Graduate students are vital to the Department of Electrical and Computer Engineering's research efforts.

Faculty and their students are conducting research in three core electrical and computer engineering areas: devices and materials, electromechanical systems, and embedded systems. The department offers masters and doctorate degrees in electrical and computer engineering.

Admissions

In addition to the minimum Graduate School admission requirements, to be considered for regular admission an application must include:

1. A Bachelor's degree in electrical or computer engineering or related field from an ABET-accredited program. Applications who are graduates of a non EAC/ABET-accredited program will be considered.
2. A short Statement of Purpose describing possible research/study interests.
3. Resume.
4. Applicants who are not current University of Alabama students should submit three letters of recommendation.

Students who do not meet these requirements, but who excel in other areas, may be considered for "Admission with Permission to Continue."

Applicants Without an Electrical Engineering or Computer Engineering Bachelor's Degree

Applicants without an electrical engineering or computer engineering bachelor’s degree may be admitted with Permission to Continue.

Such students will be required to complete successfully three 400-level electrical engineering courses, each in a different sequence area. Successful completion requires a “B” or better in the course. Slash-listed (400/500) courses taken to satisfy this policy cannot be counted toward the graduate degree. Equivalent undergraduate or graduate courses in related fields (for example, electromagnetics in physics, computer architecture in computer science, or control in mechanical engineering) may be counted as a course in the corresponding electrical engineering area upon approval by the Electrical and Computer Engineering Graduate Program Director.

See the Admission Criteria section of this catalog for more information.

Curricular Requirements

The Master of Science in Electrical Engineering (MSEE) degree may be obtained through either of two plans. Students may also enroll in the Dual MSEE/MBA Degree Program, which includes a slightly reduced number of hours for both degrees.

MSEE – Thesis Option (Plan I)

<table>
<thead>
<tr>
<th>Code and Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Area of Concentration</strong></td>
<td></td>
</tr>
<tr>
<td>A minimum of 12 hours of closely related Electrical and Computer Engineering (ECE) designated courses in the student’s area of concentration, as defined by the advisory committee</td>
<td>12</td>
</tr>
<tr>
<td><strong>Elective Area of Study</strong></td>
<td></td>
</tr>
<tr>
<td>A minimum of 9 hours of courses in an elective area approved by the advisory committee</td>
<td>9</td>
</tr>
<tr>
<td>Mathematics or Science</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A minimum of 3 hours of Mathematics (MATH or GES) or Science (Physics, Chemistry, or Biology) courses at the 500 level or above | 3     |

Graduate Research Seminar

A minimum of 1 hour of seminar (ECE 695 Graduate Research Seminar). This can be part of the Area of Concentration or the Elective Area of Study.

Total Coursework Hours | 24
Thesis Course          | ECE 599 Thesis Research | 6
Total Hours            | 30

Additional Requirements:

- A minimum of 3 hours of closely related Electrical and Computer Engineering (ECE) designated courses in the student’s Area of Concentration at 600 level.
- No more than 6 hours may be from courses at the 400 level. In order to receive degree credit, 400-level courses require written application and approval by the Graduate School prior to the semester in which any 400-level course is to be taken.
- The Graduate Research Seminar can be considered as part of the student’s Area of Concentration or Elective Area of Study with approval from the student’s advisory committee.
- A student’s curriculum and thesis must be approved by the student’s graduate advisory committee. The student must pass a final comprehensive examination, which is typically a presentation and defense of the thesis. In addition, the student must satisfy all University requirements defined in the current edition of The University of Alabama Graduate Catalog.

The MSEE Plan I candidate’s committee will consist of three department faculty who have each taught the candidate at least one graduate course. The MSEE Plan I candidate’s committee is responsible for administering the thesis defense.

MSEE – Non-Thesis Option (Plan II):

<table>
<thead>
<tr>
<th>Code and Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Area of Concentration</strong></td>
<td></td>
</tr>
<tr>
<td>A minimum of 12 hours of closely related Electrical and Computer Engineering (ECE) designated courses in the student’s area of concentration, as defined by the adviser</td>
<td>12</td>
</tr>
<tr>
<td><strong>Elective Area of Study</strong></td>
<td></td>
</tr>
<tr>
<td>A minimum of 12 hours of courses in an elective area approved by the adviser</td>
<td>12</td>
</tr>
<tr>
<td>Mathematics or Science</td>
<td></td>
</tr>
<tr>
<td>A minimum of 3 hours of Mathematics (MATH or GES) or Science (Physics, Chemistry, or Biology) courses at the 500 level or above</td>
<td>3</td>
</tr>
</tbody>
</table>

Graduate Research Seminar

A minimum of 1 hour of seminar (ECE 695 Graduate Research Seminar). This can be part of the Area of Concentration or the Elective Area of Study.

Culminating Experience

ECE 598 Non-Thesis Research | 3
Total Hours                | 30

Additional requirements:
• A minimum of 3 hours of closely related Electrical and Computer Engineering (ECE) designated courses in the student’s Area of Concentration at 600 level.

• No more than six (6) hours may be courses at the 400 level. In order to receive degree credit, 400-level courses require written application and approval by the Graduate School prior to the semester in which any 400-level course is to be taken.

• The Graduate Research Seminar can be considered as part of the student’s Area of Concentration or Elective Area of Study with approval from the student’s advisory committee.

• A student’s curriculum must be approved by the student’s graduate adviser, which must be chosen during the first semester of the degree program.

• The graduate adviser must also approve either of the following to satisfy University of Alabama Graduate School culminating experience requirement for an MS Plan II degree:
  a. submission of a manuscript, authored or co-authored by the candidate, to a refereed journal or conference proceeding;
  b. a written research report submitted to the adviser.

During the first semester in the MSEE Plan II program, the candidate must select an adviser from the department faculty who will be responsible for administering the culminating experience.

Transfer Credit
Please see the Graduate School information on Transfer Credit.

Accelerated Master’s Program
Current Electrical Engineering and Computer Engineering undergraduate students at The University of Alabama with a 3.3 or higher GPA and 90 or more hours of undergraduate course credit are eligible to apply for the Accelerated Masters Program (AMP). AMP allows undergraduate students to simultaneously count up to 6 hours of graduate coursework toward both the undergraduate and graduate degrees. The GRE admissions test and recommendation letters requirements are automatically waived for AMP applicants.

Please see the Graduate School catalog page for the Accelerated Master’s Program.

Comprehensive Exam/Capstone
A final comprehensive examination is required of all Master’s candidates. The content of this exam depends on the candidate’s degree program.

Every MSEE candidate (Plan I) is responsible for working with their advisor to select a faculty committee to oversee the candidate’s progress toward earning the MSEE degree. The MSEE Plan I candidate’s committee will consist of at least three members of the faculty. At least two of the members must be from the ECE Department faculty. Up to one member may be from outside the department. The MSEE Plan I committee will work with the advisor to approve the candidate’s plan of study, evaluate the candidate’s thesis and thesis defense, and help the candidate with any problems that may arise in the course of obtaining the MSEE degree.

The MSEE Plan II candidate does not have to form a committee, but instead select an adviser from the members of the ECE Department’s faculty. The adviser will be responsible for administering the culminating experience.

Plan I – Thesis Process Requirements

Thesis
The thesis is a formal research document and must be prepared following the Graduate School’s thesis and electronic submission guidelines (http://services.gvsu.edu/ets/). Your thesis will be reviewed by your thesis advisor and your committee. Once they are satisfied with the thesis, you and your thesis advisor will schedule your Comprehensive Exam/Thesis Defense. After successfully defending your thesis, you may have final corrections and revisions to your thesis before the committee gives their final approval. Such conditions should be considered in scheduling the presentation/defense relative to the graduate school submission deadlines.

Thesis Defense
The final step in the pursuit of the M.S. degree (Plan I) is a formal defense of the completed thesis before the student’s graduate advisory committee. The thesis defense consists of two major components.

The first component is a technical presentation that summarizes the major findings of the thesis. This presentation should include a survey of the available literature and a summary of the major technical achievements of the research. The technical presentation is followed by a question and answer session, during which audience members may ask the student specific questions about his or her thesis research. This portion of the defense must be open to the public.

The second component of the thesis defense is a closed question & answer session that is restricted to the defending student and the graduate advisory committee. This portion of the defense is not open to the public. The graduate advisory committee will typically ask a series of detailed questions about the student’s research. After the committee has concluded asking questions, the student will be asked to leave the room so that the committee may deliberate and render a decision on whether the student has passed or failed the defense. After a decision has been reached, the student will be called back into the room and notified of this decision.

The thesis defense must be announced publicly. The procedure for public announcement is as follows. No less than four weeks before the scheduled defense date, the student must complete a thesis announcement document, which includes the following elements: the student’s name, the student’s email address, the advisor’s name, the thesis title, and abstract of no more than 300 words, and the scheduled date and time of the defense. A template of this announcement form is available from the ECE office staff.

When the thesis announcement document is complete, it should be sent to the ECE office staff for distribution. This will generally be done at the same time that the room reservation for the defense is scheduled. To ensure that this policy is enforced, ECE office staff will not schedule a room for a thesis defense without first receiving the completed thesis announcement document. After receiving this document, the ECE office staff will add the confirmed room location, and will then send this document to the department email distribution list. The document will also be posted to the ECE department website and sent to the office of the dean for further distribution within the college of engineering.

Plan II – Non-Thesis Process Requirements

Plan II Master’s candidates can satisfy the comprehensive exam via one of the following:
• Pass a formal defense of a conference or journal paper in which the student is an author. The student must meet with the adviser and report on their portion of the work described in the paper. The specific format of this exam is at the discretion of the adviser.
• Submit a written research report on the topic defined by the academic adviser, taken as 3 hours of ECE 598 Non-Thesis Research.

**Time Limits for Degree Completion Requirements**
Please see the Graduate School catalog page for information on Time Limits.

**Student Progress Requirement**
Please see Satisfactory Academic Progress Website.

**Academic Misconduct Information**
Please see the Graduate School catalog page for information on Academic Misconduct.

**Withdrawals and Leave of Absence Information**
Please see the Graduate School catalog page for information on Withdrawals and Leave of Absence.

**Academic Grievances Information**
Please see the Grievance Procedure catalog page.

**Scholastic Requirements**
Please see the Graduate School catalog page for information on Scholastic Requirements.

**Graduate School Deadlines Information**
Please see the Graduate School Website.

**Application for Graduation Information**
Please see the Graduate School catalog page for information on the Application for Graduation.

**Master's Degrees**
The primary purpose of master's degree programs is to provide students with subject matter at an advanced level in their fields of study. Master's degrees are designed to assist students either to continue their graduate studies or to meet the goals of their professions. In most cases, master’s programs also help students become familiar with methods of independent investigation.

**Program Requirements**
Two plans are offered for the master’s degree:

**Plan I.** Candidates for the master’s degree under Plan I must earn a minimum of 24 semester hours of credit in coursework plus earn a minimum of 6 additional hours of thesis research hours, for a total of 30 hours.

**Plan II.** Candidates for the master’s degree under Plan II must earn a minimum of 30 semester hours of coursework credit and pass the comprehensive examination or complete a culminating or “capstone experience” as described under the Comprehensive Examinations section below.

Both plans require a minimum of 18 semester hours in the major subject. With the approval of the major department, the remainder of the coursework may be completed in either the major or a related field.

In some divisions and in many departments of the University, candidates are required to do their work under Plan I. Candidates working under Plan II may be required to participate successfully in seminar or problem courses that will give them an acquaintance with the methods of research and an appreciation of the place and function of original investigation in the field.

**Residency Requirements**
A student’s program at the master’s level must provide sufficient association with the resident faculty to permit individual evaluation of the student’s capabilities and achievements.

**Graduate Credit**
A student must be admitted to the Graduate School and must register as a graduate student in order to receive graduate credit. Approval for graduate registration must be obtained from program advisors prior to registration.

**Graduate Credit for Noncredit Experiences**
All course credit used toward a UA graduate degree must be taught at the graduate level. No graduate credit may be earned for experiential learning not conducted under the direct supervision of graduate faculty of The University of Alabama. UA does not offer graduate credit for noncredit workshops, seminars, continuing education experiences, professional development, internships, work/life experience, and so forth.

**Transfer of Credit**
Courses of full graduate-level credit earned in a regionally accredited institution where a student was enrolled in the graduate school, may be submitted for review for inclusion in a master's degree program. Evaluation of credit for transfer will not be made until after the student has enrolled in the Graduate School of The University of Alabama. Acceptance of credit requires the approval of the student's advisory committee and the dean of the Graduate School.

A student initiates the Request for Transfer of Graduate Credit form and must ensure that the Graduate School receives an official transcript from the outside institution. This should be done well in advance of the final semester, otherwise it may delay graduation and awarding of the degree.

With the approval of the student’s department and the dean of the Graduate School, the greater of 12 hours or 25 percent of the required coursework for a master’s degree may be transferred from an outside institution. Some master’s degree programs allow fewer hours to be transferred. Be sure to check with your department’s graduate program director regarding your department’s transfer policy. Eligible coursework will have been earned during the six-year period (18 fall, spring and summer semesters) preceding the semester of admission to the UA master’s program. Only courses in which a student earned a "B" grade or better may be transferred. Thesis Research (599) may not be transferred in from an outside institution. If approved, such coursework can be counted toward the minimum hours and coursework requirements for the master’s degree.

In some cases, foreign educational credentials may not meet the Graduate School’s criteria for transfer of credit. It may be necessary for students in this situation to secure an evaluation of their credentials from World Education Services Inc. (WES), an external foreign credential evaluation service. Additional information on their services can be found at their website.
400-Level Courses
A maximum of 6 semester hours of 400-level course credit may be accepted for graduate credit and used toward a master's degree. The department needs to submit the Approval of 400-Level Course Work for Master’s Credit form through the UA DocuSign system in myBama. This form must be submitted for approval to the Graduate School by the last day to add a course for the semester in which the course will be taken.

Time Limit
All requirements for the master's degree must be completed during the six years (18 fall, spring, and summer semesters) immediately preceding the date on which the degree is to be awarded. Previously approved transferred coursework that falls within six years of admission to the master's degree program can be counted toward the minimum hours requirement. There is no provision for an extension of the time limit beyond six years for master's students.

Revalidation of Expired Credits
There may be particular and limited instances where a student is re-admitted to a graduate program, and revalidation of expired credits is justified. In such cases, where the department and Graduate School feel it is appropriate to do so, the student may work with the graduate program director to petition for such revalidation, on a course-by-course basis. For each course for which revalidation is requested, the student must demonstrate, to the department's satisfaction, that the knowledge and skills gained in that course are still current. Currency will be evaluated by a committee of faculty, composed of at least three graduate faculty members within the degree program to which the student is requesting re-admission, and two from a separate department.

The committee will then issue a recommendation to the dean of the Graduate School, who will rule on the petition.

Some methods for demonstrating currency may include but are not limited to 1) a professional portfolio; 2) an exam or essay linked to each course and demonstrating up-to-date knowledge; 3) a re-take of the comprehensive exams under current program guidelines, and/or 4) other methods deemed appropriate by the committee.

Students may request revalidation of up to 50% of the required minimum coursework for their degree. Credits earned from an institution other than The University of Alabama may not be revalidated.

Consideration of revalidation, and a plan of study based on the demonstration-of-currency and other remaining requirements, must be completed as part of the student's re-admission to the Graduate School. Revalidation of credits is not guaranteed. From the time of re-admission, students must complete the degree within the standard time limit, as specified in the Graduate Catalog at the time of the student's re-admission.

Thesis
A thesis evidencing research capacity, independent thought, and the ability to interpret materials is required of all master's degree candidates who pursue Plan 1. The subject chosen must be in the major field and must be approved by the graduate committee of the major department or school and by the head of the student's major department or division.

A thesis committee must consist of at least three members appointed by the dean of the Graduate School. Students set up their committee through the Graduate Academic Activities portal on the Graduate School website. The request normally is made as soon as the successful defense of the thesis proposal has been completed. All members of a thesis committee must be members of the Graduate Faculty. The Committee Chair must be a full or associate member of the Graduate Faculty. One member must be from outside the student’s major department. The majority of the thesis committee must be full-time regular University of Alabama faculty. If the outside member is not a full or associate member of the UA Graduate Faculty (e.g., a highly qualified person from another university, a business, or industry), the graduate dean needs to appoint that member by approving Affiliate Graduate Faculty status for the specific purpose of serving on the student's thesis committee. Unless there are extraordinary circumstances meriting approval by the graduate dean before the final oral defense of the thesis, all members of the thesis committee must attend the defense.

The candidate must give members of the examining committee a minimum of two weeks to read the thesis before the date of the final oral examination. All members must agree that the student is ready for the final oral thesis defense. A final oral thesis defense is required of all students completing a thesis. All members of the thesis committee must be members of the UA graduate faculty and must attend the final oral thesis defense unless there are extraordinary circumstances warranting the graduate dean's approval of the absence prior to the defense meeting.

The final oral thesis defense is the culminating experience in the master's program. As such, all members of the thesis committee are expected to attend and participate in real time. Virtual attendance via interactive video or teleconference is permitted for off-campus external committee members, but the student and Tuscaloosa campus faculty should attend in person unless extraordinary circumstances dictate the need for virtual attendance. In circumstances where virtual participation is necessary, all participants must follow the Virtual Participation guidelines found below.

Virtual Participation in Committee-Based Exams/Defenses
All members of a student's graduate committee are expected to attend and participate, usually in person, in any oral examination as part of the student's graduate (Master's or Doctoral) degree program. Traditionally, oral examinations are conducted with the student meeting their committee while gathered in one physical location on campus. However, the need occasionally arises for virtual participation in the oral examination.

If a department or program chooses to allow virtual participation in oral examinations, they must ensure adherence to the following technical requirements. Departments or programs may enforce stricter guidelines than those outlined, including an on-campus-only policy if deemed necessary and appropriate.

Technical Requirements
In cases where departments or programs allow any level of virtual participation, from one virtual member to a fully virtual event, they must adhere to the following requirements:

1. Prior to any oral exam, the student and Committee Chair coordinate with other committee members regarding the protocol for the exam.
2. All participants must join using university-adopted videoconferencing tools that allow for fully interactive audio and video communications along with screen-sharing capabilities, which must be maintained throughout the examination and any related discussion.
3. The use of audio-only communications is not permitted.
4. Participation merely by viewing a recording of the oral examination is specifically prohibited.
5. All members of the committee, on- or off-site, must participate in the final evaluation of the examination or defense; provisions must be made to record their votes and collect their signatures as necessary using the digital signature system approved by the Graduate School.
6. The Committee Chair, or another non-student designee, shall be the host of the virtual meeting. A co-host may be assigned so that the event will not be interrupted by technical difficulties. The host should mute all participants (or ask participants to mute themselves) and ask the student to share their screen, if a presentation is involved, in order to make the presentation visible to all attendees. The host must also ensure that appropriate security precautions are taken to prevent the interruption of the event.

7. Following the public portion of the defense, the host shall ask all non-committee members to leave the meeting, or the host may manually remove them. In programs where the defense has both a public and a private portion, the committee may then continue the event as outlined in their program protocols.

8. Once the committee has completed the examination of the student, the host shall place the student into the waiting room (or have the committee members use a breakout room) so the committee can conduct their deliberations in private.

The committee chair must have a secondary videoconferencing system available as a back-up in the case of technical difficulties. Cancellation of the examination should only occur in the case where both the primary and secondary back-up systems fail. If an examination must be rescheduled, it will be done without prejudice to the student. Since committee deliberations are an essential aspect of the examination, completing the examination and final discussion via email or other non-audiovisual means is not an option. If the student or any committee member(s) have a disability that will be impacted by virtual participation, accommodations for participation must be provided.

**Article Style vs. Journal Format for Master's Theses**

**Article Style.**

At the doctoral level, "article-style dissertations" are unified works that include several distinct but related studies of research or creative activity, each of which is of publishable quality. The University does not permit an "article-style thesis" to be presented for a master's degree.

**Journal Format.**

A "journal-format thesis" is acceptable. Such a thesis follows the format of a particular journal in which the student and advisor want the thesis to be published. To prepare a journal-format thesis, the student uses the journal’s "information for authors" or similarly titled guidelines in conjunction with the Graduate School’s Student Guide to Preparing Electronic Theses and Dissertations.

All theses are submitted electronically rather than on paper. See the Graduate School’s homepage for a link to information on Electronic Theses and Dissertations (ETD) for details.

Theses must comply with the regulations set out in A Student Guide to Preparing Electronic Theses and Dissertations, available on the Graduate School’s website. Approval of the thesis by the graduate dean is necessary before graduation.

The thesis should be completed, if possible, while the student is in residence at the University. To request permission to complete a thesis in absentia, the student must, before leaving the University, submit a satisfactory outline of the thesis, as well as evidence that adequate facilities are available where the work will be done, to the head of the student’s major department.

**Protection of Human Subjects for Research**

Scientific research involving human subjects has produced substantial benefits for society, but it also can pose troubling ethical questions. The mission of the University's Institutional Review Board (IRB) for Protection of Human Subjects is to ensure that research involving human subjects is conducted ethically. University and federal policies require that review and approval to use human subjects in research precede the research.

In the case of thesis research that involves the use of human subjects in any way, the principal investigator is responsible for contacting the college Human Research Review Committee to obtain approval for the planned research.

**Final Thesis Defense**

The final oral thesis defense is the culminating experience in the master's program. As such, all members of the thesis committee are expected to attend and participate in real time. Virtual attendance via interactive video or teleconference is permitted for off-campus external committee members, but Tuscaloosa campus faculty should attend in person unless extraordinary circumstances dictate the need for virtual attendance. The thesis must comply with the regulations in A Student Guide to Preparing Electronic Theses and Dissertations.

"Completed" means submitted to ProQuest after being successfully defended, carefully edited following the defense meeting, and having the Committee Acceptance Form (CAF) signed by all committee members, department chairperson, and graduate dean. A majority of the thesis committee must approve the written thesis and defense before submission to the Graduate School. Following the thesis defense, the Committee Acceptance Form is submitted by the thesis chair through the UA DocuSign system in myBama.

Graduate School deadlines, including each semester’s thesis deadline, are available at the Graduate School’s homepage. Consult the ETD website for details of ETD submission, including information on what needs to be submitted to the Graduate School. The graduate dean must approve the thesis before the student can be cleared for graduation.

**Comprehensive Examinations**

In addition to the regular course examinations, a final comprehensive examination representing a "culminating" or "capstone" experience for a degree is required of all candidates for the master's degree (except for those candidates pursuing the Master of Accountancy, the Master of Business Administration, the Master of Library and Information Studies, the Master of Social Work, and the Master of Tax Accounting). The comprehensive examination is a culminating experience in which the student is expected to integrate prior learning. Each department, with approval of the Graduate Council, determines the most appropriate format. The various exams may consist of one or more of the following:

- a written and/or oral examination based on the content of the degree program;
- a thesis and final oral defense;
- a course requiring interpretation and integration of information from previous courses;
- a research paper, a "policy and practice" paper, or equivalent experience;
- a public performance or exhibition along with a contextualizing paper; and/or
- a practicum or internship.

If the comprehensive exam requirement is met with option 1 and/or 2 above, then the examining committee for comprehensive examinations must consist of at least three members of the graduate faculty from that department and appointed by the dean of the Graduate School.

The examination must be given at least six weeks before the date of graduation (two weeks before for Plan II) and reported promptly to the
The final report is submitted by the department through the UA DocuSign system in myBama. The form should be submitted when all examinations are completed. A student may take the final oral or written examination only twice. Failing the examination twice results in dismissal from the degree program and the Graduate School.

**Application for Graduation**
Each candidate for a master's degree must submit an Application for Degree via myBama no later than the last day to add a course for the semester (or first term of the summer semester) in which requirements for the degree are to be completed. That specific date is published each semester at the Graduate School’s website under Current Students/Deadlines for Graduate Students.

**Second Master's Degree**
Six (6) semester hours of eligible credit from one master's degree at The University of Alabama may be applied to the requirements for a second master's degree, but only if the department of the second master's agrees to the courses in the plan of study. Any hours from the previous master's degree must have been earned during the six years (18 fall, spring, and summer semesters) immediately preceding the date on which the second degree is to be awarded. ***Please note that if a student double counts six hours between two master's degrees, no hours may double count toward any additional master's degrees.