



ENEL Graduate Program Doctoral Candidacy Requirements

The University of Calgary [Graduate Candidacy Regulations](#) (“the Regulations”) govern the conduct of admission to graduate candidacy at the University of Calgary. This document presents the implementation of the *Regulations* in the Department of Electrical and Software Engineering, hereafter referred to as the ENEL Graduate Program.

A. Statement of Purpose

The Candidacy requirements in the ENEL Graduate Program test the student’s preparation to successfully complete the research, writing, and defending of their dissertation. Admission into candidacy indicates that students have a solid foundation not just in their particular fields of research but also in Electrical, Computer, and Software Engineering generally. Therefore, it requires that students have a well-developed plan for thesis research that includes a complete proposal with a well-motivated research question and statement on the potential contribution to the discipline of Electrical, Computer, and Software Engineering. It also requires that students have the necessary technical skills and background preparation to be judged able to follow through successfully on their proposed research plan.

B. Supervisory Committee

The supervisor, in consultation with the PhD student, must form a supervisory committee within three (3) months of appointing a permanent supervisor, as stated in the Faculty of Graduate Studies (FGS) Academic Calendar.

C. Preliminary Supervisory Committee Meeting

The PhD student, supervisor, and the members of the supervisory committee normally meet within the second term of the students’ studies, but not more than 10 months after beginning the students’ studies. The purpose of the preliminary meeting is for the student and supervisory committee to have an introductory discussion about the proposed research area.

The student will prepare a one-page document providing a description of the intended research project to be undertaken. The document must be submitted to the supervisory committee at least 1 week prior to the scheduled Preliminary Supervisory Committee Meeting.

The Preliminary Supervisory Committee Meeting should begin with an informal presentation (approximately 10 minutes) in which the PhD student will present the research project they intend to undertake. The committee will then discuss the proposed research area.

C.1 Scheduling of the Preliminary Supervisory Committee Meeting

The Supervisor will schedule the Preliminary Supervisory Committee Meeting in conjunction with the student and the supervisory committee members. The supervisor will inform the Graduate Studies Office in Electrical and Software Engineering of the timing of the meeting.

D. All doctoral students in the ENEL Graduate Program must successfully complete the following components:

As per the Graduate Calendar sections [G.K.1](#) and [G.K.3](#)



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1. PhD Coursework
2. Written thesis proposal
3. Combined Field of Study and thesis proposal Oral examination

E. PhD Course work Requirement

The PhD Coursework enables students to acquire advanced theoretical knowledge of topics needed for their research and, consequently, improve their fundamental knowledge. In addition, the Coursework provides students with the “know-how” to conduct research, basic scientific methods needed for research, and transferrable skills. The program requirements are listed in the Faculty of Graduate Studies (FGS) [Academic Calendar](#). Students must successfully complete the PhD Coursework within the first year of initial registration. The PhD Coursework consists of graduate course and professional development (PD) course requirements.

Graduate Course Requirement: 6 units (1 full-course equivalent) at the graduate level beyond the Master’s degree, or 18 units (3 full-course equivalents) at the graduate level beyond the Bachelor’s degree, with at least half the courses taken in the Departmental program. Students are advised to consult their Supervisor in selecting their graduate courses.

PhD Course Requirement: Engineering 601 (1.5 units) and Engineering 603 (1.5 units). Students in the PhD program who completed Engineering 601 and Engineering 603 while in the MSc program will not be required to take the courses for the second time.

G. Thesis Proposal Requirement

The thesis proposal requirement consists of both the written and oral components.

G.1 Written Thesis Proposal

The written thesis proposal shall include a Research Review and a Research Proposal.

The Research Review enables students to acquire and demonstrate in-depth understanding and knowledge of the relevant literature and current state of the art in their research topic. The purpose of the Research Proposal is to assess a student’s readiness and potential to successfully conduct independent and high-quality research. (See “Format of the Written Thesis Proposal” below, section G.2.)

The recommended deadline to successfully complete the written thesis proposal is 18 months from initial registration. The written thesis proposal is due at the end of the 17th month in the program to allow for one month of evaluation. A hardcopy and/or a softcopy of the written thesis proposal must be submitted to the Candidacy Examination Committee (CEC) and the Graduate Program Administrator (GPA).

The CEC is formed by the Supervisor, in consultation with the student, no later than 16 months after the student’s initial registration. The CEC shall consist of the Supervisory Committee plus two additional members: one internal and one internal/external examiner where the latter may also be from the Department but outside of the subject area of the student’s thesis. The Supervisor will chair the CEC and be a voting member.



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Please refer to Section [G.M.3.2](#) and [G.K.4](#) of the Graduate Calendar

G.2 Format of the Written Thesis Proposal

The written proposal should mirror a final thesis document, in terms of formatting, style, and content. The thesis proposal should normally be less than 30 pages of double-spaced written text and figures/tables (not including the abstract, any index, references, and appendices). The proposal document must be formatted using the style outlined for theses by the Faculty of Graduate Studies in the [Thesis Guidelines](#) document, which specifies the text spacing, font, margins etc. that must be adhered to when preparing the proposal. The document must be organized into two distinct sections: section 1 is the Research Review (maximum length of 20 pages) and Section 2 is the Research Proposal (maximum length of 10 pages). Each section must conform to the scope specified as follows:

Scope of the Research Review: The scope of the research review must cover and address three key elements:

1. Critical assessment of the relevant literature, i.e., critical evaluation, synthesis, interpretation, and inter-relationships among major publications in the existing literature;
2. Gaps in knowledge: What are not yet known and/or needed, for example, models, methodologies, and techniques; and
3. Open problems: Outline of research challenges to bridge the identified gaps in knowledge.

Scope of the Research Proposal: consists of and shall address five key elements listed as follows:

1. Research Questions and Motivation: What research questions will be answered and why? How do these questions fit into the current state of the art?
2. Potential Methodology: How will the research questions be answered? What potential techniques and methods will be used to answer the research questions?
3. Potential Contributions: What potential value and novelty will successful completion of elements (1) and (2) contribute and advance the state of the art of research area?
4. Preliminary Results: Briefly describe the achieved tangible evidence to demonstrate preliminary research progress.
5. Research Plan: What are the next steps following successful candidacy? What are the milestones, resource requirements, and timeline (i.e., schedule)?

G.3 Evaluation of the Written Thesis Proposal

The written thesis proposal will be evaluated by the Candidacy Examination Committee (CEC). The two sections of the written thesis proposal, Research Review and Research Proposal, are evaluated separately.

The Research Review section is evaluated based on its scope (i.e., the three key elements of research review listed in the previous section) and the Research Proposal section is evaluated based on its five key elements.

Each member of the CEC provides to the Chair and GPD a written evaluation of the written thesis proposal and makes a pass/fail recommendation on each of the Research Review and Research Proposal sections within a month of receiving the written thesis proposal. The outcome for each section is



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decided by a simple majority of the recommendations, which is communicated to the student by the Chair of the CEC.

To pass the written thesis proposal, a student must receive a “pass” on both the Research Review and Research Proposal sections. A student who receives a “fail” outcome in the written thesis proposal will be allowed to redo the failed section(s) and submit a revised version of the failed thesis proposal within three months of the failed outcome. A second failure of the written thesis proposal will result in a student being required to withdraw from the ENEL graduate program.

G. 4 Appeal of failed Written Thesis Proposal

In the case of a failed written thesis proposal, students may appeal the decision in writing to the Faculty of Graduate Studies (FGS). Please see [Academic Regulations](#) in the *Faculty of Graduate Studies Calendar*, section *G.O. Appeals – Appeals Against Faculty of Graduate Studies Rulings*.

H. Combined Field of Study and Thesis Proposal Oral Examination

The Combined Field of Study and Thesis Proposal oral examination is a single examination which consists of two parts: (1) an oral examination based on Field of Study components (see Section H.2) and (2) an oral examination of the approved written thesis proposal.

The purpose of the oral examination is to test the student’s understanding of the background material and literature relevant to the student’s research topic, the student’s ability to identify novelty in their research area and to test the student’s ability to present and defend their research plan.

The oral examination will also assess the student’s oral communication skills and ability to respond to questions. It is recommended that students successfully pass the Combined Field of Study and Thesis Proposal oral examination within 22 months of initial registration in the ENEL PhD Program.

H.1 Scheduling of the Combined Field of Study and Thesis Proposal oral examination

The oral examination can only be scheduled after successfully passing the written thesis proposal.

H.2 Field of Studies Oral Examination Topics Form

At least three months before the Oral examination, the CEC will discuss the project and decide upon the field of study topics (between 3 and 5), study material, and the level of understanding required. The topics for examination will be indicated on a “Field of Studies Oral Examination Topics” form. Suggested textbooks, journal publications and courses will be listed to inform the student of the expected learning level. The supervisor is responsible for obtaining signatures on this form from the student and all CEC members and then submitting the form to the graduate program director for approval. Any subsequent changes or revisions to the suggested reading materials will need to be listed on this form and approved by the student, supervisor and graduate program director at least 2 months prior to date of the Oral Examination.

The Supervisor should notify the GPD and the GPA at least three weeks before the oral examination date. The Supervisor should schedule the examination and send the GPA the details, i.e., the date, time, and information on CEC members (i.e., same members who evaluated the written thesis proposal): name, email address, and home department. The GPA will arrange a room for the examination and also prepare the *Oral Examination Notice* form, for signature of the student, supervisor, and GPD. The GPA sends the signed form to the examiners and the student.



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H.3 Format of the Oral Examination

The oral examination will be chaired by a Neutral Chair, appointed by the GPD at least three weeks before the date of the oral examination.

Immediately prior to the oral examination, the student will give a 15-minute public seminar to briefly summarize and highlight what has been more formally documented in their written Thesis Proposal Document. As with Thesis defences (Graduate calendar M.7.4) this public presentation will not include any questioning by members of the examination committee.

The scope of the oral examination is the content of the Field of Studies form (as set by the CEC) and the written Research Proposal. The oral examination will consist of at least two rounds of questions by the CEC members (examiners). The examiners should ask clear and succinct questions. The student should be given reasonable time to answer and should feel free to ask for questions to be repeated, rephrased, or clarified. Answers provided by the student can be both verbal and in writing on a board.

The duration of the oral examination will not exceed two hours, as per the [Graduate Calendar Section G.K.4.6](#). To reflect that the written thesis proposal has already been approved before the oral exam, an examiner is suggested to spend 30% of their allotted time on questions related to the Research Proposal portion of the oral exam and 70% of their allotted time on questions related to the Field-of-Study topics.

The two-hour duration does not include the deliberation time of the CEC. Prior to the deliberation, the Neutral Chair asks the student to leave the room.

H.4 Evaluation of the Oral Examination

A successful Oral examination is one where the student is able to demonstrate and articulate a clear understanding of the research proposal and mastery of the background material that forms the basis of their research.

At the end of the exam, the student is asked to withdraw from the room while the committee deliberates on the student's performance on the exam. At the end of the oral examination and before any discussion of the student's performance, each examiner must identify, by secret ballot, which recommendation (pass or fail) they favor based on the student's performance in answering questions on both the Field of Studies and the written thesis proposal. The Neutral Chair announces the result of the secret ballot. This provides the committee a frame of opinion upon which to base a full discussion of the student's performance. This may be followed by further discussion, moderated by the Neutral Chair, after which a final vote is called.

The outcome of the oral examination is a "pass" if the final vote by the CEC includes no more than one "fail" vote. If the final vote includes 2 or more "fail" votes, the outcome of the oral examination is a "fail." In this case, within five working days of the examination, each CEC member must submit a confidential report to the GPD explaining the reasons for their vote and copy to the Supervisor. The GPD, upon careful review of the reports, may uphold the "fail" in the case of a clear fail (i.e., 3 or more

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“fail” votes) or refer to the FGS for decision in the case of an unclear fail (i.e., 2 “fail” votes). If the GPD upholds the “fail,” after consultation with the Supervisor, the GPD then provides an anonymized summary of the essential points from the examiners’ reports to the student, copied to the Supervisor. The GPD will also send the student the formal notice of a failed oral examination of the thesis proposal within ten working days from the date of the examination.

A student who fails the oral examination will be allowed to re-take the examination within three months of the failed examination. A second failure of the oral examination will result in a student being required to withdraw from the ENEL graduate program.

H.5 Appeal of failed Oral Examination

The appeal process is identical to that of failed written thesis proposal (section G.3).

I. Candidacy Process for Master’s Students transferred to the PhD Program

Master’s students in the ENEL program and transferred to the PhD program must complete the following components of the candidacy process:

1. PhD Coursework: The requirement of 18 units (3 full-course equivalents) at the graduate level beyond the Bachelor’s degree must be met.
2. Written thesis proposal, as described in section G.
3. Combined Field of Study and Thesis Proposal examination, as described in section H.

The deadline to complete the above requirements is a maximum of 12 months from the transfer date: the first 8 months to complete 6 units of courses at the graduate level (additional to the 12 units of courses at the graduate level and the two PD courses completed while enrolled in the MSc program) and the next 4 months to complete the field of studies and thesis proposal requirement.

J. Extension to FGS Candidacy Requirement Deadline

According to the University of Calgary Doctoral Candidacy Regulations, Doctoral students must complete all candidacy requirements within 28 months of first registration. Those students who have transferred from a Master’s program must complete all candidacy requirements within 36 months of the first registration in that Master’s program. Students who will not complete their candidacy requirements by the above deadline must have an extension request approved by the Faculty of Graduate Studies. When requesting an extension, the student and supervisor should specify a date for the oral examination and plan the extension request around that date. Once a date has been decided, the [extension request form](#) should be completed with an explanation of the reasons for the delay. Normally, it must be signed by the Supervisor and the GPD. The completed and signed form should be submitted to the GPA to be sent to FGS for approval. Please note that the form should be submitted by the end of the 27th month in the program for Doctoral students or the end of the 35th month in the program for Master’s transfer students to allow time for processing.

K. Health and wellness

Oral exams can be very stressful for students. If there are concerns about a student’s well-being during the preparation period for an oral exam, the student should contact the [Student Wellness Centre](#). Students are encouraged to attend workshops that will help them prepare for an oral exam. Supervisors will also be required to provide practice oral examinations, in a

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format similar to the oral examination, at least one to two weeks prior to the examination that should help alleviate student stress. International students are also encouraged to attend workshops that will help them improve their English-language communication skills. Students are also encouraged to practice their presentations with their peers. [MyGradSkills](#) is a great resource for help preparing for this oral exam.

Appendix 1: Flowchart of Recommended Maximum Timeline¹ for Candidacy Process in the ENEL Graduate Program.

| Month | | Milestone |
|-------|--|---|
| 1 |  | |
| 2 | | |
| 3 | | Appointment of Supervisory Committee |
| 4 | | |
| 5 | | |
| 6 | | |
| 7 | | |
| 8 | | |
| 9 | | |
| 10 | | Preliminary Supervisory Committee Meeting |
| 11 | | |
| 12 | | Complete PhD Course work requirement |
| 13 | | |
| 14 | | |
| 15 | | |
| 16 | Candidacy Examination Committee (CEC) formed | |
| 17 | | |
| 18 | Complete written thesis proposal | |
| 19 | Field of Study Topics assigned by CEC | |
| 20 | | |
| 21 | | |
| 22 | Complete Oral Examination | |
| 23 | | |
| 24 | | |

Footnote 1: Students, with the agreement of their supervisory committee, have the option of completing the components earlier than the typical timeline.