



Geomatics Engineering 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 establishes program specific requirements associated with the conduct of admission to graduate candidacy in Geomatics Engineering under the Regulations.

Statement of Purpose

Admission into candidacy in the Geomatics Engineering Graduate Program requires that students have a solid foundation in the principles and methods of Geomatics Engineering relevant to their particular fields of research. It requires that the students critically think about their research project and evaluate its merit in the context of existing knowledge in their field, and have a well-developed plan for thesis research, including a proposal with a well-motivated research question and potential contribution to the discipline of Geomatics Engineering. It requires that the students have the necessary technical skills and background preparation to be judged able to follow through successfully on the proposed research plan.

All doctoral students in the Geomatics Engineering Graduate Program must successfully complete the following components:

1. All course requirements.
2. A literature review about the student’s field of research in consultation with the Supervisory Committee members.
3. A written thesis proposal that must be evaluated and approved by the student’s Supervisory Committee.
4. A subsequent Field of Study (FoS) examination, with a written and an oral component to be evaluated by the Candidacy FoS Examination Committee.

Timeline

In the Geomatics Engineering Graduate program, it is expected that the majority of the students will complete the Candidacy requirements within 24 months of first registration, with the following timeline:

- Course requirements: between the first 8 and 12 months of the program depending on date of admission;
- Literature review: within the first year of the program;
- Thesis proposal: between 12 and 18 months following admission in the program;
- FoS examination: between 18 and 24 months following admission in the program.

Literature Review

Ph.D. students in the Geomatics Engineering program must complete a literature review in their field of research. The purpose of the literature review requirement is to launch the doctoral student’s research agenda by providing a description and critical analysis of the most significant studies conducted in the research field, and begin the exploration of research questions. The review should demonstrate the student’s understanding of the literature and ability to identify key issues in a specific field, which can lay the groundwork for the research question(s) in the thesis proposal. If the research covers more than one field, the review should present the literature in the relevant fields and indicate how they are related to the research question(s). The literature review should not exceed 6 pages in length (excluding references, tables and figures).

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The literature review shall be provided to the student's Supervisory Committee. Within three weeks after receiving the document each committee member will provide in writing constructive feedback to the student, which may also include a list of additional references to be included in the literature review. The student should revise the literature review accordingly and then proceed with the development of the thesis proposal. The literature review will serve as the first section of the thesis proposal.

Thesis Proposal

The thesis proposal is a key element of the candidacy requirements. This document is normally submitted by the student after the course requirements have been met, and after the literature review has been completed after consultation with the Supervisory Committee.

The thesis proposal should normally not exceed twenty five pages in font size 12 (excluding references, table of contents, and timeline). The proposal must contain the literature review, clear and explicit research objectives, a detailed description of the proposed methodology, a description of the anticipated outcome(s) and impact of the research, a preliminary table of contents, and a timeline for the completion of the research including a brief summary of the accomplishments to date (if applicable).

The thesis proposal will be reviewed by the student's Supervisory Committee. The committee members will provide constructive feedback for improvements, and may include additional recommendations of textbooks or scientific papers for the student to read in order to improve aspects of the thesis proposal. The Supervisor will coordinate the revision process.

A formal evaluation meeting chaired by the Supervisor will be scheduled with the student and the Supervisory Committee for the approval of the thesis proposal. At the beginning of the evaluation meeting, the student will give a presentation of about 20 minutes to highlight the objective(s) of the proposed research, the most important aspects of the methodology, and the expected results and impact of the research. The Supervisory Committee members will ask questions to evaluate the student's ability to clearly articulate the relevance, novelty, and feasibility of the proposed research. The meeting, including the student's presentation and question period, should not exceed two hours.

At the end of the evaluation meeting, the committee members will make a decision based on the following options:

- "Pass" means that the student has proposed a sound, credible research plan that is likely to answer the research problems posed, and that will advance knowledge in the Geomatics Engineering field of specialization.
- "Pass with revisions" means that the student must make amendments to the thesis proposal as identified during the meeting.
- "Fail" means that the student is unable to clearly articulate and justify the proposed research to the committee members, and that the research plan and expected results lack the original contribution expected in a Ph.D. research.

Unanimous agreement among the members of the Supervisory Committee should be reached to approve the thesis proposal. In the case of a "Pass with revisions", each committee member will provide a list of amendments to the student within five working days following the evaluation meeting. The amendments must be completed within a month of the date of the evaluation meeting. If the corrections are minor (i.e., changes can be completed within a week), the

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committee members might approve the revised thesis proposal without calling a meeting with the student. If the corrections are important (i.e., changes require more than a week for completion), a second evaluation meeting of the Supervisory Committee with the student may be required. Only one revision will be allowed to the student at this stage.

In the case of a 'Fail', the student will be given between two and six months to thoroughly revise the thesis proposal before another evaluation meeting with the Supervisory Committee members is scheduled. In the case of a second 'Fail', the student will be asked to withdraw from the program.

If no unanimous vote is reached, the vote that requires the most substantial corrections to be made to the thesis proposal by the student shall prevail.

Appeal of Thesis Proposal

In the case of a failed thesis proposal, students have the right to appeal to the Faculty of Graduate Studies (FGS). Students must submit their appeal in writing to the Chair of the FGS Appeals Committee within fifteen days of the unfavourable decision. In their letter they should cite their reasons for the appeal. The FGS Appeals Committee shall report, in writing, its decision to uphold or deny the appeal, to the Dean of Graduate Studies and the appellant as quickly as possible. Details on the procedures for appeals to the FGS Appeals Committee can be found at: grad.ucalgary.ca/current/managing-my-program/appeal. If a fail is upheld after a re-take, the student will be asked to withdraw from the program.

Field of Study (FoS) Examination

Ph.D. students in the Geomatics Engineering Program must complete a FoS written and oral examination to be evaluated by the Candidacy FoS Examination Committee. The purpose of the exam is to evaluate:

- the student's fundamental knowledge in the proposed research area; and
- the student's skills and ability to successfully complete the proposed research.

The written component is an open book on-site examination of three hours duration in the student's field(s) of specialization. Questions for this exam will be provided to the Supervisor by each member of the Examination Committee, and will cover the material in the reading list provided to the student (see Scheduling of the FoS Examination below). The Supervisor will provide the document(s) with the examination questions to the Graduate Program Director (GPD) for approval. The oral examination will further test the candidate's knowledge of his/her field of study, in addition to providing an opportunity to clarify and extend answers in the written examination.

Composition of the Candidacy FoS Examination Committee

The FoS Examination Committee consists of the Supervisory Committee of the student (including a Co-Supervisor if applicable), plus two additional members recommended by the GPD who could be internal or external to the program or the University. The additional members will be selected in consultation with the student, based on his/her expertise in the student's area of research and cannot have collaborated with the supervisor and co-supervisor or the student over the last five years. A Postdoctoral fellow whose supervisor is on the supervisory committee may not serve on the examination committee. A non-voting neutral chair, internal or external to the program, will be appointed by the GPD to chair the FoS oral examination.

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Scheduling of the FoS Examination

The student's Supervisor shall send a copy of the approved thesis proposal of the student to the additional member of the FoS Examination Committee. After consultation with the student and the Supervisor, each member of the FoS Examination Committee shall then submit to the student a reading list that will form the basis of the questioning at the FoS examination. This reading list can include references of articles and textbooks already incorporated in the literature review and thesis proposal of the student, along with any additional references related to the student's field of research that are judged important. The student shall be allowed at least one month after receiving the reading list to prepare for the FoS examination.

The student's Supervisor shall submit a Field of Study Examination Application Form to the Geomatics Engineering graduate office at least four weeks before the proposed date of the FoS written exam. This form shall list the members of the FoS Examination Committee and the date, time, and location of the written and oral components of the exam. The oral examination will normally be scheduled one week after a successful written exam.

Evaluation of the Written Component of the FoS Examination

Each Examination Committee member will evaluate the student's performance in the written question(s) they provided, and submit the student paper to the GPD marked on the UCalgary letter grade scale. The GPD will compute the overall grade of the written component as the average of the marks from each examiner. An overall grade of B- is required for passing the written examination. In case of a passing grade, the GPD will inform the supervisor and the student that they can proceed with oral examination.

In case of a fail grade, only one re-take of the FoS written exam will be permitted, which must take place no sooner than two months and no later than six months from the date of the first examination. Normally, the composition of the committee will remain the same. A second failure requires the student to withdraw from the program.

Appeal to a Failed FoS Written Examination

Students who fail the Candidacy FoS Written Examination have the right to appeal to FGS. Students must submit their appeal in writing to the Chair of the FGS Appeals Committee within fifteen days of the unfavourable decision. In their letter they should cite their reasons for the appeal. The FGS Appeals Committee shall report, in writing, its decision to uphold or deny the appeal, to the Dean of Graduate Studies and the appellant as quickly as possible. Details on the procedures for appeals to the FGS Appeals Committee can be found at: grad.ucalgary.ca/current/managing-my-program/appeal. If a fail is upheld after a re-take, the student will be asked to withdraw from the program.

Evaluation of the Oral Component of the FoS Examination

At the beginning of the FoS Oral Examination, the Committee will give the opportunity to the student to clarify or improve upon her/his answers to the written questions. The oral exam will, except for the evaluation, be conducted using the same procedure as for the Ph.D. final examination. The exam will include two or more rounds of questions by the committee members in the order indicated by the neutral chair at the beginning of the exam. The duration of the oral exam will not exceed two hours.

At the end of the FoS Oral Examination, the committee can decide if the student must

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complete remedial work to meet the expectations of the Candidacy as stated in the Statement of Purpose. Possible outcomes are “Pass”, “Pass with remedial work”, and “Fail”. The criteria are as follows:

- “Pass” means that the student has adequate knowledge and skills to conduct research in the proposed area.
- “Pass with remedial work” means that a gap in the knowledge of the student has been identified and that the student must acquire the missing knowledge through independent study.
- “Fail” means that the remedial work required to acquire adequate knowledge in the area of research is so extensive that a re-examination is required to establish attainment of the required skills.

Should the outcome of the final vote be unanimously positive or include only one negative vote, the student will pass. A “Pass” on the FoS Oral Examination advances the student to the category of "Candidate for the Ph.D." in the Geomatics Engineering Graduate Program. In the case of a “Pass with remedial work”, the committee members will indicate the nature of the remedial work that is requested and the time allowed to complete it, which should not exceed four months after the date of the exam. The student must provide evidence to the FoS Examination Committee that the remedial work has been accomplished before completion of the Candidacy.

If the committee evaluation results in two or more “Fail” votes, the committee’s recommendation is “Fail”. In such a case, within one working day of the completion on the examination, the Neutral Chair must submit a written report on the outcome and the procedures followed to the GPD and, within five working days from the date of the examination, each committee member must provide a written report explaining the reasons for their vote to the GPD. The GPD may uphold the fail in the case of a clear fail, or refer to FGS for decision in the case of an unclear fail.

Only one re-take of the FoS exam will be permitted. The re-take must take place no sooner than two months and no later than six months from the date of the first examination. Normally, the composition of the committee will remain the same. A second failure requires the student to withdraw from the program.

Appeal to a Failed FoS Oral Examination

Students who fail the FoS Oral Examination have the right to appeal to FGS. Students must submit their appeal in writing to the Chair of the FGS Appeals Committee within fifteen days of the unfavourable decision. In their letter they should cite their reasons for the appeal. The FGS Appeals Committee shall report, in writing, its decision to uphold or deny the appeal, to the Dean of FGS and the appellant as quickly as possible. If a fail is upheld after a re-take, the student will be asked to withdraw from the program. Details on the procedures for appeals to the FGS Appeals Committee can be found at: grad.ucalgary.ca/current/managing-my-program/appeal.

Extension of Candidacy Requirements Deadline

Students who do not complete their candidacy requirements by the end of their 28th month in program, or 36th month if transferred from a Master’s program, for any reason must have an extension request approved by FGS. When requesting an extension, the student and Supervisor shall discuss a plan with proposed deadline to complete all the candidacy requirements. The extension request form should be completed with an explanation for the reason for the delay and a proposed plan for completion of the requirements. This form must be signed by the student’s Supervisor and the GPD before being submitted to FGS for approval.

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