

ECE PhD Preliminary Exam

The preliminary exam is a written report and oral examination normally scheduled by a student after completion of the majority of course work, but prior to the main research of the dissertation. A student is not accepted as a candidate for the Ph.D. degree until the preliminary examination has been passed.

The examination consists of

- 1) a dissertation research proposal presentation and defense
- 2) an oral examination of fundamentals in the major field and related work

| Preliminary Exam Deadlines | |
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| Deadlines MUST be observed and followed. The Preliminary Exam will not be passed if the deadlines are not met. | |
| Preliminary Exam | Must be completed within 3 years of matriculation. Extensions, requiring justification and typically granted for only one semester, must be requested prior to the deadline and receive both DGS and Graduate School Dean approval. Students who have not completed their preliminary examination by the end of the 4 th year may be withdrawn by the Graduate School. |
| Committee Approval Form | Must be submitted at least 6 weeks prior to scheduled Preliminary Exam. The Graduate School <u>strictly</u> requires approval (including DGS and Graduate School Dean signatures) at least <u>30 days</u> prior to the Preliminary Exam. Submit the form 6 weeks prior to ensure time for all required signatures. |
| RCR Training | Twelve total hours should be completed over the course of your first three years at the University. |
| Coursework | Generally completed prior to the Preliminary Exam. If you have completed your coursework, submit a program of study with all grades in place and signed by your advisor and a second faculty member. This will ensure that you do not need to take further coursework prior to graduation. |

Committee Approval and Exam Scheduling

to establish your committee for the Preliminary Exam and Final Dissertation Defense

Creating Your Committee

Discuss your committee with your advisor, then ask the faculty to be on your exam committee as soon as possible after you've passed the Qualifying Exam. The supervising committee for your Prelim and Final Exams is not the same committee you had for your Qualifying Exam, but it can include the same members.

- The Exam Committee must consist of at least 5 members (ECE Departmental requirement)
- A majority of the committee members must be Duke Faculty
- All committee members must be part of the Graduate Faculty
 - To ensure that the faculty member is part of the Graduate Faculty, you can check here: <https://gradschool.duke.edu/academics/graduate-faculty>
 - Committee members who are not part of the Duke Graduate Faculty (e.g. industry experts or faculty from other universities) can be appointed as term faculty with a nomination from the student's advisor, approval from the appropriate curricular group, and DGS and Chair approval. Please inform the Graduate Office at least six weeks prior to the exam if you will need a committee member appointed or re-appointed (appointments last only 3 years) to the Graduate Faculty
- At least 3 committee members must have primary appointment to the ECE department (primary or joint)
 - You can check ECE appointment status on the ECE Website (<http://www.ee.duke.edu/faculty>)
- The committee chair must have a primary or secondary appointment to ECE
 - Most students choose their advisor to serve as the chair of the committee
 - If your advisor does not have a primary or secondary appointment to ECE, you must choose a committee chair or co-chair who does
- One member of the committee must be the student's advisor (ECE Department requirement)
- At least one committee member (the Minor Area Representative (MAR)) must be from a department or ECE field outside of the student's major research area; the required Minor Area Justification must be specific and thorough, especially when the MAR is an ECE faculty member.

The DGS approves committee membership and must consider potential conflicts of interest that may preclude some faculty from serving on some committees. The following are examples of conflict that will be considered:

- Graduate faculty who are married may not serve on the exams of the spouse's students
- Graduate faculty who are Research Faculty whose 9 month AY salary is fully or partially supported by an ECE faculty member may not serve on the exams of the supporting faculty member's students

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| <p>Completing the Committee Approval Form</p> | <p>Download the form at https://gradschool.duke.edu/sites/default/files/documents/form_committee_approval.pdf</p> <ul style="list-style-type: none"> • Be sure to check the box labeled “Original Committee” for the first form, “Committee Change” for following forms • Be sure to check the box labeled “PhD Preliminary Examination” • To complete the “Rank/Title” section of the form, check the title of faculty members in the Duke Directory (use search box at http://duke.edu/) • Complete the entry on the form for both Advisor and Chair, even if the same individual fills both roles • Leave the “Co-Chair” box blank if there is no co-chair (in ECE, it is common not to have a co-chair) • Indicate the Minor Area Representative by placing his or her name in the committee members blank labeled MAR • Submit a brief (1-2 sentences) justification of why you’ve chosen this member as the MAR for your committee <ul style="list-style-type: none"> ○ Explain what the MAR can contribute to your committee from outside your main research area ○ Explain why the MAR’s work is relevant to your committee |
| <p>Submitting the Committee Approval Form and Exam Details Form</p> | <p>Submit the form as soon as possible—the earlier the better! At a minimum, you must submit it SIX weeks prior to your Preliminary Exam</p> <p>All Committee Approval Forms must be submitted electronically</p> <ul style="list-style-type: none"> • All Duke students have access to Adobe Creative Cloud: https://software.duke.edu/node/26 • Once you have completed the form, save the form and submit it to the ECE Graduate Office via email <p>The DGSA will obtain the DGS signature and the Graduate School Dean’s signature and send you a copy of the completed form. This approval can take up to two weeks!</p> <p>Emergency changes require the submission and approval of a new committee approval form and can be made up to 48 hours before the exam</p> <p>Please enter your exam details at least three weeks prior to your exam here: https://duke.qualtrics.com/jfe/form/SV_bygP2d2XkuLX1gp</p> |
| <p>OPTIONAL: Using the Preliminary Exam as MS Exam</p> | <p>If you plan to use your Preliminary Exam as your MS Project or MS Coursework Exam, complete the following steps:</p> <ul style="list-style-type: none"> • Complete a second identical Committee Approval form at least six weeks prior to the exam, but change the exam you are requesting approval for to “AM/MS Examination” by checking that box • Apply for graduation in DukeHub for your MS degree |

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| | <ul style="list-style-type: none"> ○ If you have made the <u>graduation deadline</u> for the current term, then you will get your MS degree for the current term ○ If you have not made the graduation deadline for the current term, you will receive the MS degree in the next term ● When you complete the Exam Details Form for your preliminary exam, be sure to check the box that indicates you would also like to count the Preliminary Exam as your MS Exam ● Prior to the exam, remember to pick up your MS exam card from the Graduate Program Office and bring it to your exam for the committee to sign, along with your Preliminary Exam Report form <p>Students seeking an MS Thesis degree may not use the Preliminary Exam as the MS Exam and must schedule a thesis defense separately.</p> |
| <h2>Scheduling the Exam</h2> | <p>Considerations when scheduling your exam:</p> <ul style="list-style-type: none"> ● Schedule at least 1 month after the date the Dean of Academic Affairs signed your committee approval form ● Examinations can be conducted at any time within a term (after the first official day of classes and prior to the final exam date). With consent of a student's committee, examinations can be conducted during breaks between terms, but only if the student is registered for the term on either side of the break ● Use 25 Live to schedule a room, or use the Exam Details Form to request assistance with reserving a location ● Make sure that your room arrangement includes necessary technology for your planned presentation, and Pratt IT (help@pratt.duke.edu) or 919-660-5400 if you need assistance <p>Complete the Exam Details form at least 2 weeks prior to your exam:</p> <ul style="list-style-type: none"> ● Download the form at https://duke.qualtrics.com/jfe/form/SV_73Y6OoV4tcbe3T7 ● Complete the form entirely, being sure to note if the committee members will be participating remotely (maximum 2 remote members on a 5-person committee) ● The DGSA will send a reminder of the exam to the student and exam committee a week before and the day before the exam; the exam is closed to the public, so the exam will be announced only to the committee <p>Arrange for Catering</p> <ul style="list-style-type: none"> ● Complete the Exam Catering Form <ul style="list-style-type: none"> ○ ECE will supply refreshments (from Twinnies catering only) for up to six people; for over six people a student must make arrangements with and payments to Twinnies ○ Twinnies will deliver only to Hudson and CIEMAS; you may arrange to pick up from Twinnies and deliver yourself if your exam is scheduled in another location. |

- Upload the Exam Catering form with your exam details form or submit separately to the Graduate Office for a signature and a code
- Bring the Exam Catering Form to Twinnies at least 2 business days prior to the exam

Exam Preparation and Format

Preparing Your Written Document

Content and Format

The written dissertation research proposal should consist of a 10-page (maximum) report plus appendices providing additional supporting information. The report, which must be submitted to the committee at least two weeks prior to the exam date, should begin with a one-page executive summary, which answers the following questions and is written at a level that can be understood by an engineering/science student, i.e. using minimal jargon. Note: these questions are modifications of the Heilmeier questions.

- What are you trying to do?
- What is known about this topic today, or how is it done today? What are the limits of current practice/understanding?
- What is new in your approach, or what open question are you trying to answer? Why do you think it will be successful?
- Who cares? If you are successful, what difference will it make?
- What are the risks and corresponding plans to mitigate them?
- What are key steps in your effort and when do you anticipate reaching each? How will you judge success?

The remaining pages in the preliminary examination report should expound upon the answers to these questions and should include a concise description of research progress to date. This section should be written at a level to be understood by experts in the field, i.e. the preliminary examination committee.

The document must also contain an anticipated timeline for completion of all PhD degree requirements.

Supporting Information may be included in appendices, which should be organized based upon content. Examples of supporting information include: 1) more detailed information supporting the research plan and approach, 2) papers/presentations, 3) information on collaborations, 4) information on related research in the student's group, 5) relevant mathematical derivations or code.

The presentation should reflect the contents

Distribution

- Before you distribute your document to your committee members
 - Use other graduate students or writing center opportunities to help you proofread before distributing your document

- Gain advisor approval
- Email your written document to your committee at least two weeks prior to your exam date

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| <p>Preparing Your Oral Presentation</p> | <p>The Prelim Exam is an oral presentation and defense of your dissertation research proposal</p> <ul style="list-style-type: none"> • Plan for your presentation to last about 45 minutes with extra time allotted for questions posed by the committee throughout and after the presentation • Content is typically the same as your written prelim document • Have your advisor approve your slides prior to the exam • Practice your presentation <ul style="list-style-type: none"> ○ Practice with your advisor if possible ○ A good technical audience includes other graduate students in your lab and related labs (especially those who have taken the Prelim before) |
| <p>Preparation Assistance</p> | <p>Students are strongly encouraged to take advantage of non-technical language and grammar assistance offered at the Pratt Graduate Communications Center (email Bridget Fletcher: bridget.fletcher@duke.edu). Both writing and presentation feedback are offered.</p> |
| <p>Taking the Exam</p> | <p>Bring to the exam</p> <ul style="list-style-type: none"> • Your Preliminary Exam Report Form • A PhD Preliminary Exam Evaluation Rubric for each member of your committee <p>Exam components</p> <ul style="list-style-type: none"> • During the exam, the student gives an oral presentation of his/her dissertation research proposal and the faculty ask questions to determine if the proposal is appropriate and feasible • Be prepared to answer questions about your research proposal and plan as well as on fundamentals in the major field of study and related work <p>After the exam the student leaves the room, and the faculty discuss the student’s performance</p> |

Exam Outcomes and Exam Report Submission

Possible Outcomes

- Pass:
 - The student is now a PhD Candidate!
 - Requires at least four affirmative votes
 - Requires an affirmative vote from the chair of the committee
- Fail:
 - If a student fails the Preliminary Exam, the committee may allow the student to re-take the exam
 - A second attempt at the preliminary exam is NOT guaranteed
 - If a second attempt is allowed, the committee must remain the same as the original attempt, and the exam must be re-taken no sooner than 3 months and no later than 6 months after the original exam
 - If a second attempt is allowed, a failure of the second attempt results in dismissal from the ECE PhD program
 - If the preliminary examination committee is composed of four (4) members (by permission only for ECE), one negative vote fails the candidate
 - If the committee is composed of five (5) or more members (standard for ECE), a single negative vote does not fail the candidate; two or more negative votes always fail the candidate
 - A negative vote from the chair of the committee fails the candidate

Submit the outcome report

- Faculty who are present at the exam should sign the Preliminary Exam Report form and rubrics
- If a member has participated via teleconference, the DGSA will gather the rubric and the electronic vote of the committee member according to the guidelines provided by the Graduate School
- The student or the student's advisor should return these forms to the ECE Graduate Office

Please note that different outcomes may be given for MS Exam and Preliminary Exam if the exam is used to satisfy both purposes.