

**SCHOOL OF ELECTRICAL AND COMPUTER ENGINEERING**

**PH.D. DISSERTATION PROPOSAL**

**PROCEDURES AND GUIDELINES**

**(Last Revised: July 2019)**

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## INTRODUCTION AND PURPOSE

This guide supplements the PhD proposal information in the ECE Graduate Handbook. Students and faculty should refer to the information contained here during the process of completing the proposal portion of the PhD degree requirements. For additional information, clarification or questions, please contact the ECE Graduate Affairs Office.

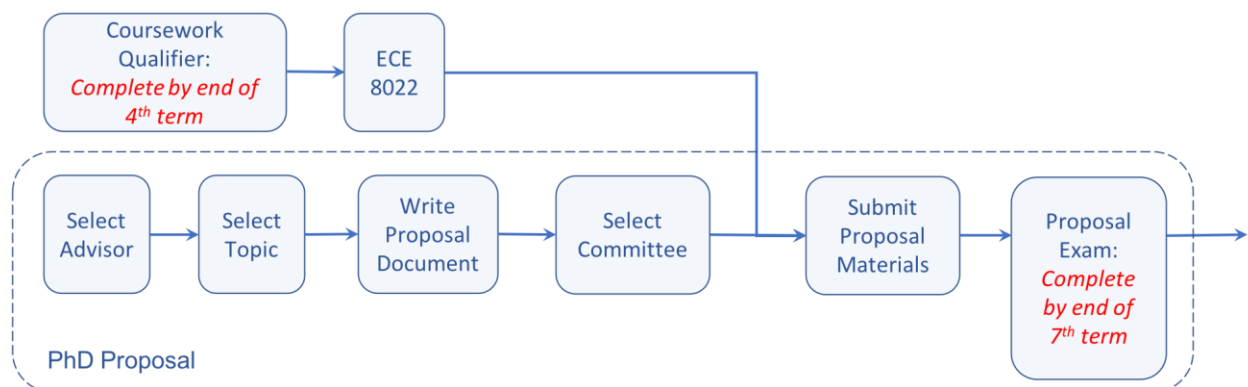
The Georgia Tech policies regarding graduate student research and the appointment of thesis advisory committees can be found at <http://www.policylibrary.gatech.edu/student-affairs/policy-advisement-and-appointment-thesis-advisory-committees>.

As described in the ECE Graduate Handbook, the Dissertation Proposal Exam in the School of Electrical and Computer Engineering serves two functions:

1. The second part of the ECE Comprehensive Exam (the Coursework Qualifier being the first part.)
  - Test whether the student has sufficient background to enter the Ph.D. Program
  - Allow the committee to judge the student's ability to execute a research task and to communicate the results.
2. Evaluation of the Ph.D. Dissertation topic by the Dissertation Reading Committee.
  - Evaluate the proposed topic to ensure that, if completed as posed, it constitutes an original contribution to knowledge.
  - Evaluate the proposed research plan to ensure that it is well-conceived and feasible to complete with the resources available within a reasonable time frame.

## SUMMARY OF THE PROPOSAL PROCESS

The steps involved in the proposal process are summarized in the diagram below:



These steps are outlined in more detail in the following sections. Faculty and PhD students should be familiar with these steps. Details of the procedures involved are described in the remaining pages of the guidebook.

### **Advisor Selection**

- This is a mutually agreed upon relationship in which the student selects the advisor and the advisor agrees to invest the needed time for research and thesis supervision.
- A student who selects an advisor outside of ECE **must** select a co-advisor who is an ECE faculty member. Adjunct faculty can only serve as advisor/co-advisor upon approval from the Associate Chair for Graduate Affairs.
- The selection of the advisor is reported to the ECE Graduate Affairs Office by submitting the online advisor selection form, available at <https://secure2.ece.gatech.edu/PHP/gradforms/login.php>. The Advisor Selection form should be submitted at the earliest date possible, and no later than the end of the second year following matriculation into the ECE PhD program.

### **Dissertation Topic**

- The PhD dissertation topic is developed by the research advisor and the student.
- In addition to guiding the student in research efforts, the advisor may recommend or require coursework in addition to ECE's requirements, review of articles in professional journals, or additional tasks/activities to be completed prior to completing the proposal process.

### **Coursework Completion**

- Although the instructions on the Georgia Tech “Request for Admission to Ph.D. Candidacy” form indicate that the student must complete all course requirements except the minor to qualify for Ph.D. candidacy, ECE does not require that the coursework is completed before the Proposal Examination.
- The electronic coursework plan (<https://secure2.ece.gatech.edu/PHP/gradforms/login.php>) must be submitted and approved by the Graduate Affairs Office at the time of the Proposal Examination, showing completed coursework and a clear plan for the remaining course completion.
- The proposal examination cannot be held if the student has not completed the professional communication seminar, ECE 8022, and did not meet the institute PhD residency requirement (full time enrollment for at least two semesters while classified as PhD student).
- If the coursework was not completed before the proposal examination, the final completed coursework plan must be certified **no later than the end of the semester prior to graduation.** At the time of the final submission, the form has to show completion of **43 hours of classes** to be used toward the PhD coursework requirements. The term and year in which each class was completed as well as the hours completed and

the grade earned for each class must also be indicated on the form. The student is responsible to ensure in a timely manner that they will meet the coursework requirements.

- Students planning to use Special Problems (ECE 8901, 8902 or 8903) towards their PhD coursework requirement must have the special problem work certified by the faculty sponsor **before** the hours can be used. A form for use in certifying special problem hours is available on the ECE website in the Courses and Coursework Planning area (<https://www.ece.gatech.edu/coursework-planning>).

### **Timing of the Proposal Examination**

- The Proposal Examination consists of two parts: evaluation of a proposal document prepared by the student, and an oral examination including an oral presentation of the proposal by the student.
- Students must successfully complete the entire Proposal Examination within 7 terms of their matriculation into graduate studies in ECE at Georgia Tech, not including summers. If this deadline is not met, the student will be required to leave the graduate program. Students may petition the ECE Graduate Committee for an extension. The petition must include information about the research progress that the student has made, and must be supported by the student's advisor.
- The expectations for the Proposal Exam have changed as of Fall 2018. The student is expected to demonstrate background knowledge of their dissertation topic, as well as broader understanding of the discipline. The Proposal must contain a detailed plan for the completion of PhD-level research on the dissertation topic, and preferably some results. However, it is understood that any results will be early and possibly inconclusive; and the dissertation topic, methods, and results may evolve considerably in-between the Proposal and the PhD defense. Students are advised to seek the input of the committee on the research direction, and inform their committee members of significant changes.
- There **must** be a **minimum of six months** between passing the proposal oral exam and scheduling of the dissertation defense.
- Under no circumstances can the proposal and dissertation examinations take place in the same term.

### **Writing the Proposal Document**

- Once the research advisor determines that the student has a thorough understanding of the background knowledge necessary for the agreed-upon research topic and has a well-considered research plan, the student writes a proposal of no more than 35 pages including references and appendices. The proposal should be as concise as possible.
- The proposal must be written in the thesis format. The LaTeX and Word templates can be found online at <http://www.grad.gatech.edu/theses-dissertations-templates>.
- The proposal must contain a chapter or sub-chapter entitled "Literature Survey", appearing anywhere in the document that the student finds appropriate. The "Literature Survey" section is a minimum of five pages and must be written by the student with no

outside help. **A disclaimer statement, signed by both the student and the advisor**, is included in the first section of the proposal to document compliance with this requirement. A copy of the disclaimer statement is included at the end of this document.

- The rest of the proposal document must contain, at minimum: a concise statement of the PhD dissertation topic, a summary of the research completed, an outline of the research to be completed, and a clear summary of the contributions of the research. The student can get help in preparing the rest of the proposal document.

### **Proposal Review Committee**

- When the proposal is ready for submission, the student (under the guidance of the research advisor) prepares the ECE Ph.D. Proposal Committee Form and the Request for Admission to Ph.D. Candidacy form. It is important that the abstract of the candidacy form is well written. The abstract must begin with “The objective of the proposed research is...”. Assistance drafting the abstract is acceptable and encouraged.
- The research advisor and the student select two academic faculty members who will serve on the proposal reading committee and, subject to Institute approval, on the PhD Dissertation Reading Committee.
- At least one of the two reading committee members must be ECE faculty.
- ECE adjunct faculty or faculty from another GT academic unit may serve as reading committee members.
- Additional members can be added to the proposal committee with the approval of the ECE Graduate Affairs Office, obtained at the time of the proposal submission.
- The committee form can be found online at <https://secure2.ece.gatech.edu/PHP/gradforms/login.php>. The approval is electronic.

### **Submission of the Proposal Materials**

- Prior to submission all students need to visit the ECE Graduate Affairs Office for coursework verification and advising on the preparation of the submission materials.
- The submission is now all electronic.
  - **Online:**
    - Electronic committee form submission at <https://secure2.ece.gatech.edu/PHP/gradforms/login.php>.
  - **To the Academic Office:**
    - Electronic (pdf) copy of the proposal document with the scanned disclaimer form inserted before the Table of Contents page (a copy of the disclaimer form is included at the end of this document).
    - Admission to Ph.D. Candidacy form. Only the Name, Title and Brief Description fields have to be filled out. The Brief Description must begin with “The objective of the proposed research is...”.
    - The body of the email must contain a copy of the Brief Description from

the Admission to Ph.D. Candidacy form.

- Links to the Request for Admission to Ph.D. Candidacy and committee forms are in the “Proposal Examination” area of the Ph.D. Degrees link: (<https://www.ece.gatech.edu/phd-degrees>).
- Because the Institute Graduate Studies Office **requires** original signatures, the Request for Admission to Ph.D. Candidacy form is signed (by student, advisor, and reading committee members) **after** the proposal committee determines that the student has successfully completed the proposal process (both written and oral exam portions).

#### **Submission of the Proposal Document to the Review Committee**

- The research advisor cannot serve as chair of the review committee. The chair is designated by the ECE Graduate Affairs Office.
- Immediately after the submission, copies of the proposal (and proposal related documentation) are electronically distributed to committee members and to the student by the ECE Graduate Affairs Office.
- After the documents reach the committee members, the proposal committee chair assumes responsibility for the remaining proposal-related activities. There is a minimum of two weeks required to allow the committee to peruse the materials between submission and scheduling the oral presentation.

#### **Proposal Exam: Evaluation Process**

- It is the proposal review committee's responsibility to evaluate the written proposal and hold an open (public) oral presentation of the proposal followed by a closed question and answer session.
- The **proposal committee chair** finds a date, time and place when the committee can meet for the oral presentation. The committee chair then submits a request to schedule the proposal oral exam, including in the message the student's name, the day, date and time of the exam, and the room and building in which the exam will be held. The submission must be done on the contact page of the ECE Website: <https://www.ece.gatech.edu/contact-graduate-office-current-students>. Students should not submit proposal oral exam scheduling information, this should be handled by the proposal committee chair or the chair's administrative assistant.
- The ECE Graduate Affairs Office posts proposal examination notices after being notified of the exam by the proposal committee chair. At least five business days (Monday through Friday) advance notice of the examination must be given to the Georgia Tech community.
- Following the proposal exam, the committee provides the signed Admission to PhD Candidacy together with the completed individual and full committee evaluations of the proposal to the ECE Graduate Affairs Office. The evaluations are emailed to the student and the ECE assessment staff, then saved in the student file.

### Evaluation of the Proposal

Each member of the proposal review committee will evaluate the written proposal and the oral examination based on the criteria described below:

#### *Student's Preparation*

- the **Student** has acquired the necessary background knowledge in their field to be successful in PhD level research, and demonstrates a command of the specific topic of their research.

#### *Proposal Content*

- the **Topic** of the proposal is clearly formulated, of appropriate scope, and relevant to modern engineering research and practice. If successfully completed, it would represent an original contribution to knowledge.
- the **Survey** of existing work provides sufficient background and context for the proposed research, including an extensive review of the published literature.
- the **Plan** of proposed work is clearly articulated, is realistic in implementation and scope, utilizes best research techniques and practices, and is reasonably likely to yield sufficient information relevant to the topic.

#### *Communication Skills*

- the **English** usage adheres to the rules of standard English, and is understandable to the reader.
- the **Document** is well organized, is thoroughly referenced, and provides useful and clear tables and graphs to support the text.
- the **Presentation** is well organized, of appropriate length, coherent, and convincing.

### Proposal outcomes

- **Pass:** The committee may pass the student but give recommendations for the student's research direction. Students should generally follow this advice, in consultation with their advisors. The proposal committee members will form the Dissertation Reading Committee.
- **Conditional Pass:** If the committee has reservations about the student's performance or the proposed material, they may vote for a conditional pass. A "Conditional Pass" is a pass but certain conditions set forth by the committee **must** be met. A sample of common conditions include:
  - completion of additional courses that the committee feels are important for proper preparation
  - specific steps to take to improve oral presentation skills and/or written communication skills
  - adding an addendum to the proposal
  - redoing the oral presentation (unless the arrangements for a conditional pass specifically require that the oral presentation be repeated, it generally does not need to be done again)
  - additional concerns determined by the committee may also apply and should be



communicated to the student and advisor in writing.

- **Fail:** The committee may also consider the student’s proposal and/or presentation to be of insufficient quality to warrant a pass or conditional pass. If this occurs, the committee specifies to the student (advisor and ECE Graduate Affairs) why the “Fail” decision was reached and may make recommendations on what the student should do; for example, the committee may require further preliminary research until a better definition of a proposed topic is forthcoming.
  - In accordance with Institute requirements, a student may only attempt the proposal exam twice.
  - A student who fails the proposal examination on the first attempt will be expected to consult with the Associate Chair for Graduate Affairs for guidance as to how to proceed. If a student chooses to attempt the proposal exam again, then they would resubmit a proposal document. The committee may or may not be the same.
- **Hung committee:** If the committee is not in agreement at the time of the examination, the Associate Chair for Graduate Affairs will follow up with the committee and negotiate a solution. If the agreement is not reached after mediation, the student will restart the proposal process. The student has two more attempts, and has the option to form a new proposal committee.

### **Reporting Results**

Each member of the proposal committee will complete individual evaluations based on the criteria outlined above. These evaluations will be summarized in the full committee report, which will be prepared by the committee chair following the committee’s deliberations.

- The results of the proposal examination are reported to the ECE Graduate Affairs Office. Originals of the individual committee member evaluation forms and the full committee report are submitted to the ECE Graduate Affairs Office. The Graduate Affairs Office provides copies of the evaluations to the student.
- The signed Admission to Ph.D. Candidacy form is submitted to the ECE Graduate Affairs Office for processing and submission to the Institute Graduate Studies Office so that the Dissertation Reading Committee can be approved.
  - Following a successful proposal examination, the Admission to Ph.D. Candidacy form is signed by the student, advisor and the two reading committee members.
  - Following a Conditional Pass, the Admission to Ph.D. Candidacy form will not be submitted to the Graduate Affairs Office until the student met all the requirements and the “All Conditions Have Been Met” rubric is checked on the Full Committee Report. Only after meeting all the requirements the form is processed and the Admission to Ph.D. Candidacy accepted.
  - Following a Fail, the full committee report and the individual evaluation forms are submitted to the ECE Academic Affairs Office and the proposal process ends. If the student chooses to attempt the proposal again, the process will start at a later time with the submission of a new proposal document.

- If the coursework has not been completed prior to the Proposal, the signed Admission to Ph.D. Candidacy form is not submitted until the student completes all the course requirements. It is the student's responsibility to inform the Academic Office when the coursework has been completed and all grades have been recorded so the Admission to Ph.D. Candidacy form can be released to the office of Graduate Studies.
- **There must be a minimum of six months between the successful completion of the proposal examination and the oral defense of the PhD dissertation.**
- The proposal process is not completed until all the forms have been submitted to the Academic Office. However, the six months count starts at the time when the student met all the requirements and was declared passed by the committee.

## **PREPARING THE PROPOSAL**

The ECE department offers a technical writing class for international Ph.D. students who need to improve their writing skills. The Scientific Writing for International Students class is offered twice a semester during the spring and the fall terms. It is a non-credit course and cannot be found on OSCAR. The Graduate Affairs Office advertises the class every semester and participants are selected on a first-come, first-served basis. For more information, please contact the Graduate Affairs Office.

### **Proposal Format**

The proposal must be written in the Institute Thesis format. Templates can be found at <http://www.grad.gatech.edu/theses-dissertations-templates>.

As described above, the proposal should contain a section entitled "Literature Survey", that the student writes with no outside help. This section has to be at least 5 pages long. This is the only required section in the proposal; however, the following sections are recommended:

#### **Introduction**

This brief paragraph states the objective and/or goals of the PhD research. The information provided in this area gives the reader a quick overview of what is included in the proposal. The Introduction may even be drawn from the brief description of the "Request for Admission to Ph.D. Candidacy" form.

#### **The preliminary research**

A written summary of some or all of the research performed is presented in a coherent manner. This section would include the approach taken and some preliminary results.

#### **The proposed research**

Based on the background information and results presented in the Preliminary Research section,

the Proposed Research section should begin with a clear, concise statement of the topic and the proposed method of attack. This statement will usually begin with "The object of the proposed research is...." This one simple English sentence should state exactly that – the objective of the research. This statement is followed by a few sentences of explanation or amplification, and a description of the method of attack. This information should be in a form suitable for use in the "Request for Admission to Ph.D. Candidacy" form, which is submitted to the Graduate Studies – VPR office after the proposal has been approved by the School.

#### Work remaining to be done

This is an estimate and an outline of the work needed to complete the project, and the time required for completion.

#### Facilities needed

This section should list the major items of equipment and facilities needed, including those already in use. It should be brief, but specific. It is not sufficient to say "The facilities, etc., are available". If supplies, equipment or facilities are needed and not already available in the School, the means for obtaining them should be indicated. Unusual or special items require advanced planning and these are the most important. Computing time requirements should also be given if applicable.

The entire proposal, including figures, tables, references and appendices should not exceed 35 pages.

#### Figures, Tables and References

It is important that figures, tables, and references in the proposal are presented in a manner consistent with professional publication standards.

When placing a figure or table and its identifying description in the proposal, it is important to consider ease of access for the document reader. In most cases the text that introduces a figure or table will precede the placement of the figure or table in the proposal. However, the describing text should be in close proximity to the figure or table so that the reader is not forced to refer back and forth between pages in order to understand the information provided. It may be necessary to place a figure or table before the describing text so that both appear on the same page.

References should be presented in a consistent manner throughout the proposal. It is recommended that references be presented in either consecutive number order or alphabetical by first author of the publication. When using the alphabetical listing, the references in the body of the proposal should give the author's last name and the year of the publication. When there are two authors, both should be listed with the publication year. When there are more than two authors, just the first author's name, the notation "*et al*" referring to the other (unlisted) authors, and the year would be listed. When using consecutive numbers, the list of references is prepared

in numerical order following the first appearance of each reference in the text.

### **Other considerations**

If the thesis research is part of a larger project, its relationship to the larger project should be pointed out. This can be done under “Literature Survey”. **The particular aspect of the problem that represents an original contribution by the student should be made clear.** This will usually be done under the heading "The Proposed Research".

The proposal will not be approved if it is not written in acceptable English. A student who has unusual difficulty in presenting ideas in writing may use the proposal as an exercise in preparation for the dissertation write-up.

### **Preparing the Request for Admission to Ph.D. Candidacy Form**

Careful attention should be given to the preparation of the Request for Admission to Ph.D. Candidacy form, which is submitted with the proposal. This form is included in the permanent Georgia Institute of Technology record for each PhD student. The candidacy form should be prepared with standard grammatical conventions in mind – **including proper capitalization of the title.** Students are encouraged to seek assistance from the research advisor and/or other professionals when preparing the candidacy form.

When preparing the Request for Admission to Ph.D. Candidacy form, it is **important to avoid the use of abbreviations and/or acronyms in the dissertation title.** Abbreviations and/or acronyms considered as professional (or industry-wide) standards are exceptions and may be used.

The dissertation title should clearly communicate that the research will significantly contribute to the current knowledge level of the topic area. The brief description portion of the candidacy form should be a succinct statement describing the object of the research, the planned strategies for research, and the expected results.

**\*\*\*To effectively organize the abstract, the first statement is to begin with “The objective of the proposed research is...”** While a concisely worded abstract is important, it is also necessary to provide a statement that gives the reader a good understanding of the proposed research topic and expected outcomes of the research.

A revised Request for Admission to Ph.D. Candidacy form must be filed if changes in the dissertation title, reading committee or abstract are needed. The revised form should include the items to be changed and must be approved by the advisor and the ECE Graduate Affairs Office.

### **Problems**

Should the student encounter problems along the way, such as interpreting what is contained in

this document, the student is advised to discuss the problems with the Graduate Affairs Office.

## **FREQUENTLY ASKED QUESTIONS**

### **Will you walk me through the proposal process from start to finish?**

1. Student updates **coursework plan** at (<https://secure2.ece.gatech.edu/PHP/gradforms/login.php>) showing all grades earned for the classes already completed and the planned remaining classes. Form needs to be approved by the ECE Graduate Affairs Office.
2. Student visits the Academic Office to express the intent of submitting the proposal, and to get all their questions answered.
3. **Submit** the following to the ECE Graduate Affairs Office:
  - a. **Online:**
    - i. Electronic committee form submission at (<https://secure2.ece.gatech.edu/PHP/gradforms/login.php>).
  - b. **To the Academic Office (email [daniela@ece.gatech.edu](mailto:daniela@ece.gatech.edu)):**
    - i. Electronic (pdf) copy of the proposal document with the scanned disclaimer form inserted before the Table of Contents page (a copy of the disclaimer form is included at the end of this document).
    - ii. Admission to Ph.D. Candidacy form. Only the Name, Title and Brief Description fields have to be filled out. The Brief Description must begin with “The objective of the proposed research is...”.
    - iii. The body of the email must contain a copy of the Brief Description from the Admission to Ph.D. Candidacy form.
4. The Academic Office distributes the proposal materials to the committee members.
5. The Committee Chair coordinates proposal committee activities and seeks input on the proposal.
6. When the committee determines proposal is ready for examination, the chair schedules the exam through the ECE Graduate Affairs Office. The date, time and location of the proposal exam must be announced a minimum of five working days in advance.
7. The process could take as short as 3 weeks but it can take up to 8 weeks or longer especially at busy times of the term or at times when faculty are traveling away from campus.

### **What if I have an additional committee member outside Georgia Tech?**

Only GT faculty can be selected in the online proposal committee form. Additional members will be approved by the Academic Office and added manually. Please inform the Academic Office of the intention to add an external member.

### **How long should the oral presentation be?**

Typical lengths are 30-45 minutes.

**Who do I contact to reserve a room?**

This should be handled by the Committee Chair who may delegate the task to their administrative aide.

**May I have my advisor/group members review the oral presentation?**

You may practice your oral presentation portion with anyone you choose, including faculty members and your advisor.

**To whom do I submit the proposal?**

The entire proposal package is submitted to the ECE Graduate Affairs Office. Students must visit the Academic Office prior to the submission to make sure they meet all the requirements.

**How do I know when the proposal has been released to the committee?**

You will receive an email from the ECE Graduate Affairs Office with a copy of your proposal memo.

## DISCLAIMER STATEMENT

The "Literature Survey" section of this proposal was prepared without input from my research advisor or any other person. While technical writing guides may have been referred to, I did not solicit or receive assistance from any other person while preparing this portion of this document.

Signed \_\_\_\_\_ (student) \_\_\_\_\_  
(print name)

Approved: \_\_\_\_\_(research advisor) \_\_\_\_\_  
(print name)