of the following four topic areas prior to the exam:
  - (1) *Circuit & Electronics*
  - (2) *Signals & Systems and Controls*
  - (3) *Semiconductor Devices*
  - (4) *Electromagnetics.*
- Each student will be asked two questions from each topic.
- The questions will be randomly chosen out of a pool of questions.
- All questions will be within the breadth of Electrical Engineering knowledge and concepts taught in an undergraduate program. During the exam more in-depth (or specialized) concepts can be asked in the major area of research of the students.
- The exam will be given at the end of every major semester (Fall and Spring).

### Dissertation Proposal

This proposal must be presented in both written and oral fashions to the student's committee, and is expected to be more comprehensive than the proposal for an M.S. thesis. Each proposal should include a cover page attached to the proposal, and a copy of the approved proposal will be kept in the student's file along with a signature page.

### Comprehensive Assessment

The degree candidate must pass a comprehensive assessment in the fields of study relevant to his/her dissertation topic, the assessment having both written and oral portions. The committee for the assessment shall consist of all the members of the student's committee approved by the Graduate School. The examination is to be administered after the candidate has completed all of the courses required in his program except for those in which he/she may be currently enrolled. The assessment must be taken **not less than 60 days** prior to the date at which the student expects to receive his/her degree. Any significant alteration to the dissertation subject necessarily requires that the student repeat the comprehensive assessment.

A student pursuing the doctoral degree is expected to have a working knowledge of one area in great depth, and of other related areas in somewhat lesser depth. The student should be thoroughly familiar with the literature in his/her chosen field. The comprehensive assessment will determine whether the student is intimately familiar with the state of current understanding within his/her primary field of study and with other areas which may be relevant to his/her studies.

**Written.** The written portion of the assessment typically requires the student to demonstrate a high degree of technical proficiency in his field of expertise. This degree of technical proficiency can be demonstrated answering a set of questions prepared by the committee or by preparing a Research Proposal in response to a real call selected by the advisory committee. The timing of the assessment is defined by the advisory committee.

**Oral.** The oral portion of the assessment is judged on two points – technical ability and personal presence. The doctoral candidate must possess not only highly refined technical skills, but also a capability for presenting his knowledge to others in a clear and concise manner. The committee determines the duration of the oral portion.

**Administration, evaluation, and reporting.** A member of the committee, appointed by the Graduate Director or Department Chair, is responsible for chairing the assessment and reporting the outcome of the assessment to the student, the Graduate Director and the Dean of the Graduate School. The outcome of the assessment will be decided by majority vote of the committee from among the following three possibilities: pass, fail, deferred. In the event of a deferred decision, the specific deficiencies should be recorded in the formal report of the assessment, along with the requirements for making up those deficiencies. After the deficiencies have been made up, the assessment committee must convene again to complete the assessment procedure. At this time, the only possible outcomes are either pass or fail.

### Dissertation

The most important component of the Ph.D. program is the dissertation, an original work that advances the frontiers of knowledge in some particular field and demonstrates the candidate's capacity for independent study. A vital component of the dissertation is the *Disclosure of Claims*, in which the candidate's contributions are clearly and concisely set forth. The bulk of the dissertation should summarize the state of the art prior to the candidate's contributions, should detail the advances made by the degree candidate, and should indicate the future prospects for additional advances. The dissertation must stand the scrutiny of those familiar with the field and be judged to represent a significant contribution. Such judgment is indicated by selection of the dissertation research for publication in a major journal.

**Enrollment in Dissertation Preparation.** “During the preparation of the dissertation, any student who wishes to use university facilities or to confer with the faculty on dissertation work must be officially enrolled for dissertation credit. Registration for a minimum of 12 credits in dissertation preparation is required of all doctoral candidates.” [Grad. Bulletin] A student’s enrollment in ELCT 899 should reflect the level of involvement of both the student and the dissertation advisor.

**Completion of the Dissertation.** The student should plan to complete the dissertation early in the semester during which graduation is expected. Only in truly exceptional circumstances will completion *in absentia* be approved. The format of the dissertation must be acceptable to the graduate school. A sample title page is shown in the Appendix. The Graduate School requires all dissertations to be submitted electronically. Detailed information regarding electronic submission is available on their website: <http://gradschool.sc.edu/students/thesisdiss.asp?page=acad&sub=etd>.

**Dissertation Defense.** The dissertation must be approved by every member of the student’s advisory committee before the public defense can be scheduled.

The defense should be scheduled not less than two weeks after the candidate presents the dissertation document to his or her committee. A notice bearing an abstract of the dissertation and the time and location of the defense must be posted on the graduate bulletin board in the Swearingen Engineering Building at least one week prior to the date of the defense.

The chair is responsible for attending to all details associated with the defense, including chairing the public defense and filing a written report of the outcome. The report shall state whether or not the dissertation was judged acceptable, and if not acceptable, the nature of any changes that might be required to make the dissertation acceptable. This report must be filed with the Graduate Director within two days of the defense. If any changes to the dissertation are required, the chair is responsible for ensuring that they are duly made. When all requirements have been satisfied, the examination chair will so notify the Graduate Director, and the Dean of the Graduate School by means of the *Dissertation Signature and Approval Form*. Following such notification, the student must submit their dissertation electronically to the ETD Administrator site.

#### 4.5 NON-DEGREE PROGRAM

Some individuals may be allowed to enroll in graduate courses offered by the Department while not seeking a graduate degree from this institution. Students from other universities, visiting scholars, and practicing engineers wishing to enhance their knowledge in specific areas fall into this category.

Two forms of non-degree enrollment are possible. The first, *non-degree admission*, allows the student to earn credit for the course, perhaps for transfer to another school, but not to work towards a degree. The second, *audit admission*, does not allow course credit of any type. Students admitted for *non-degree* study are strictly limited to no more than 12 hours of graduate coursework. Individuals admitted to *audit* courses are not entitled to have homework or tests graded, they can register in courses with the consent of the instructor, and their registration priority is subordinate to students seeking course credit.

Non-degree students are now the purview of the Graduate School. Individuals wishing to enroll in graduate courses of the department without seeking a degree are subject to the same general

requirements as those seeking degrees. A paramount consideration is the academic background of the student. Any student, whether seeking degree credit or not, must be adequately prepared to comprehend the material presented in the graduate classes. Therefore, students seeking non-degree admission must furnish evidence of technical competency, generally by providing transcripts of their undergraduate studies.

## 5. ACADEMIC REGULATIONS

The academic regulations of the department are generally in conformity with those of the Graduate School. The student is referred to the Graduate Bulletin and the Code of Student Academic Responsibility. <http://bulletin.sc.edu/index.php>

### 5.1 ACADEMIC INTEGRITY

Graduate students are expected to adhere to the highest standards of integrity in all their endeavors. Such high standards are fundamental to the notion of self-enrichment through intellectual exploration and form the basis for success in one's professional career. The academic community places great trust in the student; violation of that trust is considered a very serious offense indeed. The student is cautioned against committing any infraction including, but not limited to, cheating, plagiarism, falsification of data, misrepresentation of fact, or bribery. The student should refer to the University's *Code of Student Academic Responsibility*.

Any proven act of misconduct is subject to penalties ranging from assignment of a reduced or failing grade to expulsion from the graduate program. No student will be supported by the department after being found guilty of any infraction of the standards of academic integrity.

### 5.2 ADVISEMENT

Graduate students are expected to consult with an appropriate member of the faculty prior to enrolling in courses. The student's principle academic advisor will be his/her thesis or dissertation advisor. Students in the non-thesis Master of Engineering program will have an academic advisor only. Each student is responsible for arranging the advising relationship with some member of the faculty. Upon request, the graduate director will suggest one or more potential advisors appropriate to the student's interests. Prior to obtaining an advisor, students should consult with the Graduate Director before enrolling in courses.

Note particularly that the student, not his/her advisor, is responsible for ensuring that all deadlines and requirements associated with the degree program are met. The requirements are clearly published in this Graduate Handbook of the Department. The student is cautioned to read and understand the degree requirements presented in both publications.

### 5.3 WAIVER OF A DEGREE REQUIREMENT

A waiver of a specific departmental degree requirement may be issued by the graduate committee under certain circumstances. Students seeking such a waiver should file their petition for waiver with the Graduate Director. The petition should state the exact nature of the circumstances that give rise to the necessity for the waiver, and should justify the student's actions with respect to the circumstances. No waiver of general Graduate School policies or requirements can be granted.

### 5.4 APPEALS

Appeals by graduate students shall be governed by the policy stated in the Graduate Bulletin. The "internal process" referred to in that policy shall be deemed to be an appeal in writing submitted through the graduate director to the graduate committee. Decisions of the graduate committee are final within the Department.

## 5.5 SATISFACTORY PROGRESS

All students must demonstrate satisfactory progress towards their degree objective. Satisfactory progress can still be maintained if a student takes one semester off. The graduate school does however require updating or reapplying for any student gone for one semester. Students not making satisfactory progress will be suspended from the program and must apply for readmission. Enrollment in the summer terms, though not mandatory, is highly recommended.

For a full-time M.S., M.E., or Ph.D. student, the satisfactory progress standards are precisely defined as follows:

### 5.5.1 Satisfactory Progress for M.S. Students

- M.S. students are required to define a program of study during their first year in the M.S. program. The program of study fully defines which courses will be applicable towards the degree.
- M.S. students are expected to complete their coursework within the first three semesters.
- M.S. students are expected to complete their degree work within five semesters. By the end of study, they are expected to have published at least one conference paper.

### 5.5.2 Satisfactory Progress for M.E. Students

- M.E. students are required to define a program of study during their first year in the M.E. program. The program of study fully defines which courses will be applicable toward the degree.
- M.E. students are expected to complete their degree work within four semesters.

### 5.5.3 Satisfactory Progress for Ph.D. Students

- Ph.D. students are required to pass the Qualifying Examination by the end of the third semester.
- Ph.D. students are required to define a program of study during their first year in the program. The program of study fully defines which courses will be applicable toward the degree.
- Ph.D. students will be admitted to doctoral candidacy by satisfying two requirements: passing the Qualifying exam, and submitting an approved Program of Study.
- Ph.D. students are required to take the Comprehensive Assessment within the first three years.
- Ph.D. students are expected to complete their coursework within the first three years, and their degree work within three to five years.
- By graduation, they are expected to submit and/or publish at least two refereed journal papers.

## 6. FINANCIAL AID

Financial aid for graduate students may be available from a number of sources. Aid can be in the form of scholarships, fellowships, teaching assistantships, and research assistantships. In the last ten years the total number of Ph.D. students in the department has been in the range of 50 to 90. Majority (more than 90%) of electrical engineering Ph.D. students are supported through research assistantships. The EE department provides only a few teaching assistantships. Some cases Ph.D. students may be funded by scholarships, fellowships, be self-funded or funded by their employer. While the number of M.S. students in the department has been and still continue to be small financial aid for them is also in the form of research/teaching assistantship, scholarship, fellowship, self-funding etc. The Department provides input into the awarding a very small number of fellowships and scholarships administered by the Graduate School. Most fellowships are awarded by the Graduate School, but some are awarded by individual agencies.

M.E. students normally are not eligible for research or teaching assistantships. By and large M.E. students are self-funded or are funded by their employers.

### 6.1 FELLOWSHIPS

Fellowships and scholarships are generally awarded on the basis of criteria established by the agency sponsoring the fellowship. In general, no duties are required of fellowship or scholarship recipients. These awards exist for the purpose of inducing individuals fitting certain criteria to extend their education through graduate programs. Various industries and governmental agencies award fellowships. The Graduate School keeps a listing of available fellowships, applications, and application deadline dates. In recent years department of electrical engineering graduate students have received fellowships like the National Science Foundation Graduate Research Fellowship (<https://www.nsfgrfp.org/> ) and the National Defense Science and Engineering Graduate (NDSEG) Fellowship (<https://ndseg.org/> )etc. International students from overseas countries such as Egypt, Turkey, Saudi Arabia have availed scholarships provided by their respective governments or other agencies to pursue their graduate studies. Limited number of students have come to pursue their graduate studies by availing the Fulbright Fellowship.

### 6.2 RESEARCH AND TEACHING ASSISTANTSHIPS

Research and teaching assistantships are awarded by the Electrical Engineering Department.

***M. E. students do not normally receive financial support.***

#### 6.2.1 Types of Assistantships

##### Research Assistants

The majority (more than 90%) of assistantships awarded in the Department are research assistantships (RAs) and in some rare cases a few teaching assistantships (TAs). Recipients of research assistantships generally work on specific research projects at the discretion of the faculty member providing the assistantship. The research project to which the student is assigned will often be the subject of the student's thesis or dissertation. RAs must enroll in specific number of credit hours each semester. RAs receive a monthly stipend and tuition supplement to pay for their tuition.

## Teaching Assistants

Very limited number of teaching assistantships (TAs) are awarded to those graduate students who can fulfill certain teaching-related needs of the Department and have a good understanding of the subjects. Normally all students wishing to be hired as TAs must attend mandatory TA orientation and training that occurs every semester on specific dates. International graduate students are also tested on their English proficiency in terms of both speaking and writing. A student wishing to do a Ph.D. or M.S. should generally be funded by RA funds. Only for limited cases and for shorter durations students may work as TAs or TA plus RA when grant/contract funds may not be available to support their education.

Quarter-time TAs typically spend 10 hours per week on their duties. Please note quarter-time TA stipend is likely too small an amount for a student to support himself or herself. They would need to have other funding such as RA, fellowship, or scholarship in addition to the TA funding support.

Half-time TAs (normally assisting with undergraduate labs) spend 20 hours/week. These TAs receive a monthly stipend and tuition supplement comparable to the RAs.

One-eighth time TAs typically spend only about 5 hours/week helping with grading. Normally these individuals already work as RAs and thus their support consists of 75% RA and 25% TA or grader.

Assistantship duties are decided before the beginning of each semester; and typically, appointment paperwork for assistantships must be filled out one month or two before classes start. Recipients of teaching assistantships are expected to report to the Department one week prior to the beginning of classes to obtain and prepare for their assignments. Assignments may include grading homework and quizzes, assisting with laboratory instruction, or teaching a course, depending on the student's qualifications. Also, before classes start, teaching assistants must complete the teaching assistant (TA) training course as offered by the Graduate School (four days for international students and two days for U.S. citizens).

### 6.2.2 Policies

#### Award

Research assistantships (RAs) generally are awarded directly by members of the faculty who participate in funded research. Normally these would include grants and or contracts received awarded to faculty members by federal agencies, non-profits, and corporations/private companies. Depending on project duration, source, and nature of projects students may be able to receive RA support from one or multiple sources. RA support includes a monthly stipend, tuition payment and potentially health insurance benefit payment. The exact stipend amount, tuition supplement and insurance benefit vary from project to project. Students will normally receive an offer letter during the time of their admission which will delineate those amounts. In general, the EE department stipend ranges from \$1800 to \$2500 per month along with full tuition payment.

The amount of any research assistantship is determined by the faculty member making the RA offer.

Teaching assistantships are awarded by the Department Chair after receiving application or interest statement from the student and his/her advisor. Teaching assistantships are not normally available during the summer months. Assistantship amounts range from \$1,000/semester for 1/8th time appointments to \$9000/semester for 1/2 time appointments, depending on a student's status and qualifications.

Students may be awarded both a research and a teaching assistantship; however the total of such awards cannot exceed a one-half time commitment.

### **Tuition Reduction**

Students receiving research assistantships and half-time teaching assistantships are eligible for a reduced tuition rate. Receipt of an assistantship in the previous spring semester or subsequent fall semester entitles the student to reduced tuition in the summer term as well.

### **Satisfactory Progress**

Students receiving departmentally awarded assistantships are expected to pursue their degree objective with all due vigor. This specifically excludes holding other employment. Recipients of assistantships will be reviewed each year to determine whether they have made satisfactory progress in the preceding year. Renewal of the assistantship is contingent upon both an exhibition of satisfactory progress and continuing availability of funds. Master's degree candidates will be supported for no more than two years, and Ph.D. students for no more than five years (three years beyond the M.S.).

Graduate assistants must be enrolled as full-time students, taking no less than 6 hours per semester in the Fall or Spring semesters. All research and teaching assistants are expected to maintain satisfactory grade averages. Receipt of grades below B on six hours of courses will be construed as an indication of unsatisfactory progress and the assistantship will be terminated.

All continuing students receiving departmentally awarded assistantships must pre-register for the classes they will take in the next semester. Failure to pre-register may result in termination of the assistantship.

### **Payroll, Tax and Other Information**

Assistantships are paid on a twice-monthly basis, at the middle and end of the month. Federal regulations require that all employees complete an I-9 form before being placed on the payroll. This form can be obtained from the accountant in the Engineering Dean's office. A W-4 form also must be completed to establish the level of federal and state tax withholding. The federal IRS now considers income from assistantships to be taxable, but the tuition remission is not taxable.

## 7. MISCELLANEOUS DEPARTMENTAL POLICIES

### 7.1 FACILITY ACCESS

Various specialized departmental resources are available to graduate students depending upon their needs. Some of the resources are available to all graduate students on a first-come, first-served basis; others are available only to selected individuals, based on their needs.

All full-time graduate students are eligible for a building entry key. *Persons holding building access keys must assume a proper degree of responsibility for the privilege.* Generally, this means that a graduate student should not admit any other person to the facility, nor should they lend their key to any other person. Any time a person leaves the building after normal hours, the exit door should be locked. Rules for access to other areas of the building are clarified below.

### 7.2 RESEARCH LABORATORIES

Access to any individual departmental research laboratory generally is controlled by the faculty member(s) conducting research within the laboratory. Keys will be issued only with the laboratory director's written authorization. Each student possessing keys to any laboratory must adhere to the laboratory director's expectations with regard to security.

#### *Computer Resources*

Access to computer facilities is available in a number of locations. Some computers are departmentally controlled resources and hence available to all students on a first-come, first-served basis; others are devoted to specific research programs and access is controlled by individual laboratory directors. Students must not use university computers and software for personal entertainment or gaming. Limited personal use is permitted as governed by the university's IT policy. Students must not allow other unauthorized individuals to use or access their university provided computers.

### 7.3 TV MONITOR WITH ANNOUNCEMENTS

Periodically the department's TV monitor in front of Swearingen 3A80 will post news and announcements. Students are encouraged to monitor those. Announcements are also sent frequently out via email to all students.

### 7.4 PURCHASING, TRAVEL AUTHORIZATION, REIMBURSEMENTS

Faculty members often assign university credit cards to their graduate students to allow them to purchase laboratory materials and supplies. Students may also be involved in purchasing

equipment. All such card holders and purchasers must receive the necessary training and provide all receipts and statements on time to the department's finance manager.

Graduate students wishing to attend conferences may receive partial financial support from the graduate school by submitting applications. For details see:

[https://sc.edu/study/colleges\\_schools/graduate\\_school/opportunities\\_support/travel\\_grants/index.php](https://sc.edu/study/colleges_schools/graduate_school/opportunities_support/travel_grants/index.php)

The remaining support may be made available from project funds by the student's advisor. Prior to traveling each student traveler must submit a travel authorization request. Upon return students must submit a reimbursement request.

### **7.5 OFFICE DESK SPACES, COPYING/PRINTING**

Normally all graduate students are assigned desks in the laboratories managed by their advisors or their collaborators. Computing resources and lab supplies are also provided by their advisors.

The copier in the EE front office may be used to copy documents. It is expected students will use their own lab printers to print their documents.

### **7.6 SEMINAR ATTENDANCE**

Seminars are sponsored by the Department on a frequent basis. All graduate students are encouraged to attend these seminars. Attendance by teaching and research assistants is required at selected seminars. Notice of upcoming seminars and of required seminars will be provided on the graduate bulletin board. Failure to attend required seminars may result in an evaluation indicating unsatisfactory progress, and hence revocation of the assistantship.

### **7.7 CONFERENCE PRESENTATIONS**

Students are encouraged (and often required) to submit the results of their research efforts to technical journals and conferences. Before a student will be allowed to make a public presentation at a conference, the student's talk first must be approved by concerned members of the faculty. This requirement can be met by satisfactory completion of the thesis or dissertation seminar, or by presentation in a special seminar called by advance notice on the graduate bulletin board.

### **7.8 LABORATORY AND OTHER FACILITY ACCESS**

All electrical engineering research laboratories and/or facilities are maintained and operated either by an individual faculty or a group of faculty members. The department or the chair does not operate or maintain any research lab or facility for use by faculty or their students. Facilities that operate on a fee for service include those like the machine shop and the high resolution X-ray imaging facility which are maintained and operated by the mechanical engineering department. All undergraduate and/or graduate teaching laboratories and their associated materials and supplies are expected to be used for teaching and instruction only. Students wishing to use laboratories and facilities maintained and operated by other faculty members than their advisors should talk to their advisors to communicate their needs.

## 7.9 LABORATORY SAFETY AND HOUSEKEEPING

EE research labs are maintained and operated by individual faculty or teams of faculty and are located in three buildings: (i) Swearingen Building at 301 Main Street, (ii) 300 Main street, and (iii) the McNair Aerospace building across from Assembly street.

The Department is proud of the excellent research and teaching facilities available and urgently solicits your cooperation in their proper use and maintenance. As appropriate, students may be required to attend sessions on biohazards and/or handling of hazardous waste. These require annual re-education/certification. And we ask that you always observe the following general guidelines:

(a) Safety glasses are absolutely necessary whenever and wherever experimental work is conducted involving chemicals. Safety glasses are available in the Technician Shop, in the University Bookstore, and from your research advisor.

(b) Before leaving any experiment to operate unattended overnight, you must first make sure that it does not constitute a possible fire or flood hazard. You must clearly post visible information on the door listing a phone number to be contacted for emergencies. Specifically, if flammable solvents are involved, they should be left in a closed hood. If this is not possible, check all joints to see that they are well lubricated and vapor tight. If running water is involved, please make sure that all tubing is in good condition, that all connections are tight (preferably wired) and that all connecting troughs and/or sinks are free of any debris (corks, Kimwipes, etc.) which could clog the drain. Be sure to check with your advisor for approval first.

(c) All refrigerators in laboratories must be clearly marked “for chemicals only.” No food may be stored in laboratory refrigerators.

(d) No one will be allowed to handle or work with radioactive isotopes or around potentially dangerous sources of radiation, e.g., X-ray, microwave, laser, until s/he has been thoroughly instructed by the faculty member in charge on the proper safety precautions and procedures to be followed.

(e) No one is allowed to work alone with electrical equipment with exposed terminals at a potential greater than 40 volts. When working with equipment or conducting experiments with potentially lethal voltages an additional person trained in administering CPR must be present and all additional lab safety procedures should be followed as instructed by the faculty member in charge.

(f) The faculty member in charge of a laboratory, the Department Chairman, and the Department Safety Committee should be informed immediately of any safety hazards or accidents. Any complaints regarding potential safety hazards and any safety suggestions will be treated seriously and greatly appreciated.

\*To summon emergency help, call the University Police at 7-9111. For emergency medical treatment, proceed to Thompson Student Health Center (behind Russell House, 7-3175). If they are closed, proceed to the nearest hospital (Palmetto Baptist Medical Center) for care. Be sure to contact the Department Chairman and Safety Officer concerning the accident.

All electrical engineering research laboratories and/or facilities are maintained and operated either by an individual faculty or a group of faculty members. The department or the chair does not operate or maintain any research lab or facility for use by faculty or their students. Facilities that operate on a fee for service include those like the machine shop and the high resolution X-ray imaging facility which are maintained and operated by the mechanical engineering department. All undergraduate and/or graduate teaching laboratories and their associated materials and supplies are expected to be used for teaching and instruction only. Students wishing to use laboratories and facilities maintained and operated by other faculty members than their advisors should talk to their advisors to communicate their needs.

### **7.10 GRIEVANCES, APPEALS, AND PETITIONS**

Please refer to the CEC grievance Policy:

[https://www.sc.edu/study/colleges\\_schools/engineering\\_and\\_computing/internal/documents/graduate\\_resources/cec\\_grad\\_grievances\\_appeals\\_petitions.pdf](https://www.sc.edu/study/colleges_schools/engineering_and_computing/internal/documents/graduate_resources/cec_grad_grievances_appeals_petitions.pdf)

## LIST OF FORMS FOR EACH DEGREE PROGRAM

<b>Degree Program</b>	<b>Forms</b>	<b>Time Frame</b>
<b>Master of Engineering (ME)</b>	<ul style="list-style-type: none"> <li>• Program of Study (MPOS)</li> <li>• ME Comprehensive Assessment Verification form</li> </ul>	<ul style="list-style-type: none"> <li>• Within the 1<sup>st</sup> year of enrollment</li> <li>• Within 2 years of enrollment</li> </ul>
<b>Master of Science (MS)</b>	<ul style="list-style-type: none"> <li>• Program of Study (MPOS)</li> <li>• Thesis Committee and Topic Approval</li> <li>• MS Comprehensive Assessment Verification form</li> <li>• Thesis Signature and Approval form (G-TSF)</li> </ul>	<ul style="list-style-type: none"> <li>• Within the 1<sup>st</sup> year of enrollment</li> <li>• Beginning of the semester in which you plan to graduate</li> <li>• Beginning of the semester in which you plan to graduate</li> <li>• Within 2.5 years of enrollment</li> </ul>
<b>Doctor of Philosophy</b>	<ul style="list-style-type: none"> <li>• Qualifying Exam</li> <li>• Program of Study (DPOS)</li> <li>• Doctoral Committee Appointment Request (G-DCA)</li> <li>• PhD Comprehensive Assessment</li> <li>• Proposal Presentation</li> <li>• Dissertation Defense Announcement (online at the Graduate School website)</li> <li>• Dissertation Signature and Approval form (G-DSF)</li> </ul>	<ul style="list-style-type: none"> <li>• Within 1.5 years of enrollment</li> <li>• Within the 1<sup>st</sup> year of enrollment</li> <li>• Within 3 years of enrollment</li> <li>• Within 3 years of enrollment</li> <li>• Within 3 years of enrollment</li> <li>• Within 5 years of enrollment</li> <li>• Within 5 years of enrollment</li> </ul>

More forms can be found at <http://gradschool.sc.edu/forms/>