



MISSISSIPPI STATE
UNIVERSITY™

Department of
Electrical and Computer Engineering

GRADUATE HANDBOOK

2012–2013



Welcome

On behalf of the faculty and staff of the Department of Electrical and Computer Engineering, I welcome you to the graduate program at Mississippi State University. We hope you will have a stimulating and enjoyable experience in our department and at MSU.

This handbook contains data and information useful to all. The members of the ECE faculty and administrative staff are available to help you by answering questions and providing further information. The university's Office of the Graduate School is also at your disposal to answer your questions; much additional information can be found in *The Graduate School Bulletin* published yearly by the Office of the Graduate School. You will also want to consult the graduate information at the department's website (<http://www.ece.msstate.edu>) as well as the website for the Office of the Graduate School (<http://www.grad.msstate.edu>). In particular, the forms you will need to complete throughout your graduate study can be found at these two websites.

We hope that you find the graduate program to be both exciting and challenging. As an ECE graduate student, you are a member of a highly capable and motivated group. You will find your graduate-student colleagues to be a stimulating group and interaction with them to be a valuable component of your professional growth. Feel free to ask one of the department's graduate ambassadors (see below) your questions about the department, program, faculty, or even graduate student life at MSU.

The faculty and staff of the Department of Electrical and Computer Engineering at Mississippi State University look forward to working with you, both inside and outside the classroom.



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Special Note

The information and guidelines in this handbook are not intended to negate or contradict any rules of the Office of the Graduate School. All students should consult the current edition of *The Graduate School Bulletin* and be cognizant of all university policies therein.

Special Note

Effective with the Fall 2012 semester, the Department of Electrical and Computer Engineering no longer offers separate Electrical Engineering (EE) or Computer Engineering (CPE) degrees at the graduate level. Starting Fall 2012, these degrees are combined as Electrical and Computer Engineering (ECE).

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1. General Information and Policies

1.1 Academic Performance

To be in good academic standing, students must maintain a cumulative graduate GPA of 3.0. Grades below B on graduate work are not considered to be good progress; a grade lower than a B will normally result in a warning letter.

1.2 Academic Probation

If a graduate student's cumulative GPA falls below 3.0, the student will be placed on academic probation. Additionally, a student who obtains a grade below a B on a prerequisite course will be placed on academic probation. While on probation, a student will not be eligible to receive any type of financial support (teaching or research assistantships, fellowships, wages, etc.).

On-campus students: To be removed from academic probation, the on-campus student must, by the end of the next semester (the summer is counted as one semester), raise his or her cumulative GPA to 3.0 and earn a grade of B or above on any prerequisite courses for which a grade lower than B was previously obtained. Note that if a student's initial admission is provisional or if a student is on probation, he or she must carry a course load of 9 credit hours of coursework.

Distance students: To be removed from academic probation, the distance-education student must, over the next 9 hours taken, raise his or her cumulative GPA to 3.0 and earn a grade of B or above on any prerequisite courses for which a grade lower than B was previously obtained.

1.3 Academic Dismissal

A student will be dismissed from the graduate program if any of the following occur:

- a student has been on academic probation at some point in the past and, in some subsequent semester, the student's cumulative graduate GPA falls again below a 3.00
- a student receives a grade of D, F, or U on a graduate course
- a student receives a grade of C on more than two graduate courses
- a masters student fails the non-thesis comprehensive examination twice
- a masters student fails the thesis defense twice
- a doctoral student does not pass the qualifying examination within the first four semesters of full-time doctoral enrollment
- a doctoral student fails the oral preliminary comprehensive examination twice
- a doctoral student fails the dissertation defense twice
- a student receives an unsatisfactory evaluation of a thesis or a dissertation
- a student fails to take a prerequisite course in the required semester or earn a grade of B or above on any prerequisite courses for which a grade lower than B was previously obtained

In case of a dismissal from the graduate program, a student may appeal his or her academic status according to the following procedure:

Within four weeks of being notified of the official dismissal, the student must present the request and related explanation in writing to the department head and the graduate program director. The department head and graduate program director will review the appeal with the ECE graduate committee and render a recommendation. If the appeal at the departmental level is unsuccessful, a student may then appeal to the college dean. If the appeal at the college level is unsuccessful, the student may then appeal to the Provost and Vice President for Academic Affairs.

1.4 Application for Admission

Students apply for admission to graduate study at Mississippi State University online at the website for the Office of the Graduate School, <http://www.grad.msstate.edu>. Since the Office of the Graduate School handles all application materials, send all materials to the Office of the Graduate School; do not send any materials directly to the Department of Electrical and Computer Engineering or to the Bagley College of Engineering. Contact the Office of the Graduate School for questions regarding the application for admission process or what materials are required to be submitted with an admission application.

1.5 Building Access

Electronic access to Simrall and certain laboratories is provided to students using university ID or keypad entry. Anyone permitting guests to enter the building after hours (5pm–7am) is reminded that they are responsible for the actions of those persons.

1.6 Course Load

To be classified as a full-time student by the university, a student must be enrolled in 9 or more credit hours during a regular semester (spring or fall).

A normal graduate course load is considered to be 13 credit hours. Greater than 13 credit hours is considered overload, and students are charged for credit hours in excess of 13. The maximum load in the spring or fall semester is 16 credit hours. In a five-week summer term, the maximum is 7 credit hours.

Teaching assistants, research assistants, and those holding fellowships within the Department of Electrical and Computer Engineering are required to enroll in 13 credit hours in the spring and fall semesters, and a minimum of 6 credit hours in the summer, except when the student takes an ESL course (see below). Thesis/dissertation research hours with any professor can be used to meet this load requirement. For summer enrollment, the student can register for 6 hours in the 10-week summer term, or a combination that sums to 6 hours in the two 5-week terms.

All international graduate students must be enrolled in 9 credit hours to be considered full-time graduate students under immigration laws. No international graduate student may drop below 9 credit hours without first informing their major professor and obtaining a written statement of permission. In addition, the student must obtain permission from the International Services Office. International students already attending Mississippi State University before the summer semester who are in good standing are not required to take

courses in the summer semester. Those entering the university for the first time in the summer semester must take a minimum of 6 credit hours. Students are advised to consult with the International Services Office to verify their minimum course load.

Special Note Concerning ESL: If a student is enrolled in an English as a Second Language (ESL) course, the university limits the course load for that semester to 9 hours. Enrolling in more than 9 hours when an ESL course is part of a student's schedule will result in the student being billed for extra tuition (several thousand dollars) above the normal tuition amount. This extra tuition is not covered by any assistantship tuition waiver.

1.7 Directed Individual Study

In order to take ECE 7000 Directed Individual Study, a student must apply for approval by submitting to the graduate program director a signed *ECE Directed Individual Study Form* form. The deadlines for submission of this form are as follows:

November 15	Spring semester enrollment
April 15	Summer term enrollment
July 15	Fall semester enrollment

Notes:

- Students cannot take ECE 7000 during their first semester of enrollment in the department.
- A student may take only one Directed Individual Study course in a semester; only two Directed Individual Study courses may count toward a Program of Study.
- A faculty member in the Department of Electrical and Computer Engineering may not offer more than two Directed Independent Study courses in a single semester.
- Students who take Directed Individual Study under a professor in the Department of Computer Science and Engineering must enroll in CSE 7000 and must contact the graduate program director in that department for relevant procedures.

1.8 Graduate Assistantships

Teaching assistantships (TAs) are awarded by the department to qualified outstanding students. All students applying to the graduate program are automatically considered for TA positions, and a decision is made only after a student's complete application materials are reviewed. To be eligible to serve as a TA, students must pass the required certifications offered by the Office of the Graduate School—domestic students must pass the Graduate Teaching Assistant Orientation (held prior to both fall and spring semesters); international students must pass both the Classroom Communication & Culture Workshop (held prior to fall semester only) as well as the Graduate Teaching Assistant Orientation. A student cannot serve as a TA until he or she passes all parts of the required certifications and is certified at the TA-2 level. An international student must enroll in ESL 5323 Academic Research and Writing during the first semester that he or she serves as a TA unless he or she has an undergraduate degree from an accredited US institution.

Research assistantships (RAs) are awarded by faculty members with research funding. Students are encouraged to contact faculty members within their area(s) of interest to learn more about research activities and possible support. Often, research assistantships are extended to students only following classroom experience with the sponsoring faculty.

Any graduate student being employed as a graduate assistant may not be employed more than one-half time (i.e., 20 hours per week) total employment by the university as a whole. Any student so employed must notify all departments involved before accepting such employment by more than one department within or outside of the Bagley College of Engineering. Additionally, any graduate student employed as a graduate assistant working the maximum 20 hours per week cannot also be employed outside of the university without prior approval from the Office of the Graduate School.

Any student paid less than \$600.00 per month is paid on a wages basis; such wages support is not considered to be a graduate-assistant appointment (see “Student-Worker Positions” below).

Students with provisional admission or on academic probation are prohibited from holding graduate assistantships. Graduate assistantships are subject to immediate termination or adjustment when a student receives a grade below B on any prerequisite or graduate course; drops below a 3.0 GPA in any semester; fails to perform his or her assigned duty in a satisfactory manner; or funds for support of the assistantship become unavailable in the department.

In order to receive graduate-assistantship support during the summer, a student must be registered as a full-time graduate student (13 hours) for the subsequent fall semester, unless the student is graduating that summer semester.

An international student must have a current I-9 on file with the university to be employed in any status. The university will immediately terminate a student’s employment upon the expiration date of his or her I-9, unless a new I-9 has been completed.

1.9 Program of Study

It is the responsibility of each graduate student to develop a suitable program of graduate study in conjunction with the student’s major professor and graduate committee. This program of graduate study must be documented with the submission to the graduate program director during the first semester of graduate enrollment of a *Graduate Program of Study* form signed by the student and his or her entire graduate committee. Changes to the program of study require approval and must be documented with the submission to the graduate program director of a new *Graduate Program of Study* form signed by the student and his or her entire graduate committee. Note: the Department of Electrical and Computer Engineering does not accept the *Change to Graduate Program of Study* form.

1.10 Registration for Courses

Currently enrolled students must preregister for the next fall or spring semester’s courses online using Banner. Course registration will require use of the student’s Registration Access Code (RAC) which can be obtained by contacting the graduate program director. The RAC will not be released until the student has submitted completed and signed *Graduate Program of Study* and *Committee Request* forms; both forms must be current and updated.

The ECE department requires all currently enrolled graduate students to be preregistered for class by the last day of classes of the preceding semester:

<i>Semester</i>	<i>Preregistration Deadline</i>
Fall	Last day of Summer semester
Spring	Last day of Fall semester
Summer	Last day of Spring semester

Note that it costs a student nothing to preregister for classes—students will not be billed for tuition until after the next semester starts. Also, note that a student will always be able to adjust his or her schedule by adding or dropping class up through the first week of class.

1.11 Report of Examination Results Forms

Report of Examination Results forms are to be submitted directly to the graduate program director by the major professor. Students are not permitted under any circumstances to handle *Report of Examination Results* forms.

1.12 Schedule Changes

Course changes after the regular deadline are usually not allowed. After the regular deadline, changes must be approved by the dean of the Bagley College of Engineering and the dean of the Graduate School. A signed Add/Drop form must be submitted to the dean along with a justification letter from the student's major professor.

1.13 Student-Worker Positions

Any student paid less than \$600.00 per month must be paid on an hourly-wage basis; such wages support is not considered to be a graduate-assistant appointment, but rather a student-worker position. The student must be registered during the semester in which wages are received. Additionally, in order to receive student-worker support during the summer, a student must be registered for the subsequent fall semester, unless the student is graduating that summer semester.

An international student must have a current I-9 on file with the university to be employed in any status. The university will immediately terminate a student's employment upon the expiration date of his or her I-9, unless a new I-9 has been completed.

1.14 Unclassified Graduate Students

Course Enrollment: Graduate students who have been admitted to the university in unclassified status may enroll in graduate-level courses offered by the Department of Electrical and Computer Engineering providing that they possess the requisite academic and technical background as well as satisfy any prerequisite conditions for the courses in question. To enroll in a course, the unclassified student must first contact the instructor of the course to seek approval for the enrollment. The instructor will verify that the unclassified student has background and prerequisites sufficient for enrollment; the instructor may request that the unclassified student

provide transcripts or other documentation to establish sufficient background and prerequisites. The instructor must email his or her approval for the enrollment to the Graduate Program Director who will then issue the “major override” necessary for enrollment. It is the unclassified student’s responsibility to seek a Registration Access Code (RAC) from the Office of the Graduate School and to enroll in the course after the major override has been issued.

Transfer to a Degree Program: A graduate student holding unclassified status may apply for admission into a degree program offered by the Department of Electrical and Computer Engineering after completing 9 hours of graduate-level courses in unclassified status. All 9 hours must be courses in the Department of Electrical and Computer Engineering. All the usual admission criteria apply (see the specific degree programs to follow for details); additionally, the GPA over the 9 hours of courses taken in unclassified status must be at least 3.0 for admission into a Master of Science program or at least 3.5 for admission into a Doctor of Philosophy program.

2. Master of Science in Electrical and Computer Engineering _____

2.1 Admission Criteria

In addition to meeting the requirements set forth by the Graduate School for graduate admission to the university, admission to the Master of Science in Electrical and Computer Engineering program requires all of the following:

- a GPA of 3.00/4.00 on a B.S. degree
- a TOEFL score of 79 iBT, 213 CBT, or 550 PBT or a IELTS score of 6.5 for the student whose native language is not English unless he or she has earned a degree from a U.S. institution
- satisfactory performance on the GRE for students with an undergraduate degree from a program that is not EAC/ABET accredited

The university allows students who do not meet the GPA requirement for regular admission to be admitted into a program provisionally. However, the Department of Electrical and Computer Engineering does not typically offer provisional admission. In the unlikely event that provisional admission is granted, the student is required to achieve a GPA of 3.00 on the first 9 credit hours of graduate courses (transfer credits and unclassified graduate credits may not be used). If a GPA of 3.00 is not achieved, the student will be terminated from the graduate program. Furthermore, a student who is admitted provisionally is not eligible for financial support (TA, RA, fellowships, wages, etc.).

2.2 Course Requirements

Thesis Option: 30 credit hours beyond the B.S. degree

- 24 credit hours course work (8 courses)
- 6 credit hours of ECE 8000 Research/Thesis

Non-Thesis Option: 33 credit hours beyond the B.S. degree

- 33 credit hours of course work (11 courses)

General Requirements:

- at least half of the courses must be at the 8xxx level
- up to 6 credit hours of ECE 7000 Directed Individual Study; these will be counted as 8xxx-level courses
- up to 9 credit hours from outside the department is permitted; out-of-department hours must be approved by the department

Minor Area: Students can optionally designate an area outside the department as a minor. A minor requires at least 9 credit hours; additional requirements as specified by the specific minor area may apply. Note that a faculty member from the minor area will serve on the student's graduate committee if a minor area is chosen.

In general, courses to be applied to a student's graduate program and to count toward a student's degree must be approved by the student's graduate committee. Among courses outside the department that will not count toward a graduate degree program are:

- MA/ST 6523 Introduction to Probability
- MA 6533 Introductory Probability and Random Processes
- ST 8114 Statistical Methods
- CSE 6753 Computation Fundamentals.

Inquire to the graduate program director about other courses prior to enrollment.

2.3 Examinations

2.3.1 Comprehensive Examination (Non-Thesis Option)

A student pursuing the non-thesis option is required to pass an oral, comprehensive examination consisting of all the graduate-level courses taken toward the degree. To be eligible to take the oral comprehensive examination, a student must have a GPA of 3.0 and be within 6 credit hours of completing the course work on the student's program of study. The student must be enrolled during the semester that the oral comprehensive examination is administered.

The oral comprehensive examination is scheduled by the student's major professor and must be attended by all graduate-committee members. The procedure for the oral comprehensive examination is as follows:

- The student's graduate committee draws up a list of 6 topics covering the student's coursework. The major professor collects the topics from the committee members, assembles the list of topics, and provides the list of topics to the student no later than two weeks before the scheduled oral comprehensive examination.
- At the oral comprehensive examination, the committee selects 3 topics from the previously provided list of 6. The student is asked questions on these 3 topics by the committee, and the student orally responds to the questions.
- The committee evaluates the student's responses by completing the *Department of Electrical and Computer Engineering Masters Non-Thesis Oral Comprehensive Examination Evaluation Form*.
- The major professor submits the completed *Department of Electrical and Computer Engineering Masters Non-Thesis Oral Comprehensive Examination Evaluation Form* along with the *Report of Examination Results* form to the graduate program director at the completion of the oral comprehensive examination. The *Report of Examination Results* form must be submitted directly to the graduate program director by the major professor; students are not permitted under any circumstances to handle *Report of Examination Results* forms.

If a student fails the oral comprehensive examination, he or she will not be allowed to repeat the examination for 4 months, subject to the committee's approval. A second failure terminates the student from the program.

The student must submit the *Department of Electrical and Computer Engineering Graduation Form* to the graduate program director on the day of the oral comprehensive examination. Additionally, the student must complete the Bagley College of Engineering Graduate Exit Survey at http://www.bagley.msstate.edu/surveys/grad_exit.

The Department of Electrical and Computer Engineering does not accept the university's *Pre-Audit Form for Graduation: Master's Degree Thesis/Non-Thesis*; this form should not be completed by ECE students.

2.3.2 Thesis Defense (Thesis Option)

For the thesis option, a student is required to orally defend his or her thesis. The thesis document (finished, not a draft) must be read and approved by the major professor and presented to the remaining committee members one week before the scheduled oral defense.

The student must be enrolled during the semester that the thesis defense takes place. The thesis defense is scheduled by the student's major professor and must be attended by all graduate-committee members. At the thesis defense, the graduate committee signs the *Report of Examination Results* form indicating whether the student has passed or failed. The committee also completes the *Departmental of Electrical and Computer Engineering Thesis and Dissertation Defense Evaluation Form*. The *Report of Examination Results* form and the *Departmental of Electrical and Computer Engineering Thesis and Dissertation Defense Evaluation Form* must be submitted directly to the graduate program director by the major professor. Students are not permitted under any circumstances to handle *Report of Examination Results* forms.

The student must announce the thesis defense one week prior to the defense date by sending an email to all@ece.msstate.edu. The student must submit the *Department of Electrical and Computer Engineering Graduation Form* to the graduate program director one week prior to the scheduled thesis defense.

The Department of Electrical and Computer Engineering does not accept the university's *Pre-Audit Form for Graduation: Master's Degree Thesis/Non-Thesis*; this form should not be completed by ECE students.

If a student fails the thesis defense, he or she will not be allowed to repeat the defense for 4 months, subject to the committee's approval. A second failure terminates the student from the program.

2.4 Thesis Document

A student pursuing a thesis option must write a masters thesis. A thesis is a formal research paper presented by the student to the Graduate Faculty at Mississippi State University, who certify that the presented work meets the standard of the academic discipline. The thesis document must be approved by the major professor prior to the thesis defense. The thesis must be approved by the student's graduate committee, the graduate program director, and the Bagley College of Engineering (via signatures on the thesis signature page) prior to initial submission of the thesis document to the Library.

In order to secure the signature of the graduate program director on the thesis signature page, the student must submit the *Department of Electrical and Computer Engineering Graduation Form*. Theses will not be signed if this form is not on file.

The student must complete the Bagley College of Engineering Graduate Exit Survey at http://www.bagley.msstate.edu/surveys/grad_exit. In order to secure the dean's signature on the thesis

signature page, students must complete the exit survey, print, and bring the exit-survey document, along with a copy of the abstract, to Ms. Debbie Stafford in Room 250 McCain. Thesis signature pages will not be signed without the survey document; additionally, all committee members and the graduate program director must sign the thesis signature page before requesting the dean's signature.

It is expected that the work leading to masters thesis constitutes a research contribution of sufficient novelty and significance to warrant submission of at least one article to an archival journal or conference proceedings. It is strongly encouraged that thesis-option students work with their major professor to complete a submission of such a journal or conference article prior to the thesis defense. All publications (published, accepted, submitted, or in preparation) must be documented on both the *Department of Electrical and Computer Engineering Graduation Form* as well as the Bagley College of Engineering Graduate Exit Survey.

2.5 Graduate Committee

The graduate committee consists of:

- major professor
- committee members (2)

It is the responsibility of each graduate student to determine what area will be studied and to select a major professor to further guide them. The major professor must be selected from within the Department of Electrical and Computer Engineering. The student, working with the major professor, is responsible for selecting two other faculty to serve as committee members. Note that a faculty member from the minor area will serve on the student's graduate committee if a minor area is chosen.

All committee members must hold graduate faculty standing. Graduate faculty are listed in the *Graduate School Bulletin* published by the Office of the Graduate School.

The major professor and graduate committee members are to be selected during the first semester of a student's graduate enrollment and must be documented with the submission to the graduate program director of a *Committee Request* form signed by the student and his or her entire graduate committee. Changes to the committee require approval and must be documented with the submission to the graduate program director of a properly signed *Request for Change of Committee Members* form.

2.6 Prerequisite Courses

It is required that all graduate students take the following courses for credit as required remedial undergraduate course work unless their transcript shows equivalent credit. Additional courses may be required.

- ECE 3413 Introduction to Electronic Circuits
- ECE 3424 Intermediate Electronic Circuits
- ECE 3443 Signals and Systems
- ECE 3714 Digital Devices and Laboratory
- ECE 3724 Microprocessors and Laboratory or ECE 4743 Digital System Design

2.7 Transfer Credit

Graduate course credit hours taken elsewhere and passed with a grade of B or higher are transferable upon request and approval by the student's graduate committee. Transfer credit may not constitute more than 9 semester hours of course work. Additionally, transfer credit from one master degree program at MSU toward a second MSU master degree is limited to a maximum of 9 credit hours. All thesis research hours must be taken at MSU.

2.8 Sequential MSECE Timeline

Non-Thesis Option

✓	<i>Task</i>	<i>When</i>
<input type="checkbox"/>	Submit <i>Committee Request</i> form	first semester of enrollment
<input type="checkbox"/>	Submit <i>Graduate Program of Study</i> form	first semester of enrollment
<input type="checkbox"/>	Apply to graduate	Early in semester of graduation (check Graduate Bulletin for exact deadline)
<input type="checkbox"/>	Take oral comprehensive examination	Late in semester of graduation (check Graduate Bulletin for exact deadline)
<input type="checkbox"/>	Major professor submits <i>Report of Examination Results</i> form and <i>Department of Electrical and Computer Engineering Masters Non-Thesis Oral Comprehensive Examination Evaluation Form</i> to graduate program director	Immediately following oral comprehensive examination
<input type="checkbox"/>	Submit the <i>Department of Electrical and Computer Engineering Graduation Form</i> to the graduate program director	Immediately following oral comprehensive examination
<input type="checkbox"/>	Complete Bagley College of Engineering Graduate Exit Survey (online)	Immediately following oral comprehensive examination

Thesis Option

✓	<i>Task</i>	<i>When</i>
<input type="checkbox"/>	Submit <i>Committee Request</i> form	first semester of enrollment
<input type="checkbox"/>	Submit <i>Graduate Program of Study</i> form	first semester of enrollment
<input type="checkbox"/>	Apply to graduate	Early in semester of graduation (check Graduate Bulletin for exact deadline)
<input type="checkbox"/>	Thesis read and approved by major professor	One week before thesis defense
<input type="checkbox"/>	Submit finished thesis to graduate committee and graduate program director	One week before thesis defense
<input type="checkbox"/>	Announce thesis defense to all@ece.msstate.edu	One week before thesis defense
<input type="checkbox"/>	Submit the <i>Department of Electrical and Computer Engineering Graduation Form</i> to the graduate pro- gram director	One week before thesis defense
<input type="checkbox"/>	Thesis defense	Check Graduate Bulletin for exact deadline
<input type="checkbox"/>	Major professor submits <i>Report of Examination Re- sults</i> form and <i>Department of Electrical and Com- puter Engineering Thesis and Dissertation Defense Evaluation Form</i> to graduate program director	Immediately following thesis defense
<input type="checkbox"/>	Complete Bagley College of Engineering Graduate Exit Survey (online)	Immediately following thesis defense
<input type="checkbox"/>	Collect signatures on thesis signature page	Prior to first submission of thesis to MSU Library
<input type="checkbox"/>	Submit thesis to MSU Library	Late in semester of graduation (check Graduate Bulletin for exact deadline)

3. Doctor of Philosophy in Electrical and Computer Engineering

3.1 Admission Criteria

Admission from the Masters Degree: In addition to meeting the requirements set forth by the Graduate School for graduate admission to the university, admission to the Doctor of Philosophy in Electrical and Computer Engineering program requires all of the following:

- a GPA of 3.50/4.00 on an M.S. degree
- a TOEFL score of 79 iBT, 213 CBT, or 550 PBT or a IELTS score of 6.5 for the student whose native language is not English unless he or she has earned a degree from a U.S. institution
- satisfactory performance on the GRE for students with an undergraduate degree from a program that is not EAC/ABET accredited

Direct Admission from the Bachelors Degree: Highly-qualified undergraduate students may be directly admitted to the doctoral program. In addition to meeting the requirements set forth by the Graduate School for graduate admission to the university, direct admission to the Doctor of Philosophy in Electrical and Computer Engineering program requires all of the following:

- a minimum undergraduate equivalent GPA of 3.50/4.00 on the last 60 credit hours of undergraduate courses, or a first class with distinction degree classification for students whose degrees are from institutions where no GPA is reported
- a TOEFL score of 79 iBT, 213 CBT, or 550 PBT or a IELTS score of 6.5 for the student whose native language is not English unless he or she has earned a degree from a U.S. institution
- satisfactory performance on the GRE for students with an undergraduate degree from a program that is not EAC/ABET accredited

Transfer from the Masters Program: Students currently enrolled in the Master of Science in Electrical and Computer Engineering program in the Department of Electrical and Computer Engineering who wish to transfer to the doctoral program prior to completing the requirements for the Master of Science degree must submit a new application. Requirements for admission to the doctoral program are all of the following:

- a minimum undergraduate equivalent GPA of 3.5 on the last 60 hours of undergraduate courses, or a first class with distinction degree classification for students whose degrees are from institutions where no GPA is reported
- a minimum graduate GPA of 3.8 on the first 15 credit hours of graduate courses
- a GRE score of 1200 (verbal + quantitative) and 3.5 (writing) for students who do not have an undergraduate degree from an ABET-accredited university

The university allows students who do not meet the GPA requirement for regular admission to be admitted into a program provisionally. However, the Department of Electrical and Computer Engineering does not typically offer provisional admission. In the unlikely event that provisional admission is granted, the student is required to achieve a GPA of 3.00 on the first 9 credit hours of graduate courses (transfer credits and unclassified graduate credits may not be used). If a GPA of 3.00 is not achieved, the student will be terminated from the graduate program. Furthermore, a student who is admitted provisionally is not eligible for financial support (TA, RA, fellowships, wages, etc.).

3.2 Course Requirements

Admission from the Masters Degree: at least 48 credit hours beyond the M.S. degree (hours may vary based on approval of student's graduate committee)

- at least 24 credit hours of course work (8 courses)
- at least 24 credit hours of ECE 9000 Dissertation/Research

Direct Admission from the Bachelors Degree: at least 66 credit hours beyond the B.S. degree (hours may vary based on approval of student's graduate committee)

- at least 42 credit hours of course work (14 courses)
- at least 24 credit hours of ECE 9000 Dissertation/Research

General Requirements:

- at least half of the courses must be at the 8xxx level
- up to 6 credit hours in ECE 7000 Directed Individual Study; these will be counted as 8xxx-level courses
- up to 12 credit hours from outside the department is permitted; out-of-department hours must be approved by the department

Minor Area: Students can optionally designate an area outside the department as a minor. A minor requires 12 credit hours of which at least 3 hours must be at the 8000-level; additional requirements as specified by the specific minor area may apply. Note that a faculty member from the minor area will serve on the student's graduate committee if a minor area is chosen.

In general, courses to be applied to a student's graduate program and to count toward a student's degree must be approved by the student's graduate committee. Among courses outside the department that will not count toward a graduate degree program are:

- MA/ST 6523 Introduction to Probability
- MA 6533 Introductory Probability and Random Processes
- ST 8114 Statistical Methods
- CSE 6753 Computation Fundamentals.

Inquire to the graduate program director about other courses prior to enrollment.

3.3 Examinations

3.3.1 Qualifying Examination

All students enrolled in the doctoral program in Electrical and Computer Engineering are required to pass a written qualifying examination. The purpose of this qualifying examination is to assess the student's

broad background in ECE and ensure their capabilities for conducting doctoral work. This exam covers undergraduate ECE course work.

Students who are classified as doctoral students must pass the qualifying examination within the first two years of full-time doctoral enrollment. Students enrolled in the doctoral program part-time have two years to pass the qualifying examination after completing 9 credit hours of course work.

The qualifying examination is given twice a year, each fall and spring semester, usually the first Saturday in October and the first Saturday in March, or as scheduled by the department. Students planning to take the qualifying examination must submit to the graduate program director a *Qualifying Exam Form* by September 15 for the fall semester and by February 15 for the spring semester.

In addition to students enrolled in the doctoral program, the following students may also take the qualifying examination:

- students enrolled in the M.S. program within the department
- senior undergraduate students with a GPA of 3.5 or higher enrolled in the department

Refer to the departmental website for information on the course coverage of the qualifying examination as well as sample tests.

3.3.2 Oral Preliminary Examination (Dissertation-Proposal Defense)

The purpose of the oral preliminary examination (dissertation-proposal defense) is to determine the student's ability to develop scholarly research. The oral preliminary examination may be taken only after the student has passed the qualifying examination; in addition, the student must have completed or be within 6 hours of completing the course work. The oral preliminary exam consists of a presentation of current research activities toward the student's dissertation, including

- the identification of a specific research topic
- literature review
- proposed method
- preliminary results

The student's graduate committee may also ask questions related to course work pertaining to the student's dissertation proposal. Passing the oral preliminary examination requires the approval of the dissertation topic by the student's graduate committee.

At least one week prior to the oral preliminary examination, the student must submit to his or her graduate committee and to the graduate program director a written dissertation-proposal document. The dissertation proposal should be approximately 20 pages in length and must include the following:

- background information

- literature review
- motivation
- proposed method
- preliminary results
- complete references

The oral preliminary examination is scheduled by the student's major professor and must be attended by all graduate-committee members. At the oral preliminary examination, the graduate committee signs the *Report of Examination Results* form indicating whether the student has passed or failed (use the "Oral Comprehensive" line); the *Report of Examination Results* form must be submitted directly to the graduate program director by the major professor. Students are not permitted under any circumstances to handle *Report of Examination Results* forms. The graduate committee also completes the *Admission to Candidacy* form at the oral preliminary examination; the major professor submits the *Admission to Candidacy* form to the graduate program director.

If a student fails the oral preliminary examination, he or she will not be allowed to repeat the examination for 4 months, subject to the committee's approval. A second failure terminates the student from the program.

The oral preliminary examination must be taken by July 1 for December graduation, by November 1 for May graduation, and by February 1 for August graduation.

Completion of the *Admission to Candidacy* form—the "Date written preliminary exam passed" entry should be left blank; the "Date oral comprehensive/preliminary exam passed" and "Date of approval of proposed dissertation topic/title" entries should both be the same as the date of the proposal defense.

3.3.3 Dissertation Defense

A doctoral student is required to orally defend his or her dissertation. The dissertation document (finished, not a draft) must be read and approved by the major professor and presented to the remaining committee readers two weeks before the scheduled oral defense.

The student must be enrolled during the semester that the dissertation defense takes place. The dissertation defense is scheduled by the student's major professor and must be attended by all graduate-committee members. At the dissertation defense, the graduate committee signs the *Report of Examination Results* form indicating whether the student has passed or failed. The committee also completes the *Departmental of Electrical and Computer Engineering Thesis and Dissertation Defense Evaluation Form*. The *Report of Examination Results* form and the *Departmental of Electrical and Computer Engineering Thesis and Dissertation Defense Evaluation Form* must be submitted directly to the graduate program director by the major professor. Students are not permitted under any circumstances to handle *Report of Examination Results* forms.

The student must announce the dissertation defense two weeks prior to the defense date by sending an email to all@ece.msstate.edu. The student must submit the *Department of Electrical and Computer Engineering Graduation Form* to the graduate program director two weeks prior to the scheduled dissertation defense.

If a student fails the dissertation defense, he or she will not be allowed to repeat the defense for 4 months, subject to the committee's approval. A second failure terminates the student from the program.

3.4 Dissertation Document

All doctoral students must write a doctoral dissertation. A dissertation is a formal research paper presented by the student to the Graduate Faculty at Mississippi State University, who certify that the presented work meets the standard of the academic discipline. The dissertation document must be approved by the major professor prior to the dissertation defense. The dissertation must be approved by the student's graduate committee, the graduate program director, and the Bagley College of Engineering (via signatures on the dissertation signature page) prior to initial submission of the dissertation document to the Library.

In order to secure the signature of the graduate program director on the dissertation signature page, the student must submit the *Department of Electrical and Computer Engineering Graduation Form*. Dissertations will not be signed if this form is not on file.

The student must complete the Bagley College of Engineering Graduate Exit Survey at http://www.bagley.msstate.edu/surveys/grad_exit. In order to secure the dean's signature on the dissertation signature page, students must complete the exit survey, print, and bring the exit-survey document, along with a copy of the abstract, to Ms. Debbie Stafford in Room 250 McCain. Dissertation signature pages will not be signed without the survey document; additionally, all committee members and the graduate program director must sign the dissertation signature page before requesting the dean's signature.

It is required that the work leading to doctoral dissertation constitute a research contribution of sufficient novelty and significance to warrant submission of at least one article to a peer-reviewed archival journal. Specifically, doctoral students are required to have submitted at least one article to a peer-reviewed journal prior to the dissertation defense; a preprint of this journal submission as well as proof of submission (e.g., a printout of an email from the journal acknowledging receipt of the submission) must be submitted along with the *Department of Electrical and Computer Engineering Graduation Form*. All journal and conference publications (published, accepted, submitted, or in preparation) must be documented on both the *Department of Electrical and Computer Engineering Graduation Form* as well as the Bagley College of Engineering Graduate Exit Survey.

3.5 Graduate Committee

The graduate committee consists of:

- major professor
- minor professor (if applicable)
- committee members (3)

It is the responsibility of each graduate student to determine what area will be studied and to select a major professor to further guide them. The major professor must be selected from within the Department of Electrical and Computer Engineering. The student, working with the major professor, is responsible for selecting three other faculty to serve as committee members. Note that a faculty member from the minor

area will serve on the student's graduate committee if a minor area is chosen. A doctoral committee thus consists of a total of 4 members if no minor is selected, and a total of 5 members if a minor is selected.

All committee members must hold graduate faculty standing. Graduate faculty are listed in the Graduate School Bulletin published by the Office of the Graduate School.

The major professor and graduate committee members are to be selected during the first semester of a student's graduate enrollment and must be documented with the submission to the graduate program director of a *Committee Request* form signed by the student and his or her entire graduate committee. Changes to the committee require approval and must be documented with the submission to the graduate program director of a properly signed *Request for Change of Committee Members* form.

3.6 Prerequisite Courses

It is required that all graduate students take the following courses for credit as required remedial undergraduate course work unless their transcript shows equivalent credit. Additional courses may be required.

- ECE 3413 Introduction to Electronic Circuits
- ECE 3424 Intermediate Electronic Circuits
- ECE 3443 Signals and Systems
- ECE 3714 Digital Devices and Laboratory
- ECE 3724 Microprocessors and Laboratory or ECE 4743 Digital System Design

3.7 Transfer Credit

Graduate course credit hours taken elsewhere and passed with a grade of B or higher are transferable upon request and approval by the department. Transfer credit may not constitute more than one-half of the required course work. All dissertation research hours must be taken at MSU.

3.8 Sequential PhDECE Timeline

✓	Task	When
<input type="checkbox"/>	Submit <i>Committee Request</i> form	first semester of enrollment
<input type="checkbox"/>	Submit <i>Graduate Program of Study</i> form	first semester of enrollment
<input type="checkbox"/>	Pass qualifying examination	within first two years of full-time doctoral enrollment
<input type="checkbox"/>	Submit dissertation-proposal document to graduate committee and to graduate program director	One week before oral preliminary examination
<input type="checkbox"/>	Oral preliminary examination (dissertation-proposal defense)	Within 6 hours of completing coursework
<input type="checkbox"/>	Major professor submits <i>Report of Examination Results</i> form and <i>Admission to Candidacy</i> form to graduate program director	Immediately following oral preliminary examination
<input type="checkbox"/>	Apply to graduate	Early in semester of graduation (check Graduate Bulletin for exact deadline)
<input type="checkbox"/>	Dissertation read and approved by major professor	Two weeks before dissertation defense
<input type="checkbox"/>	Submit finished dissertation to graduate committee and graduate program director	Two weeks before dissertation defense
<input type="checkbox"/>	Announce dissertation defense to all@ece.msstate.edu	Two weeks before dissertation defense
<input type="checkbox"/>	Submit the <i>Department of Electrical and Computer Engineering Graduation Form</i> to the graduate program director	Two weeks before dissertation defense
<input type="checkbox"/>	Dissertation defense	Check Graduate Bulletin for exact deadline
<input type="checkbox"/>	Major professor submits <i>Report of Examination Results</i> form and <i>Department of Electrical and Computer Engineering Thesis and Dissertation Defense Evaluation Form</i> to graduate program director	Immediately following dissertation defense
<input type="checkbox"/>	Complete Bagley College of Engineering Graduate Exit Survey (online)	Immediately following dissertation defense
<input type="checkbox"/>	Collect signatures on dissertation signature page	Prior to first submission of dissertation to MSU Library
<input type="checkbox"/>	Submit dissertation to MSU Library	Late in semester of graduation (check Graduate Bulletin for exact deadline)

4. Distance Education

4.1 Overview

The Department of Electrical and Computer Engineering offers Master of Science and Doctor of Philosophy degrees in Electrical and Computer Engineering. In essence, the distance degrees are operated identically to their on-campus counterparts; distance students simply participate in the distance-campus sections of the classes they are taking. In particular, the admission requirements and the degree requirements are the same as detailed elsewhere in this document.

Courses use a variety of technologies to deliver course content to distance students, including websites, streaming video, and interactive video conferencing. Department-approved proctors may be required to administer examinations to distance students; such examinations include course exams as well as others such as the doctoral qualifying examination. Oral examinations (e.g., oral preliminary examination, thesis/dissertation defense) may be conducted via on-campus visit by the student, interactive video conferencing, or some method subject to the approval of the student's graduate committee and the graduate program director.

4.2 Courses Offered by Distance Education

As of August 2012, the following courses have been approved by the university for distance-education offering:

- ECE 6243 Physical Electronics
- ECE 6263 Intro VLSI Design
- ECE 6273 Microelec Device Design
- ECE 6313 Antennas
- ECE 6323 Electromagnetic Compatibility
- ECE 6333 RF and Microwave Engineering
- ECE 6413 Digital Signal Processing
- ECE 6643 Pwr Sy Relay Control
- ECE 6653 Power Electronics
- ECE 6713 Computer Architecture
- ECE 6743 Digital Sys Design
- ECE 6813 Communications Theory
- ECE 6833 Data Comm Networks
- ECE 6853 Electro-Optics
- ECE 6990 Special Topic in ECE

- ECE 7000 Directed Individual Study
- ECE 8000 Research/Thesis
- ECE 8053 Intro to Compu Arith
- ECE 8223 Analog Ic Design
- ECE 8273 VLSI Systems I
- ECE 8413 Dig Spectral Analysis
- ECE 8423 Adaptive Signal Processing
- ECE 8433 Statistical Signal Processing
- ECE 8443 Pattern Recognition
- ECE 8453 Introduction to Wavelets
- ECE 8463 Fund of Speech Recognition
- ECE 8473 Digital Image Processing
- ECE 8483 Image and Video Coding
- ECE 8493 Introduction to Neural Networks
- ECE 8503 Spacecraft Electrical Systems
- ECE 8673 Computer Meth Power
- ECE 8803 Random Signals & Systems
- ECE 8813 Information Theory
- ECE 8923 Non-Linear Controls
- ECE 8943 Optimal Control of Dynamic Systems
- ECE 8990 Special Topics
- ECE 9000 Research/Diss

4.3 Distance-Education Proctors

It is up to the instructor of the course to determine the modality for the exams for distance students. Often, the instructor will require the distance students to secure a proctor for the exams.

In such cases that a proctor is required, it is the distance student's responsibility to find a proctor that is suitable to the instructor, and it is the instructor's responsibility to request whatever information is needed to ascertain that the proctor will uphold the academic-integrity standards of the course and the university. In short, the student needs to find someone with whom the instructor will be comfortable having serve as proctor.

Once the instructor and the student agree on the proctor, this agreement needs to be documented with the *Department of Electrical and Computer Engineering Distance-Education Proctor Approval Form*. This form must be returned to the graduate program director before the proctor can serve. Completion of the form will require a curriculum vita for the proctor; the course instructor or graduate program director may request additional information prior to approving the proctor. A separate form must be completed for each class taken with a distance-education proctor. A separate form is also necessary for taking the doctoral qualifying examination with a proctor.

It is the responsibility of the distance-education student to locate a suitable proctor. Proctors from community-college or university testing centers and libraries are preferred. If one of these is not a viable option, other individuals to consider are:

- Public or private community-college or university faculty or staff within an academic department, distance- learning or independent-study office, or counseling or advising center; dean; registrar; official testing center; library; or HRM office
- Public or private K-12 principal or headmaster, vice-principal, guidance counselor, librarian, faculty or school superintendent
- Certified city or county librarian
- United States Armed Forces Education Officer
- Organizational supervisor or HRM officer

The proctor cannot be related to the student in any way. The above list offers suggestions for typically acceptable proctors; final approval of the proctor rests with the course instructor and the graduate program director.

4.4 Distance-Education Research

Students enrolled in graduate programs offered via distance learning and requiring a thesis or dissertation must meet established research requirements which include the completion of ECE 8000 and ECE 9000 hours. Distance students engaged in research will be provided the same student-support services given to on-campus students, including access to Library resources, as well as thesis and dissertation workshops. Distance students may conduct thesis/dissertation research within on-campus research facilities, or, if appropriate, through remote access to on-campus systems. Alternatively, research may be conducted at an off-campus site.

The student's graduate committee must approve the procedures which the student will follow in order to ensure the quality and integrity of the research process at the proposal, data-collection/analysis, and final-defense stages. Should the student request, or be required, to conduct research at an off-campus research facility, the student must complete a *Distance Student Certification of Off-Campus/Non-MSU Research Facility* form. This form must be completed, and all necessary signatures obtained, *before* the distance student begins the research process. Normally, this form must be submitted at the start of the first semester in which the distance student takes ECE 8000 or ECE 9000 hours.