Procedures, Requirements, and Standards

Appropriate Coursework

- Courses used to satisfy structured course requirements must receive a letter grade (i.e., not S, U, or W).
- Some departments other than ECE offer graduate level courses (6000 or above) with similar content to ECE graduate courses. In those situations, ECE graduate students must take the ECE version of the course. If the ECE course in question is not offered around the time of the graduating semester, then the student may be allowed to take the non-ECE version by general petition. Please see related deadlines on the department calendar.
- Graduate credit will not be awarded for both the ECE and non-ECE versions of a course.
- Courses offered by other institutions, such as Rice University/UT Health, etc., may be taken with prior approval from both the student’s advisor and the director of the graduate program if a similar class is not offered at UH. For permission to take a non-UH course, complete a general petition and an inter-institutional form, which are linked in our forms page.
- Courses taken for personal enrichment will not count towards the degree and must be approved by the advisor and the Director of Graduate Studies prior to enrollment. Enrichment hours cannot be used to satisfy minimum enrollment requirements when an assistantship is being received.

Academic Honesty
The academic honesty policies and procedures are described in the student handbook, which can be found at the Dean of Students website. Our department takes violations to the academic honesty policy seriously, especially plagiarism and cheating on exams, and will follow the procedures outlined in the handbook to prosecute violations.

### Leveling Courses

Leveling courses for all MSEE, Thesis and PhD students will be assigned on a case-by-case basis by the student’s advisor, in consultation with the specialization coordinator for the student’s area.

MSEE, Non-thesis students who do not have a Bachelor of Science in Electrical or Computer Engineering must show competency in four areas:

- Electronic devices
- Circuit theory
- Electromagnetics
- Computers

Students may accomplish this through leveling coursework. The Graduate Admissions Committee will identify leveling requirements with the assistance of the thesis advisor.

Competence in each area can be demonstrated by passing the following course(s) with a grade of B or better, respectively:

- Circuit Analysis (ECE 2201 and ECE 2202) and its Laboratory (ECE 2100)
- Applied EM Waves (ECE 3317)
- Signal & System Analysis (ECE 3337)
- Electronics (ECE 3355)
- Microprocessor Systems (ECE 4436)

The graduate level courses Microwave engineering (ECE5317) and Computer architecture (ECE5367) may be taken in place of Applied EM Waves (ECE3317) and Microprocessor Systems (ECE4436), respectively, with instructor permission.

### Enrollment

Graduate students must enroll in consecutive long semesters (i.e., Fall and Spring semesters) until the degree requirements are completed and the degree is awarded. Students who cannot enroll in a long semester must apply for a leave of absence. Please see the Graduate Catalog for more details.

The enrollment requirements for supported students are set by the college and can be found at the college website.

Key points from the college web site are:

- While non-supported students must be enrolled in at least 3 hours (U.S. students) or 9 hours (international students) during each Fall/Spring semester, summer enrollment is optional.
- Supported students must maintain a full time status, as defined by the College, in every semester (Fall,
Summer, and Spring).
- Supported Ph.D. students who have passed their qualifying exam may register for 9 hours instead of 12.

**Transfer of Credits**

Up to six hours of graduate-level work completed prior to acceptance to the graduate program (either at the University of Houston or elsewhere) may be transferred as credit as long as the courses were not used toward the completion of a previous degree. A student requesting credit transfer must file a general petition along with the course description, syllabus, and a copy of their transcripts showing the grade earned for the course within their first semester. Courses in technology programs cannot be transferred.

**Advising**

In the M.S. and Ph.D. programs, the faculty member charged with supervising research is called the *thesis or dissertation advisor*. In some cases, particularly in collaborative research with other departments or institutions, the thesis/dissertation advisor role may be split between an *academic advisor* in the department and a *research advisor* who is supervising the research project. In some cases, the Graduate Director may serve in these roles while a student searches for a permanent dissertation advisor, but this process must be completed before the end of the second semester.

It is *highly* recommended that students find a thesis advisor quickly if they want to complete their research in a reasonable timeframe. Students can change thesis advisors by receiving approval from the current and the new advisor through a general petition.

Graduate advising is *mandatory*, and the thesis/academic advisor approves all coursework during registration cycles before the start of each academic semester and ensures that good progress is being made in the student’s research project.

**Breadth Coursework**

Ph.D. students must complete, with a B or better, at least two graduate level courses in Electrical and Computer Engineering outside their area of research. These courses should be selected from the following approved list. Courses completed by the student as an M.S. candidate, while at UH or elsewhere, will be considered. (M.S. students may also fulfill the breadth requirements for their program by choosing ECE courses from the following approved list as long as the courses are from an area outside the student's specialization.)

- **Bio and Neuro Engineering**
  - ECE 6302 Introduction to Neuroengineering
  - ECE 6315 Neural Computation
  - ECE 6337 Introduction to Stochastic Processes

- **Communication and Networking**
  - ECE 6335 Digital Control Systems
  - ECE 6370 Advanced Digital Design
  - ECE 6390 Linear Multivariate Control Systems
• **Computer Engineering**
  ◦ ECE 6337 - Intro Stochastic Proc
  ◦ ECE 6346 VLSI Design
  ◦ ECE 6342 - Digital Signal Process
  ◦ ECE 6364 - Digital Image Processing

• **Controls and Robotics**
  ◦ ECE 6325 State-Space Control Systems
  ◦ ECE 6335 Digital Control Systems
  ◦ ECE 6397/6310 Introduction to Robotics

• **Electromagnetics**
  ◦ ECE 6340 Intermediate Electromagnetics
  ◦ ECE 6351 Microwave Engineering
  ◦ ECE 6352 Antenna Engineering
  ◦ ECE 6382 Engineering Analysis I

• **Microelectronics Circuits and Systems**
  ◦ ECE 6328 CMOS Analog Integrated Circuits
  ◦ ECE 6353 RF and Microwave Electronics
  ◦ ECE 6370 Advanced Digital Design
  ◦ ECE 6342 Digital Signal Processing

• **Nanotechnology**
  ◦ ECE 6306 Introduction to Nanotechnology
  ◦ ECE 6307 Nanomaterials and Solar Energy
  ◦ ECE 6314 Nanoscale Design & Fabrication
  ◦ ECE 6384 Micro-Nano-Electro-Mechanical Systems and Nano Devices

• **Optics and Photonics**
  ◦ ECE 6393 Biophotonics
  ◦ ECE 6358 Optoelectronics and Photonics: Principles and applications
  ◦ ECE 6323 Optical Fiber Communications

• **Power and Energy Systems**
  ◦ PES 6310/ECE 6305 Power Electronics Converters and Control
  ◦ PES 6330/ECE 6326 Power System Analysis
  ◦ PES 6340/ECE 6343 Renewable Energy and Distributed Power Generation
  ◦ PES 6332/ECE 6327 Smart Grid Systems

• **Signal and Image Processing**
  ◦ ECE 6335 Digital Control Systems
  ◦ ECE 6370 Advanced Digital Design
  ◦ ECE 6390 Linear Multivariate Control Systems
  ◦ ECE 6397/6310 Introduction to Robotics
  ◦ ECE 6339 Biophotonics

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**Qualifying Examination ? Ph.D. only**

Ph.D. students must pass a qualifying exam (QE), consisting of an oral and/or written component. The exact format of the exam is defined by the research groups and the advisor will inform the student what format is to be used. The qualifying exam is to be administered prior to the *fourth* long semester for a B.S.-Ph.D. student and prior to the *third* long semester for a M.S.-Ph.D. student. The qualifying exam committee must be approved by the Director of Graduate Studies before the QE can take place. Once the QE has taken place, the Chair of the
QE committee will inform the student and the Director of Graduate Studies on the outcome of the exam. If a student chooses to change advisors and has completed the qualifying exam, it is up to the new advisor to choose to accept the status or request that the student repeat the exam.

There are currently two exam formats, the General and the Electromagnetics formats. Please ask your advisor which you are to follow.

**General Qualifying Exam Instructions**

The exam committee will consist of the advisor and two additional members of the research group. The chair of the committee will be one of the members other than the advisor. The advisor, in consultation with the other committee members, will assign a small research project to the candidate, who may also receive an initial selection of relevant literature. The project should be assigned no later than the beginning of the semester in which the exam is to take place and should be designed to test the candidate’s ability to independently conduct research at a level commensurate with his/her education.

The candidate will prepare a written report and an oral presentation of the project results. The advisor may provide feedback during the preparation of the written report, but the report should be substantially the student’s own work. The report should include a critical review of the relevant literature, a statement of the problem, methods, results, and discussion. The length of the report should be similar to a standard journal paper. The report, copies of the most relevant literature, and a list of courses completed by the candidate should be given to the committee two weeks prior to the oral exam. The oral exam consists of a public presentation of the project, followed by a closed-door oral examination.

The candidate will either pass or fail the exam, and this decision, based on a majority vote of the committee, will be communicated to the candidate immediately after the conclusion of the exam. Failing students may request a second attempt. In that case, the committee will assign additional work, which should be completed (and presented) at the end of the next long semester. Should the student fail the second attempt as well, he/she will be dropped from the ECE department’s Ph.D. program. Once the student passes, he/she may proceed with the preparation of the dissertation proposal. Please note that the student’s dissertation advisor is not required to continue serving in that role after the student passes the qualifying exam.

**Qualifying Exam Instructions for Students Studying Electromagnetics**

The Applied Electromagnetics (EM) Group requires students do an oral examination as part of the department qualifying examination. As per department regulations, the exam should be taken before the end of the third semester of graduate work. The following guidelines should be followed in the administration of the exam.

1. The examination committee should consist of three or four faculty members, including the student’s advisor and the Chair of the Committee (the chair should be different from the advisor).
2. The exam should test over material covered in the following courses:
   - General electro- and magneto-statics, electromagnetic waves, and applied mathematics
   - ECE 6340 (Intermediate Electromagnetic Waves)
   - ECE 6351 (Microwaves) or ECE 6352 (Antennas)

   If the student has had both ECE 6351 and ECE 6352, then the student may choose which course the test will cover.

   No materials are brought to the oral exam.

3. The oral exam normally lasts two hours, and is interactive between the committee members and the students.
The outcome of the examination is either pass or fail, and this decision will be communicated to the candidate immediately after the conclusion of the oral exam. A majority vote is needed to pass the student (two out of three or three out of four). Students who fail the oral exam may request a second and final attempt, which must be taken before the end of the next long semester.

**PhD Qualifying Exam Instructions for Students Studying Power & Energy Systems (PES)**

The PES Group requires students do an oral examination as part of the department qualifying examination. As per department regulations, the exam should be taken before the end of the third semester of graduate work. The following guidelines should be followed in the administration of the exam.

1. The examination committee should consist of three or four faculty members, including the student’s advisor and the Chair of the Committee (the chair should be different from the advisor and at Associate Professor or higher level).
2. The candidate will give a presentation for about 40 minutes on the topics relevant to the research area. The candidate will be asked questions for about 20 minutes on the presentation.
3. After the presentation, the candidate needs to answer the questions from the committee on the materials covered in the following courses:
   - General power electronics, motors, power systems, and associated controls
   - ECE 6305 (Power Electronics Converters and Control)
   - ECE 6343 (Renewable Energy and Distributed Power Generation) or ECE 6326 (Power System Analysis)
4. The oral exam normally lasts two hours, and is interactive between the committee members and the students.

**Grade Point Average and Minimum Performance**

The grade point average (GPA) is computed as an average of all courses attempted at the university while enrolled in the graduate program. Graduate students must maintain an overall GPA of 3.0 or better in order to remain in good academic standing.

Should a student’s GPA fall below the minimum, an academic stop will be placed on the student’s record. Students must then seek assistance from their advisor to register and to have this stop removed when the GPA is greater than 3.0.

- **Minimum Cumulative Grade Point Average (GPA) for supported students** Students must maintain a cumulative GPA of 3.0 or better in order to remain eligible for GATF or in-state tuition waivers, when applicable.
- **Minimum Cumulative Grade Point Average (GPA) for scholarship students** Students must maintain a cumulative GPA of 3.0 or better in order to remain eligible for tuition waivers and scholarships.
- **Major Grade Point Average** This average is computed for courses that apply to the degree and must be 3.0 or higher prior to applying for graduation.
- **Four C-rule** The university has a specific rule regarding the maximum number of C+ or lower grades that a student may earn. The rule states,

A student who receives a grade of C+ or lower in 12 semester hours of credit attempt at
Dissertation and Thesis Guidelines

The Dissertation document is written as part of the Ph.D. degree program and the Thesis is written as part of the M.S. degree. The dissertation should be at such a level as to be a significant contribution to the field of knowledge in electrical and computer engineering, and worthy of publication in one of the recognized professional journals. This section describes the common elements in these documents and specifies any differences.

Here is a summary of the steps a student takes to complete this requirement.

1. Form a Thesis/Dissertation Committee
2. Write a Proposal and submit it to the Committee for approval. Ph.D. students must also defend their proposal orally
4. Defend the Thesis/Dissertation in a public setting with an announcement filed at least two weeks prior to the defense

More details for each step are provided in the next sections.

Committee

The student should form a Thesis/Dissertation Committee with the Advisor as chair as soon as the research topic is selected.

A Thesis Committee must consist of at least three members. At least two of the members must be faculty whose primary affiliation is ECE. The Committee shall consist of:

- the advisor (from within the ECE Department) as chair,
- At least one faculty member from within the ECE Department in addition to the chair. This member should be from the same general research area as the student.
- At least one additional member that is either from outside the ECE Department, or from within ECE but outside the research area of the student. This committee member can be from outside UH.

A Dissertation Committee must consist of at least five members. At least three of the members must be faculty whose primary affiliation is ECE. The Committee shall consist of:

- The advisor (from within the ECE Department) as chair.
- At least two faculty members from within the ECE Department in addition to the chair. These members should be from the same general research area as the student.
- At least one member that is from outside the ECE Department. This member can be from outside UH.
- At least one additional member that is either from outside the ECE department, or from within ECE but outside the research area of the student. This committee member can be from outside UH.

In either case, the advisor can assist the student in forming an appropriate committee. A committee form must be submitted well before the proposal defense is scheduled since the committee must be approved by the
Department and Dean?s Office prior to the defense. A student need not be enrolled while requesting to form a committee but must be enrolled when the defense takes place.

Should changes to the committee membership be necessary, the student simply submits an updated committee form listing all committee members. Only the new member(s) have to sign the form, but please complete this at least two weeks prior to defending the proposal or the Thesis/Dissertation.

Proposal

Once the Thesis/Dissertation Committee has been formed and approved, the student should prepare and, for Ph.D. students, defend a Thesis/Dissertation Proposal. During the semester where the proposal submission takes place, the student must be enrolled in ECE 6399 (MSEE) or ECE 8399 (Ph.D.). The Thesis/Dissertation Committee will approve the proposal by signing the Proposal Form. This form, together with a copy of the proposal document, has to be submitted to the ECE Department by the deadline specified on the semester calendar. The forms for the Thesis/Dissertation Committee formation and the Thesis/Dissertation Proposal defense can be obtained from the Department of Electrical and Computer Engineering.

The proposal document should outline the scope of the research, and it should contain, at least, a statement of the objectives, a review of the relevant literature, and a description of the principal methods to be used. Copies of this proposal should be provided to the members of the Committee.

Since the Committee may request substantial changes in the research objectives, the proposal should be prepared during the early stages of the dissertation research. In no case should a proposal and dissertation defense occur in the same semester.

After the successful defense of the Thesis/Dissertation Proposal, students should register for ECE 7399 (MSEE) or continue to enroll in ECE 8399 (Ph.D.). MSEE students should ideally enroll in ECE 7399 during the semester in which the thesis is defended and in which the student plans to graduate. The student should adhere to the thesis submission deadlines posted on the department calendar. In case the student does not complete the thesis while enrolled in ECE 7399, he/she should enroll in research courses (ECE 6x98) in future semesters until the thesis is completed to the satisfaction of the committee.

Thesis/Dissertation Document

When most of the research has been completed, the student should describe the main results to the committee and describe plans for the contents and structure of the thesis/dissertation. A student may request that the members of the committee review and comment on a preliminary version of the dissertation. This procedure is encouraged since it should provide the student with ideas of how to enhance the quality of the dissertation and should facilitate its acceptance.

When preparing the Thesis/Dissertation, it is critical to follow the guidelines defined by the College of Engineering.

A student should provide the members of the committee with the final version of the dissertation no later than two weeks prior to the dissertation presentation and defense. The student should be aware that he/she may be required to make substantial changes in the dissertation in order to satisfy the requirements of the committee.

Thesis/Dissertation Defense

Each candidate is required to present and defend his/her thesis/dissertation at a public meeting and post an announcement with an abstract with the ECE office at least two weeks before defense date. Please check with
the ECE Department for further details. The Thesis/Dissertation Committee will make the final judgment of the acceptance of the defense of the document.

The thesis/dissertation announcement is to let the public know that the student has completed successfully his/her research and that he/she is ready for graduation. The announcement must be distributed to all faculty and students. One additional copy must be submitted to the ECE Department for filing. Refer to the web site given for more information.

Note: The student may request that the members of the Thesis/Dissertation Committee review and comment on a preliminary version of the thesis. This practice is encouraged since it should provide the student with ideas on how to improve the quality of the thesis and should also facilitate its acceptance. The student is required to present the final draft of the thesis to the members of the committee no later than two weeks prior to the date of the thesis defense. The student should be aware that he/she may be required to make substantial changes, before and after the defense, in the thesis in order to satisfy the requirements of the committee.

Submission Form

Upon successful defense of the thesis, and once all signatures of the committee members have been obtained, the student must submit one copy of the thesis to the Director of Graduate Studies for review. A thesis submission form and this copy, together with the correct number of signature pages, must be submitted to the ECE front desk before the deadline stated in the Department calendar.

Obtaining ECE Department’s Chair signature

Once the thesis has been approved by the director of graduate studies, thesis and official signature pages will be submitted to the chairman for his signature. The student will be notified by staff for pick up. Department process for thesis submission is now complete. Students must now submit the Department approved thesis submission form with appropriate documents to the Dean’s office for review.

Official thesis submission for binding

The college web site provides instructions on how to submit the thesis once the dean’s office has given approval for binding. Once the student is at this stage, he/she must submit a copy of the thesis binding agreement received from the Dean’s office to the ECE Department so that appropriate letter grade(s) can be awarded.

Time Limits

The Ph.D. program must be completed within ten years of the date of enrollment at the University of Houston. In the event that the student cannot complete the program, he/she must request an extension by submitting a general petition. Along with the general petition, student must attach an outline of expired course(s), a date expected for graduation, and a current degree plan to the ECE department.

A Masters degree must be completed within five years of the date of enrollment at the University of Houston. In the event that the student is not able to complete the program, he/she must request an extension by submitting a general petition. Along with the general petition, the student must attach an outline of expired course(s), a date expected for graduation, and a current degree plan to the ECE Department.
For more information, please refer to the college guidelines.

**Reduced Hours in Final Semester**

Requests to enroll for fewer hours may be granted for non-supported students who have an approved degree plan on file showing that all degree requirements (except thesis or dissertation) have been completed, and who will defend their dissertation no later than the 12th day of class during the semester in question (approximately September 5, February 1, and June 10). All requests must be completed by general petition and submitted to the ECE Department before the deadlines indicated on the department calendar. Students must attach the following supporting documents.

- A copy of the dissertation defense announcement
- An approved degree plan for graduation
- An approved statement of your timeline for defense and graduation
- Reduced course load form from ISSSO office (if applicable)

Please note that full-time enrollment prior to the start of the semester is required for all students seeking an exception to enrollment requirements. The department will adjust the enrollment once the petition to enroll below the minimum hours has been approved.

**Applying for Graduation**

*Graduation is not automatic.* A student must apply for graduation through myUH during a semester in which they are enrolled. In addition to the official documents requested by the online application process, students must also submit a degree plan to the ECE Department by the department deadline. If the student discovers that (s)he will not be able to graduate during the semester for which the application was submitted, the student must send an email to the graduate advisor as soon as possible to revoke the graduation process. The application process must then be repeated (with updated forms and a degree plan).

**Curricular Practical Training (CPT)**

The ECE Department will recognize up to six hours of curricular practical training (CPT) credit in place of research courses (i.e., ECE 8x98) for Ph.D. students if all of the following conditions are met:

- Students need to be employed by an outside agency in order to collect data for their dissertation.
- The work is related to the practice of electrical and/or computer engineering and must be ?an integral part of an established curriculum.?
- A general petition is submitted before the start of the semester in which the student intends to participate in an internship. The petition must include a formal job offer, on the hiring company?s stationary, a description of the work to be performed, a beginning and ending date, and the salary offered.
  Ph.D. candidates must obtain approval from their dissertation advisor as well.
- The student is employed at no more than half-time (20 hours per week) during the fall and spring semesters. Full-time employment is allowed during the summer semester.
Please note that we cannot approve CPT under any other circumstances. For more information on the College and University requirements, please visit the ISSO, University and/or College sites.

Ph.D. students will not be able to apply for graduation in a semester where they are participating in a CPT program; students must return to campus prior to the beginning of the new semester.

### Leave, Withdrawal, and Reinstatement

#### Leave of Absence

Students must request a leave of absence from the graduate program when they are not able to register for a long semester. Requests are submitted through a general petition to the Graduate Admissions Office. Once approved, an academic stop will prevent future enrollment until the student has been reinstated.

Students should contact the office of the dean for individual college regulations on enrollment. A student who does not return to an enrolled status by the end of an approved period of leave will no longer considered to be pursuing an advanced degree.

A student who leaves the university without obtaining a formal leave of absence is not automatically readmitted. The recommendation of the department and the approval of the college/dean, based on the academic merits of the student’s request, are required. If readmitted, the student will be subject to all of the current requirements for the degree in effect at the time of readmission.

#### Medical Withdrawal

Students seeking a medical withdrawal should contact the department graduate office via email for instructions on how to proceed. All documentation must be in place prior to reinstatement. The department is very interested in hearing how the medical condition is progressing, so please remain in contact with us as you concentrate on improving your health.

#### Complete Withdrawal from the Graduate Program

Students leaving a program permanently prior to completing a degree should file a general petition requesting that their file be closed. Students will need to reapply as a new applicant in order to be considered for readmission. This process is not recommended for students who intend to return at a later time.

#### Change of Major

Students seeking to transfer to another department must file a general petition through the new department in order to have files transferred. An academic stop will remain on student’s record until this procedure is completed.

#### Change of Degree Objective/Plan within the Department

Students seeking a change in their degree plan will need to submit a general petition to officially request such a change. Their current advisor must initially approve the general petition. An approved request will only take
affect in the semester following its approval.

**Reinstatement**

Students seeking reinstatement should submit a general petition, a listing of completed courses, and an advising form indicating which courses will be taken during the semester for which reinstatement is sought. To avoid delay in preferred enrollment for the returning semester, a returning student should file his/her requests by the department’s graduate admission deadline. Student will be able to enroll when the petition is approved.

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