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This handbook complements the [Graduate School Handbook](#) by providing the graduate student in Electrical and Computer Engineering (ECE) with a convenient source of information specific to our program. We strongly urge each student to refer to a current edition of this document when planning his or her program, checking on progress through the degree requirements and deciding what needs to be done next.

The Graduate School Handbook and the ECE handbook together will answer most questions of procedure and policy, and assist the faculty in its responsibilities as the primary student advisory body. Any questions not addressed in one or the other of the two books should be directed to individual advisors or to the Chair of the Graduate Studies Committee.
1. **THE GRADUATE SCHOOL**

The Graduate School is responsible for upholding the academic standards of all graduate programs at Ohio State. To this end, it establishes and enforces certain rules that must be satisfied by all graduate students and the faculty. These rules are set forth in the [Graduate Student Handbook](http://www.gradsch.ohio-state.edu/index.html), which is available on the Graduate School website. It is very important that each graduate student be familiar with the Graduate School’s rules.

2. **THE GRADUATE STUDIES COMMITTEE**

The Electrical and Computer Engineering Graduate Studies Committee forms a liaison between the faculty and graduate students in ECE and the Graduate School. It is responsible for setting and upholding rules specific to this department (and summarized in this handbook) over and above the minimum, general requirements set by the Graduate School in its handbook. The Graduate Studies Committee is composed of ECE faculty members appointed annually by the ECE Department Chair. The Chair of the Graduate Studies Committee represents the committee members to the faculty, the students, and the Graduate School and administers the day-to-day operation of the program. The Graduate Program Coordinator assists the Graduate Studies Chair in most procedural and routine matters and is a valuable source of information on most topics.

There are a number of subcommittees of the Graduate Studies Committee responsible for particular aspects of the graduate program administration and reporting to the Graduate Studies Committee Chair. These include the Graduate Admissions Committee and the Recruitment and Financial Aids Committee. The student typically has little direct interaction with these committees.

2.1 **Getting Help**

The most important resource person available to the graduate student is the faculty advisor. If particularly difficult questions or problems arise that the advisor cannot properly address, the Graduate Studies Committee Chair should be able to address them.

Answers to procedural questions can be found in this handbook. If further clarification is required, the Graduate Program Coordinator is a good resource. The coordinator can be reached by email at ENG ECE Grad <eng-ece-grad@osu.edu>, or during walk-in office hours. For more substantive matters, the Graduate Studies Committee Chair is available by appointment. Email to the Graduate Studies Chair is the most efficient way to schedule an appointment.

Both the Graduate Program Coordinator and the Graduate Studies Chair request that you consult the handbook before scheduling an appointment.
2.2 Communications between the Graduate Program and the Student

Most routine correspondence between the Graduate Studies Committee (via the Graduate Program Coordinator or the Graduate Studies Chair) is handled by email. There are occasions when physical documents must be sent to the student from the graduate program. There are two mechanisms for this: US mail to the student’s local address, and a mailbox for each graduate student located in the ECE main office, 205 Dreese Lab. Students should therefore keep the Graduate Program Coordinator and the University Registrar apprised of their current address at all times, and should check their mailboxes regularly.

3. New Student Course Registration

New students are walked through the registration procedure during their orientation period. After the first semester, registration is online at http://buckeyelink.osu.edu/. Before your registration window opens, you should consult your advisor for approval of the courses you intend to take.
4. Course Registration Issues

There are different course registration requirements for precandidacy MS students and post candidacy students.

Pre-candidacy: MS students and PhD students who have not taken the candidacy exam

☐ Students with GA and Fellowship appointments: If a student holds a GRA, GAA or GTA appointment, GAs should register for at least 9 graduate credits in Autumn and Spring semester, 4 graduate credits in Summer term. Students with Fellowship appointments must register for at least 12 credits in Autumn and Spring semester, and 6 credits in Summer term. If students do not register for the minimum credit requirements established by the Graduate School, the Graduate School will revoke the tuition waiver.

☐ International students NOT holding a GRA or GTA appointment must register for at least 8 credits Autumn and Spring semester (including any required undergraduate hours) to maintain their visa status.

☐ Registration for at least 3 graduate credits during the graduation term is required for all graduate students.

☐ When a doctoral student has earned a master’s degree at this university and has earned graduate credit in excess of the minimum required for that degree, the student submits the Transfer of Excess Master’s Hours to the Doctoral Degree form. This notification must occur no later than the end of the first term of enrollment beyond completion of the master’s degree.

Post Candidacy PhD students

☐ All doctoral students who have passed the Candidacy Examination must register for 3 graduate credits per term. Special permission is required to register for more than 3 credits.

☐ All doctoral students must be enrolled for at least two terms post candidacy.

☐ Continuous Enrollment policy: All students who successfully complete the doctoral candidacy examination are required to be enrolled in every semester (summer session is excluded) until graduation. These students must be enrolled for at least 3 graduate credits per semester. This policy is effective for all students who were admitted to the Graduate School Autumn Quarter 2008 and after (Section VII.8 of the Graduate Handbook).

☐ Completion of Ph.D. degree requirements is required within 5 years after being admitted to candidacy.

Course Registration

Most courses can be scheduled online from the Student Center. For courses requiring instructor permission, the Course Enrollment form must be completed and submitted to the Graduate School. The form can be found online at the Graduate School website. Additional course registration requirements can be found in the Graduate School Handbook.
5. ADVISORS

Each graduate student must have a faculty advisor whose responsibility is to help form an academic program, monitor progress through the agreed-upon program, implement necessary procedures that require signatures at various steps along the way, and guide the thesis (if any) or dissertation research that forms part of the student’s course of study.

Faculty members within ECE and outside of ECE can hold graduate faculty status within ECE. These graduate faculty members are either Category M or Category P. Category P faculty members can advise Ph.D. and M.S. students and serve on all student committees within the department. Category M faculty members can advise M.S. students and serve on M.S. exam committees. In addition, M status faculty members can serve on the committee for Ph.D. candidacy and final exams with the approval of the Graduate Studies Chair.

Currently, all tenure-track faculty members within ECE hold Category P. There are also a few emeritus faculty members within ECE and faculty members from other departments with P status in our department. There are a number of non-ECE faculty with M status as well.

If a new graduate student has accepted a GRA offer, the advisor is the faculty member who offered the GRA. A self-funded new graduate student is usually assigned a temporary advisor for the first semester. If this relationship is satisfactory to both the student and the advisor, the relationship becomes permanent. However another faculty member may be a more appropriate advisor. In that case, after discussing the change with both the current and new advisors, the student should use the Change of Advisor form, have both advisors sign it, and submit the form to the Graduate Program Coordinator, who will record the change.

For BS/MS students, the students should fill out a change of advisor form to switch from their undergraduate advisor to a faculty advisor once they have finished the BS degree.
The M.S. degree is offered in Electrical and Computer Engineering with two options: research track (thesis) and project track (non-thesis). A minimum of 30 Graduate credit hours is required to earn a master’s degree. A student must be registered for at least three (3) graduate credit hours the semester in which graduation is expected. Students also must submit an advisor-approved MS plan of study to the ECE program coordinator by the end of their first semester.

The Project Path (non-thesis) option requires at least 30 hours of graduate credit with an average grade point average of 3.0 or better. Requirements include at least 30 credits and of these 30 credits:

- At least 24 credits must be letter-graded (no S/U), of which
  - At least 15 credits must be ECE courses, one of which is ECE 6070 (Project Management)
  - At least 6 credits must be ECE 6000 level and above completed at OSU. ECE 6070 (Project Management) does not count as an advanced requirement.
  - A maximum of 6 credits of Individual Studies credit (ECE 6193) is permitted.
  - A maximum of 9 credits are allowed in a related field such as engineering, biological sciences, physics, math, chemistry, business, economics and ACCAD.

* Submit an advisor-approved MS plan of study to the ECE Program Coordinator by the end of the first semester.
The non-thesis option also requires satisfactory performance on the M.S. Non-thesis exam, which consists of a take home written exam (structured technical report) followed by a discussion review.

**Important: Note that before starting their projects, students must submit a one-page project proposal to their advisor for approval.**

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**Summary Requirements for the Thesis Option**

The thesis option requires at least 30 hours of graduate credit with an average grade of 3.0 or better.

Requirements include:

1. A satisfactory thesis represented by at least 10 credits of ECE 6999 thesis research credits.

2. At least 20 credits exclusive of thesis research credits (ECE 6999). Of these 20 credits:

   - At least 18 credits must be letter-graded (no S/U), of which
     - At least 9 credits must be ECE courses
     - At least 6 credits must be ECE 6000 level and above completed at OSU.
     - A maximum of 9 credits in a related field (engineering, biological sciences, physics, math, chemistry, business, economics, ACCAD)
     - A maximum of 2 credits of individual studies (ECE 6193)

The thesis option also requires satisfactory performance on a final oral examination (Master’s Examination) with emphasis on the thesis research. The thesis approval and the oral examination
are conducted by the student’s M.S. committee, consisting of the faculty advisor and at least one other faculty member.

**Additional information**

**Time Limit**

Both the thesis and nonthesis M.S. programs have a six (6) year time limit for completion.

**Satisfactory Performance**

The minimum grade point average required by the Graduate School and the ECE department is 3.0 GPA.

**Requirement of Advanced ECE Courses for M.S. Degree**

6 credits of letter-graded advanced ECE courses are required for the M.S. degree. Advanced courses in semesters are defined as ECE 6000 level and above.

**Transfer Credit**

Not more than 6 credits may be transferred from another institution.

**Dual degree master’s program**

Graduate students in Electrical and Computer Engineering may wish to pursue a dual M.S. degree in conjunction with another department. The Graduate School provides a mechanism for such a plan of study, The Dual Degree Program Plan. [http://www.gradsch.ohio-state.edu/forms-library.html](http://www.gradsch.ohio-state.edu/forms-library.html)

The requirements established by the Electrical and Computer Engineering Department in addition to those of the Graduate School are as follows:

1. Two advisors, one from each department, must assist in the formulation and approval of the student’s dual degree plan, and the student-prepared dual degree proposal. At the time the plan is submitted for approval, no more than 50 percent of the total graduate hours included in the plan for either degree may have been completed.

2. If the two degrees are to be taken with thesis, a single thesis will suffice, but its topic must be interdisciplinary in nature and must have the approval and require the expertise of both advisors. In the Non-thesis option, the ECE Non-thesis M.S. Exam must be passed. The dual degree cannot be taken with thesis in one program and without thesis in the other; that would not constitute an integrated program.

3. Two faculty members, one from each program, are required for the exam committee.
At least 20 hours of credit toward the dual degree must be exclusive to the ECE degree. This number must include at least 12 hours of letter-graded ECE courses. At least 6 of these 12 hours must be advanced ECE courses.

7. The Doctor of Philosophy Program

The PhD degree is offered by the Electrical and Computer Engineering Graduate Program in all areas of specialization. The Graduate School Handbook provides details on the requirements of this degree as set by the Graduate School for all doctoral programs. Here, we will outline the essentials and specific requirements set by the Electrical and Computer Engineering Program.

The ECE department offers two different tracks to pursue a PhD degree
- Direct PhD from BS degree
- PhD after the MS degree

7.1 Acceptance into the Doctoral Program

Students with a BS degree applying for graduate studies in the ECE department will be either admitted to 1) the Master program or 2) the direct PhD program.

Direct PhD from BS:
The students with the most promising dossier will be directly admitted in the PhD program by the admission committee. The direct admission criteria will typically correspond to those expected for the University fellowship.

Transfer from MS program to Direct PhD program:
Students admitted in the MS program in the ECE department can transfer to the direct PhD program during the course of their studies before the completion of their MS exam, if they have the support of their advisor and have demonstrated promising evidences of scholarship. The students seeking this transfer should submit to the Graduate Admission Committee a Statement of Intent with the necessary supporting letters (two letters from ECE faculty including the advisor) and evidences of scholarship such as the publication of a paper in an archival journal. Once these students have been admitted into the Ph.D. program all the course credits they have acquired in the MS program will be counted toward the direct Ph.D. program as long as the students have not taken the final exam for the M.S. program.

PhD from OSU MS:
Students completing the MS degree at OSU and wishing to continue for the PhD degree must have the approval of the Graduate Admissions Committee. The student seeks this approval by submitting (1) the Statement of Intent, (2) Student Advising Report, (3) two letters of support from ECE faculty, one of which should be from someone willing to advise your Ph.D. studies and, if applicable, (4) the MS thesis. In the absence of a thesis, other evidence of independent research ability will be requested. This could be as simple as the endorsement of the intended doctoral advisor based on his or her knowledge of the student.
PhD from non-OSU MS:
Students having completed an MS degree outside OSU need to follow standard admission procedures. Evidence of independent research ability is critical for admission in the Doctoral program.

7.2 Summary Requirements for the PhD Degree

7.3 The Doctor of Philosophy Program

The ECE department offers two different tracks to pursue a Ph.D.

- Direct PhD from BS degree
- PhD after the MS degree

Summary Requirements for the PhD Degree

**PhD after BS (Minimum 80 credits)**

<table>
<thead>
<tr>
<th>Letter-graded graduate courses</th>
<th>Minimum 28 credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual studies</td>
<td>Maximum two (2) credits</td>
</tr>
<tr>
<td>Dissertation</td>
<td>Minimum 50 credits</td>
</tr>
<tr>
<td>ECE Graduate Courses</td>
<td>Minimum 21 credits including:</td>
</tr>
<tr>
<td></td>
<td>Outside primary area</td>
</tr>
<tr>
<td></td>
<td>Six (6) credits</td>
</tr>
<tr>
<td>Graduate courses in a related field</td>
<td>Maximum nine (9) credits</td>
</tr>
</tbody>
</table>

*Note that up to 24 course credits and up to 24 dissertation credits (maximum of 48 semester credits) can be transferred from another institution, subject to approval of the Graduate Studies Committee.*

ECE 8891 Seminar (2 credits) required in addition to the 80 credits.

Direct PhD from BS requirements

1. Course requirements include:

- At least 30 graduate credit hours of coursework beyond the bachelor’s degree of which at least 21 credits must be ECE courses and up to 9 credits can be graduate courses in a related field.
- Of the 21 ECE graded course credits, 6 must be associated with an area of concentration outside the student’s primary area of study (does not have to match the traditional curriculum areas in department).
• Of the 30 credits of coursework, at least 28 must be letter-graded courses and 2 can be individual studies.
• Up to 24 coursework credits and up to 24 dissertation credits (for a maximum total of 48 credits) from another institution can be transferred into the direct Ph.D. program, subject to the approval of the Graduate Studies Committee.

2. A dissertation embodying a significant original research contribution and counting 50 hours (ECE 8999) toward the 80 hour requirement.

**PhD after MS requirements**

<table>
<thead>
<tr>
<th><strong>PhD after MS (Minimum 80 credits)</strong>*</th>
<th>Total Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dissertation</strong></td>
<td>36 Credits</td>
</tr>
<tr>
<td><strong>Letter-graded Graduate Courses</strong></td>
<td>12 credits minimum**</td>
</tr>
<tr>
<td><strong>Individual Studies</strong></td>
<td>Maximum 2 credits</td>
</tr>
<tr>
<td><strong>MS Degree</strong></td>
<td>30 credits</td>
</tr>
</tbody>
</table>

* Note that up to 9 course credits and up to 10 dissertation credits (maximum of 19 semester credits) can be transferred from another institution past the M.S., subject to approval of the Graduate Studies Committee.

ECE 8891 Seminar (2 credits) required in addition to the 80 hours.

**ECE Graduate Courses**

Students are required to take a minimum of 21 credits of ECE letter-graded graduate courses. These 21 credits can come from either the MS or PhD program. Six of the 21 ECE credits are from outside primary research area.

1. MS degree counts for 30 credits.

2. In addition to the MS degree, 14 credits of graduate coursework of which 12 must be letter-graded coursework and 2 credits can be individual studies are required. Up to 9 coursework credits and up to 10 dissertation credits (for a maximum total of 19 credits) from another institution can be transferred past the M.S., subject to the approval of the Graduate Studies Committee.

3. A dissertation embodying a significant original research contribution and counting 36 hours (ECE 8999) toward the 80 hour degree is required.

4. The student must have taken at least 21 semester credits of letter graded ECE courses. These 21 credits can come from either the MS or PhD program. The ECE courses from a non-Ohio State MS program must be approved by the Graduate Studies Chair as being equivalent to ECE courses at OSU. 6 of the 21 ECE credits must be associated with an area of concentration outside the student’s primary area of study (does not have to match the traditional curriculum areas in department).
5. Graduate courses taken at OSU in excess of the minimum required for the M.S. degree, can be counted toward the graduate credit hours required for the doctoral degree. The student must submit the form for approval by the ECE Graduate Studies Chair and the Graduate School.

**Summary of Additional Requirements and Steps in the Ph.D. Program**

(Both Direct and from Ms.)

1. The PhD plan of Study must be submitted by the end of the second semester.

2. PhD students are expected to maintain a minimum GPA of 3.5.

3. PhD students must have a permanent advisor by the end of the second semester.

4. The PhD qualifying examination must be taken in the first semester of the second year of study. Two attempts are allowed.

5. Graduate seminar (ECE 8891) of at least two credit hours is required. Credit for these seminars is in addition to the 80 hour degree requirement.

6. The Ph.D. proposal is submitted at the time of the candidacy examination. Two attempts are allowed.

7. Submission of at least one substantial, original paper based on the dissertation research is required.

8. Successful completion of the dissertation (Ph.D. thesis) and final oral examination complete the degree requirements.

**Ph.D. Plan of Study**

The Ph.D. Plan of Study will define an ECE primary area of emphasis, an ECE secondary area of emphasis and other graduate courses approved by the advisor. If you have an M.S. degree from another institution, a transcript must accompany the Plan of Study form. Two faculty signatures are required on the plan prior to submission: the advisor and a secondary area faculty.

The secondary area faculty signing the plan is also agreeing to serve as the secondary area examiner on the student’s candidacy exam committee, and should be from outside the student’s primary area.

**Ph.D. Qualifying Examination**

The Ph.D. qualifying examination (QE) serves as one of the key filters in allowing a student to pass from simple admission to the Ph.D. program to regular doctoral student status. The QE is designed in accordance with the following principles:
The purpose of the qualifying exam is to test the fundamental knowledge acquired by the student over prior coursework and assess the ability to apply this fundamental knowledge to approach research questions/problems.

Both M.S. to PhD and B.S. to PhD students are required to take the QE in the first semester of their second year. (Students who start in autumn semester take it during the following autumn semester. Those who start in spring take it during the following spring semester, and those who start in summer take it during the autumn semester of the next year.)

The QE must be taken during a one month window in autumn and spring semesters. The window will be the month of October for autumn semester and the month of March for spring semester. Two attempts are allowed. The second attempt must be during the time window in the semester following the semester of the failed attempt. If a student fails after two attempts, he/she is no longer in the Ph.D. program and can earn an M.S. degree after completing M.S. requirements. If the student does not take the QE during the semester he/she is required to take it, this will be considered a failed attempt.

**Other Requirements**

In addition to the qualifying exam, the doctoral student must have a minimum 3.5 GPA and obtain a commitment from a faculty advisor on the Ph.D. Plan of Study.

**Submission of a paper based on the dissertation research**

Submission of at least one substantial, original paper based on the dissertation research to a refereed, archival journal is required before approval of the final defense of the dissertation is granted. A signed form from the advisor (form is online) stating the status of the paper along with a copy of the paper must be provided with the Application to Graduate at the beginning of the semester of graduation. If the paper has not yet been published, the student must provide a copy of the email acknowledging the acceptance or submission of the paper to the journal. Typically, advisors expect two or more journal papers from their Ph.D. students.

### 7.4 Ph.D. Qualifying Exam

**Format:**

- The exam will be 90 mins long. The student will be asked to give a short presentation (10 mins) on a research problem chosen by the advisor and the student. The presentation will be "uninterrupted" to assess its clarity, coherence and depth without external input. This will be followed by 20 mins of questioning by each member, followed by a second round of final questions. These questions will be on fundamentals testing the student's ability to integrate the material learned in the courses they took and ability to apply their knowledge to solve research problems and need not be tied to the presentation.
- The Committee will consist of 3 P-status ECE faculty. Two of the members can be selected by the student, the 3rd member will be assigned by the GSC and will be outside the student's research area.
Grading of Qualifying Exam:
The grading for the exam will be either a 2 (pass), 1 (marginal), or 0 (fail). In order to pass the qualifying exam, the student must score at least 4 out of 6. After the exam, each member will give a grade out of 2 and send to the Graduate Program Coordinator, who will tally the grades and notify the student about the outcome of the exam. The student and advisor will be informed by the Graduate Studies chair as to whether the student passed or failed. If it is the student’s first try, the student will have one more opportunity to pass the exam. The committee for the second try must remain the same.

Documents required and deadlines:
One month before the start of the qualifying exam, the student should turn in the request for the Qualifying Exam. This form is online.

Other Requirements: The QE is not the sole determinant for acceptance as a Regular doctoral student. To pass from Special to Regular status, the doctoral student must also have a GPA of at least 3.5.

7.5 Candidacy Examination

The Candidacy Examination is intended to establish the student’s preparation and readiness for independent doctoral level research by assessing the following:
• Intellectual independence
• Familiarity with the literature relevant to the research area(s)
• The formulation of a research problem, and a corresponding research plan

Outcome from the Candidacy Examination:
Direct PhD from BS: There are 3 possible results:
1 The student passes and is awarded the M.S. degree automatically.
2 The student fails; however, the student is awarded the M.S. degree
3 The student fails and is not awarded any degree
PhD from MS: There are 2 possible results:
1 The student passes.
2 The student fails.

Timing of Candidacy Exam:
The candidacy exam should be taken no later than the third year.

Candidacy Exam Committee:
The first step is the formation of the candidacy exam committee. This Committee consists of the student’s advisor (who must have graduate faculty P status in ECE) and at least three other faculty members chosen by the student and advisor together, subject to the approval of the Graduate Studies Committee. One of the members should be an ECE faculty member from the student’s secondary area (usually the faculty member who signs the Ph.D. plan of study). There must be at least three faculty members (including the advisor) with P graduate faculty status in ECE. The fourth member can have P or M status. If the student wishes to have two or more committee members with non-P status within ECE, they must obtain
permission from the Graduate Studies chair and also increase the committee size to satisfy the requirement of three P status committee members.

Research Proposal:
Simultaneously with the formation of the committee, the student should be working on a research proposal. The substance of this proposal forms a major part of the oral portion of the exam. As such, it must be a complete document with a thoughtful, in-depth treatment of the dissertation topic. It should be substantial enough to form the basis of a meaningful oral examination, establishing a worthy research problem and developing an effective research plan. It should only be written after the student has done enough work on the problem to speak meaningfully about it, including discussing her or his preliminary investigations. Above all, it should be a technically sound and scholarly document, not to exceed 15 pages (single spaced, 11 pt. or larger fonts), excluding title page, abstract, table of contents, references cited and appendices.

The proposal should include:
1. Cover sheet including title, one page abstract and table of contents.
3. A history of the problem and previous relevant research.
4. A summary of the student’s own preliminary work on the problem and results to date (details of the preliminary results can be placed in appendices).
5. A research plan leading from the current status toward a clearly defined goal or goals. Listing multiple methods of attacking the problem, or other options, by priority is strongly advised. The research plan should typically be about 5 of the 15 pages.
6. Anticipated results (the goals, as well as acceptable results perhaps a bit short of the ultimate goals) should be discussed along with the contributions these results are expected to make to our understanding of the problem domain.
7. References should be listed in IEEE Transactions format.

The research proposal must be submitted to the Graduate Studies Chair along with the request for approval of a Candidacy Examination Committee (form is online). The signatures of three members of the Candidacy Exam Committee approving the proposal (for examination purposes) should be affixed to the cover sheet of the proposal. The approval form for the proposal can be obtained from the graduate counselor. Once the proposal and committee composition is approved by the graduate studies committee, the candidacy exam officially begins. To check to see if you are approved to start the candidacy exam, you need to check with the Graduate Counselor 1 week after your submission of the approval forms. Because of possible delays, it is suggested that you turn in the forms at least 2 weeks before you plan to start the written portion of the exam.

The written exam:
The Candidacy Examination includes both written and oral parts. The written part of the exam will consist of:
- At least one significant, open-ended problem (to assess intellectual independence)
- A critique, simulation, or analysis of one or two key papers written by non-OSU authors in the student’s area of study (to assess familiarity with the relevant literature)

The written portion of the examination is made up by the entire Candidacy Exam Committee.
The oral exam:
At least two weeks prior to date of the oral exam, the student should turn in the form entitled
Notification of Candidacy Examination to the graduate school. This form can be obtained
online. This form must be signed by the advisor. It also requires the Graduate Studies Chair
signature if non-Category P members are on the committee.

Attendance and Format. Attendance is limited to the student and members of the candidacy
examination committee. Except when video conferencing is involved, all members of the
candidacy examination committee must be present during the entire oral examination. The
oral portion of the candidacy examination lasts approximately two hours. Oral presentation
of any proposal or other prepared materials must be made prior to or
after the oral examination. Questioning of the student should occupy the entire period of the
examination. All committee members are expected to participate fully in the questioning
during the course of the examination and in the discussion of and decision on the result of the
candidacy examination.

The vote must be unanimous in order for the student to pass the exam. Once the Candidacy
Examination Form is completed it should be copied with the copy submitted to the ECE
Graduate Program Office and the original delivered to the Graduate School.

The entire examination, written and oral, must be completed within 13 weeks and the oral
exam must be held within one month of the end of the written portion. Two attempts are
allowed, and the second must be made no sooner than the semester following that in which
the first oral exam was taken.

Should the student change advisors or topics after the Candidacy Exam is passed, he or she
would have to repeat the process. This would not be a formal exam in the eyes of the
Graduate School; it would be an internal matter to the Department.

7.6 Dissertation, Archival Paper Submission, and Final Oral Defense

Research conducted by the student under the PhD program culminates in a dissertation that
must be defended orally before the advisor and two other Dissertation Reading Committee
members (“readers”). Unless there is a compelling reason (such as sabbatical, illness, etc.)
the Dissertation Reading Committee will normally be drawn from the Candidacy Exam
Committee. That is, two of the CE committee members in addition to the advisor will also be
readers of the Dissertation.

When sufficient research has been completed to warrant it, the student must submit a
substantial paper based upon her or his dissertation work to a refereed archival journal. The
paper may be sole-authored, but will usually be coauthored with the advisor. This submission
is required before approval can be given on the Application to Graduate - Doctoral
Program. The intent of this requirement is to give the student experience in reporting on
research at this level in a clear and concise form suitable for publication. It is also expected
that the work is of a quality level and originality suitable for such publication. Typically,
advisors require two or more journal submissions from their PhD students before approving
the Application to Graduate form.
8. Request for Transfer of Graduate Credit

If you have taken courses at the graduate level at another university, some credit may be transferable to your M.S. or Ph.D. program here. Transfer of graduate credit can be considered only if the transcript clearly shows the graduate level courses were taken after completing the B.S. degree.

**M.S. program:** Up to 6 graduate credits may be transferred from another institution into either the M.S. thesis option or the M.S. Nonthesis option, subject to the approval of the graduate studies committee.

**Ph.D after M.S. program:** Up to 9 coursework credits and up to 10 dissertation credits (for a maximum of 19 credits) from another institution can be transferred to the Ph.D after M.S. program, subject to the approval of the Graduate Studies Committee.

**B.S. to Ph.D. program:** Up to 24 coursework credits and up to 24 dissertation credits (for a maximum of 48 credits) from another institution can be transferred into the direct Ph.D. program, subject to the approval of the Graduate Studies Committee.

Residency requirements may limit the number of hours which may be counted toward a graduate degree.

To transfer credit to OSU, submit the [Transfer of Graduate Credit](#) form to the ECE graduate program coordinator for committee approval.

**Special consideration:**

**OSU M.S. students who are accepted to OSU Ph. D. program:** To transfer excess credits beyond the OSU M.S. to the OSU Ph.D. program, submit the [Transfer of Excess Master’s Hours to the Doctoral Degree](#) form to the ECE graduate program coordinator for committee approval.

**OSU B.S. students and Senior Petition:** OSU B.S. students may earn up to 9 credits of graduate credit beyond the B.S. under the following conditions:

- the course is 5000 or above if it is in ECE, or 4000 or above if it is outside of ECE
- a grade of B or higher is achieved
- Submit the [Senior Petition](#) form to the Graduate School by the first Friday of classes.

After these conditions are satisfied, the student submits a letter to the ECE Graduate Studies committee naming the courses and grades achieved.
9. COMBINED BS/MS PROGRAM

Current OSU undergraduate students are eligible to combine BS and MS credits if they have at least a 3.5 cumulative GPA in all previous college work and have completed at least 90 undergraduate semester credit hours.

Students can count up to 9 credit hours in ECE toward the BS and MS as long as the courses are 5000 level or above.

- Students can enroll in the BS/MS combined degree program for up to two terms before graduating with the BS.
- Students will pay the higher graduate student tuition rate in the term(s) they are in the combined degree program. The higher tuition is applied to all credit hours in the term(s).

There are 2 procedures to follow before you begin the combined degree program:

1. Apply to the MS program
   - Apply and accept admission to the MS program before the combined degree program begins.
   - MS admissions and application information can be found on the Application Process page on the ECE website.

2. Complete the Combined Degree Program Approval Form-Applicant
   - Students meet with their undergraduate academic advisor at least 10 weeks before beginning the BS/MS combined program to get approval for courses on the Combined Degree Approval Form-Applicant to ensure that the BS requirements are being met.

To complete the combined program:

- Students meet with their undergraduate academic advisor no later than 10 weeks before graduating with the BS to get approval on the Combined Degree Program Approval Form-Graduating Student. This confirms the courses to be applied to the combined program.

Additional information can be found on the ECE website on the BS/MS program page.
10. ENGLISH LANGUAGE REQUIREMENTS

All International students who are accepted into the University are required to take an English proficiency test administered by the Department of English. English Language requirements for Ohio State University can be found on the English as a Second Language website.

All International students who apply for a Graduate Teaching Associateship must first pass a test of spoken English administered by the Spoken English Department. These tests are scheduled each term. For more information, the student can contact the Spoken English Department 292-5005.

11. FINANCIAL AID

Financial aid in the Department of Electrical and Computer comes in four forms:
- University Fellowships
- Industrial Fellowships
- Graduate Teaching Associateships (GTA)
- Graduate Research Associateships (GRA)

11.1 Types of Appointments

1. University Fellowships are supported by the Graduate School and provide tuition and fee waivers for one year and a monthly stipend which can change annually. Usually this stipend is somewhat lower than the Associateship stipend offered by the ECE Department. Thus the ECE Department typically augments the University Fellowship to a level commensurate with the Departmental Associateships. For this augmentation, the student will be expected to contribute some research time to the Department. Since the typical graduate student is usually eager to become involved in research, this expectation presents no burden.

   The University Fellow must enroll in at least 12 hours of course credits (post candidacy PhD students must be enrolled with 3 credits). University Fellowships cannot be applied for; they are granted to a student based upon his or her academic background and upon the recommendation of the department. A University Fellowship is regarded by the Graduate School and the department as one of the most prestigious awards that can be granted to a graduate student as they progress to a PhD. Accordingly, students holding Fellowships are expected to engage in an active program of research which culminates in significant evidence of scholarship. Evidence of scholarship includes refereed publications, and a PhD dissertation.

2. Industrial Fellowships are awards made with industrial funds to newly arrived students and those who are already progressing through their graduate programs here. They are given with the recommendation of the department and concurrence of the companies involved. Most of these fellowships are intended for students in the PhD program. Stipends vary and tuition and fees are generally waived. Students with this type of appointment must enroll in at least 12 hours of graduate course credits (post candidacy PhD students must be enrolled for 3 credits).

3. Graduate Teaching Associateships (GTA) are awarded as department needs
arise and budgets allow. Teaching Associates usually are responsible for 2 or 3 sections of an introductory laboratory course or serve as an aide to a professor teaching an introductory theory course under a halftime (20 hours/week) appointment. The appointments often extend over the academic year with summer appointments available to a lesser extent. However, it is hoped that the GTA will be successful in obtaining a GRA so the GTA renewal will not normally be necessary.

A number of the available GTA positions are made to new incoming graduate students. The selection is made on the basis of the student’s previous academic record and the area of specialization. The remaining positions are reserved for continuing students and are granted on the basis of academic record and research progress, past teaching performance, and the course/lab positions that need to be filled.

GTA’s must enroll in at least 9 hours of graduate course credits (post candidacy PhD students must be enrolled with 3 credits). All tuition and fees are waived and stipends can change annually. A presently enrolled student who wishes to obtain a GTA appointment may submit an application to the Associate Chair for Curriculum.

4. Graduate Research Associateships (GRA) are awarded to newly arrived and presently enrolled students as needs arise and budgets allow. Research Associates usually are responsible for performing research tasks on a particular budgeted contract or grant secured by an individual faculty or research staff member or laboratory group. The appointment is for halftime (20 hours/week) and the research usually leads to the satisfaction of thesis or dissertation requirements. GRA’s must enroll in at least 9 hours of graduate course credits (post candidacy PhD students must be enrolled with 3 credits). All tuition and fees are waived and stipends can change annually. Since these stipends are paid through individual research contracts and grants, the presently enrolled student who seeks a GRA appointment must contact individual faculty members or research groups in the area of interest and see if needs and funds exist to provide support.

11.2 Stipend Increases

All starting stipends are uniform for the various forms of aid in the ECE Department. Cost-of-living increases are generally given annually. In the PhD program, the Department provides uniform stipend increases corresponding to progression through the academic program, e.g., passing the PhD Qualifying Examination and passing the Candidacy Examination.

In order for a student to qualify for the first incremental stipend the student must satisfy 3 criteria:

1. Be admitted to the Ph.D. program.
2. File a Ph.D. Plan of Study.
3. Pass the Ph.D. Qualifying Exam.

In order for a Ph.D. student to get their second incremental increase, they must have passed their Candidacy Examination. The raise for each increase will become effective on the semester following the completion of these requirements. The deadline for all requirements is the last day of the graduate associate and fellowship appointment date of the Autumn or Summer semester. Department policy requires any graduate student who receives financial aid via fellowships or associateships to refrain from outside employment. It is felt that a commitment to academic studies and research/teaching leaves no time for additional duties which may jeopardize the student’s degree goals.
11.3 Terms of Appointments
Initial offerings of Fellowships, GRA’s, and GTA’s are always made via a formal letter of offer from the department chair and request for acceptance or declination by a stated date. These letters detail the source of funding, the duties involved, the stipend and tuition waiver, and the duration of the appointment. Subsequent appointment offers are usually made with similar letters. However, in the case of GRA’s often less formal offers of continuing support are made to the student by the faculty or laboratory providing the support. Continuing GTA appointments are made by formal letters of offer.
Evaluation of performance of GRA’s is made by the supporting faculty members or laboratory. These are usually informal reviews with oral feedback to the student. A similar evaluation of GTA’s is made by the Associate Chair for Instruction who incorporates into the review rankings and comments made by students in the student evaluation forms.

Should a student be given an unsatisfactory performance evaluation, he or she is made aware of the dissatisfaction. If performance is not improved, termination of the student’s appointment can be made before its original termination date. Graduate student grievances are usually initially brought to the attention of the Graduate Studies Chair who will seek information from both sides of the issue.

Additional benefits, beyond a monthly stipend and tuition waiver, usually do not accompany an appointment as Fellow, GRA, or GTA. In individual cases the department or the supporting faculty may provide conference and travel costs for a student, and a few industrial fellowships allow such expenses. Fellowships and GRA appointments are usually 12 month appointments, with no vacation time between semesters. The student is expected to arrange for time off with his advisor/support faculty and to compensate accordingly. Appointment as a GTA requires the student to be on duty from the first day of class to the day of commencement.
12. EQUIPMENT AND COMPUTING FACILITIES

The Electrical and Computer Department has a variety of computing labs serving the needs of graduate students in their research and academic instruction. Please visit the ECE Computing Resources page on the ECE website for additional information.

OSU’s Office of the Chief Information officer (OCIO) serves as the central computing organization for all students.

The OCIO Helpdesk can be reached by calling 614-688-HELP or by sending email to 8help@osu.edu.

13. MISCELLANEOUS

13.1 Departmental Colloquia and Seminars

During the academic year, the ECE Department and other departments host many colloquia given by visiting scholars from industry and academia as well as by our own faculty and students. Each graduate student is urged to attend as many of these colloquia as possible, certainly in his or her area of interest but also those in other research areas. All such events are posted in advance in our department’s web page and other locations around the department.

13.2 Office Assignments and Keys

The department would like to provide office space for all graduate students. However, in recent years this has been impossible due to the limited space available. The following priority will be used to allocate the available offices:
1. Graduate Teaching Associates,
2. Graduate Research Associates,
3. University, U.S. corporate and government fellowship students,
4. Other graduate students and visiting scholars.

At times it may be necessary to ask students to change offices but every attempt will be made to keep such disruptions to a minimum. Office assignments are handled by Prof. George Valco.

Basement of Caldwell Laboratory ..............................................Error! Bookmark not defined.

Graduate students with offices may obtain keys to their offices. Graduate students without offices may obtain keys to their research laboratory rooms upon the recommendation of their advisor when there is a need. All students use their OSU BuckID cards at the keycard readers to access the building. Keys are obtained by faculty emailing a request to Mr. William Thalgott.

13.3 Change of Address

It is very important that any change of address be reported immediately to the Registrar’s office. As a safety measure, report any change of address to the Graduate Program Coordinators.

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