



## Cumming School of Medicine Graduate Science Education

### Doctoral Candidacy Requirements - Overview

Admission to Candidacy is governed by the University of Calgary Doctoral Candidacy Regulations (<http://www.ucalgary.ca/pubs/calendar/grad/current/gs-j.html>). This document establishes requirements associated with the admission to candidacy in the following Cumming School of Medicine (CSM) graduate science education (GSE) graduate programs, which comply with those regulations:

MDBC – Biochemistry and Molecular Biology  
MDCV – Cardiovascular and Respiratory Sciences  
MDGI – Gastrointestinal Sciences  
MDIM – Immunology  
MDMI – Microbiology and Infectious Diseases  
MDNS – Neuroscience  
MDSC – Medical Sciences

#### A. Statement of Purpose

Admission into candidacy in the CSM GSE Graduate Programs requires that students have a solid foundation of knowledge and comprehension of topics and concepts in their field of research. Students must demonstrate the ability to design a hypothesis-based research project that will contribute to their field, and display a solid understanding of the necessary technical skills required to complete their research project. In determining a student's suitability for candidacy the following attributes will be assessed: breadth and depth of knowledge in the research area, clarity of thinking, ability to communicate clearly, critical thinking (ability to judge their own work and the work of others) and adaptive thinking (ability to integrate new ideas).

#### B. Requirements for admission to Candidacy

All doctoral students in the CSM GSE Graduate Programs must successfully complete the following components to be admitted to Candidacy:

1. All academic course requirements
2. Program-specific certifications
3. Evaluation and approval of thesis proposal
4. Field of study (FOS) examination (oral)

A flowchart describing the timeline for scheduling and completion of each component is provided.



### **1. Program-specific academic course requirements**

Graduate courses in the CSM promote the acquisition of both broad and deep knowledge within a specific area of study. PhD students must complete 9 units (3 half-course-equivalents) of specified graduate-level courses outlined by their programs and approved by their supervisory committees. These courses must be completed before the FOS exam can occur, but the thesis proposal evaluation can proceed before course work is completed. A student will have to maintain an overall B average and not less than a B- in any individual course. If these criteria are not maintained, they may be asked to withdraw from the program.

### **2. Program-specific laboratory certification and research ethics course**

The CSM requires that students working with chemicals, biohazards, radioactivity, and/or animals complete the necessary training requirements and certification prior to beginning their research project and/or working in the laboratory. Students working with human primary material or subjects will also need approval from the Conjoint Health Research Ethics Board (CHREB) prior to initiating their research.

Students are also required to attend a Research Integrity Day, focused on Academic Integrity and Responsible Conduct of Research (<http://grad.ucalgary.ca/current/managing-my-program/academic-integrity>) provided by the GSE office. This is a CSM requirement and must be completed before completion of the FOS examination.

### **3. Thesis Proposal**

#### Timeline and format of the thesis proposal

Within 3 months of entry into the program, students shall establish a Supervisory Committee consisting of the supervisor and at least 2 additional faculty members (submit signed form “Recommendation for Approval of Supervisor and/or Supervisory Committee” to the Graduate Program Director (GPD)). A research proposal must be submitted to the student’s supervisory committee within 12 months of the student’s initial registration in the Faculty of Graduate Studies. The Supervisor and supervisory committee members will provide research guidance to the student in the development of the project proposal, but the student must write the final document. For the CSM GSE Graduate Programs, the research proposal must be between 13 and 17 single-spaced pages (excluding figures, tables and references, .75 inch margins and 12 point font). A suggested (but not mandatory) format for the research proposal is:

- Introduction (approximately 4-6 pages – should contain an appropriate literature review of the field and the project)
- Relevant Preliminary Data (approximately 3-4 pages)
- Hypothesis and Specific Aims (approximately 1/2 page)
- Experimental Plan (approximately 5-6 pages)
- Significance (1/2 pages)

After the initial submission of the proposal, the supervisor and supervisory committee will work with the student to develop a final version of the research proposal. A final version of the research proposal must be submitted and evaluated no later than 21 months (for students directly entering into a PhD program) or 25 months (for students who switch from an MSc program to the PhD program) of initial

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registration. The proposal will then be evaluated as described below.

#### Thesis Proposal Evaluation Committee

The thesis proposal evaluation committee will consist of the supervisor, supervisory committee members and one additional faculty-level evaluator who currently holds supervisory privileges within FGS (and who is approved by the graduate program). This person can be either internal or external to the student's graduate program.

#### Setting up Thesis Proposal Evaluation Committee Meeting

The purpose of the thesis proposal evaluation is to ensure that a student has sufficient preparation to be successful with their thesis research. The expectation is that the student has a clearly defined, novel and high-quality research plan that they are capable of conducting and defending.

An evaluation committee meeting will be scheduled no later than 21 months, for direct PhD entry students, or 25 months, for MSc transfer students, after initial registration. At least one week before this meeting, the student will submit their proposal to their supervisor, committee members and one additional faculty-level evaluator. A form describing the composition of the committee and date of meeting to approve the proposal shall be submitted to the graduate program administrator (GPA).

#### Proposal Evaluation

Evaluation committee members will each provide brief written feedback (Evaluators assessment of thesis proposal form) on the quality of the proposal to the supervisor at the beginning of the Proposal Evaluation meeting. The student will be given a copy of the reports at the end of the meeting and copies will also be sent to the GPA. The student will give a 15 minute presentation outlining the research proposal. This will be followed by a critical evaluation and discussion of the proposal by the evaluation committee members focusing on the hypothesis and **experimental plan**, including a demonstration by the student of an understanding the background for the project, concepts and methods employed as well as experimental interpretation and potential pitfalls. The Supervisor will chair the evaluation meeting, but will refrain from answering questions directed to the student. The discussion of the proposal and questions to the student will last no longer than 90 minutes. After the discussion, the student will leave the room. Both the written document and the student's ability to understand and defend their proposal will be separately evaluated. The supervisor can participate in the discussion but is a non-voting member.

#### Written Evaluation:

The reviewers will decide if the written proposal can be accepted as submitted with no further changes. The proposal will be evaluated based on:

- 1) Relevant background knowledge to support the rationale of the proposed research project
- 2) Preliminary data that demonstrates experimental competency
- 3) Clear Hypothesis and Specific Aims of a body of work appropriate for a PhD project
- 4) Detailed experimental plan with expectations, pitfalls and alternative approaches
- 5) Significance of the proposed work within the research field

A unanimous decision of whether the proposal is acceptable or unacceptable is required. If the evaluators fail to arrive at a unanimous recommendation, the supervisor will adjourn the discussion

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and inform the Associate Dean – GSE of “lack of unanimity”. The final decision will be at the discretion of the Associate Dean – GSE, CSM.

If a revision is required, the student will have up to six months to submit a revised proposal and hold a second thesis proposal evaluation committee meeting. Committee members will decide the nature of the revision during a post-evaluation discussion. Required changes will be summarized and communicated in writing to the student by the supervisor within one week (with a copy to the GPD and GPA). A second approval meeting of the revised proposal following the same format will be held. If the second version of the proposal is not approved (either the written document or the student’s ability to understand and defend their proposal), the student may be asked to withdraw from the PhD Program or transfer to the MSc Program. The timing of the Field of Study Examination may be adjusted to reflect any delayed approval of the proposal. An extension request form must be submitted to the GPA for approval by the GPD.

#### Oral Evaluation:

The reviewers will decide if the oral defense of the proposal is acceptable or unacceptable. Evaluators will consider the student’s ability to:

- 1) Understand the relevant background information
- 2) Interpret and understand preliminary data
- 3) Defend the hypothesis, specific aims and experimental plan

A unanimous decision of whether the oral defense of the proposal is acceptable or unacceptable is required. If the evaluators fail to arrive at a unanimous recommendation, the supervisor will adjourn the discussion and write a short report to inform the Associate Dean – GSE of “lack of unanimity”. The final decision will be at the discretion of the Associate Dean – GSE, CSM.

If the oral is deemed unacceptable, a second Proposal Evaluation Committee meeting will be repeated within six months. If the second oral examination is not approved, the student may be asked to withdraw from the PhD Program or transfer to the MSc Program.

#### Appeal of an Unacceptable Proposal Evaluation:

In the case of an unacceptable proposal, students have the right to appeal. Students must appeal directly to the Faculty of Graduate Studies (see the Graduate Calendar – section [N.2 Appeals Against Faculty of Graduate Studies Rulings](#)).

*Once approved, the field of study exam can move forward even if the project might evolve and change after the proposal has been approved. The proposal is an academic exercise testing the student’s ability to write and defend a proposal. **Delays to acquire more data are not appropriate and strongly discouraged.***

A copy of the approved proposal will be provided to the GPA. All evaluation committee members indicating that they have approved the proposal and its oral defence will sign an evaluation form.



#### 4. Field of Study Examinations

##### Scheduling of the FOS examination

PhD students in the CSM GSE graduate programs must complete a field of study (FOS) examination in their research area. At least three months before the FOS examination (this can be before the thesis proposal evaluation), the committee members will work together with the students to define a list of topics for study and a reading list for the FOS exam (GSE field of study examination preparation form). The specific number of topics may vary based on the student's background knowledge and area of study. The FOS exam will be scheduled no later than the 24<sup>th</sup> month for direct PhD entry students or 28<sup>th</sup> month for MSc transfer students. At least four weeks before the exam, the supervisor should notify the GPA of the date, time and place of the exam, and composition of the examination committee. The GPA will assign a Neutral Chair from the approved pool of Neutral Chairs. A copy of the student's Thesis Proposal and assigned study topics and reading list must be circulated to all members of the examination committee at least two weeks before the exam.

##### Process of Field of Study Examination

The FOS exam is a formal oral exam. The exam will be comprehensive, covering a broad range of topics in the student's core field of research. The student is expected to have an in-depth understanding of the topics related to their core field of research, as well as a strong foundational knowledge in their field. These areas, as well as a detailed reading list will be provided to the student prior to the examination (see above).

**Students will not be re-evaluated on their written thesis proposal at this examination, which has already been evaluated and approved.** The FOS exam is to be based on the broad field of knowledge required to carry out the research proposal as specified on the FOS preparation form, and not based on the proposal *per se*. It is the responsibility of the Neutral Chair to ensure that the examination committee adheres to these guidelines. To advance to candidacy, a student must be well versed in their area of research. They should be able to integrate their data into a broader context and understand how their research project will expand knowledge in their field. They should be able to understand the importance and relevance of their research.

The examining committee includes the Supervisor (and co-supervisor, both non-voting observers), at least two (but not necessarily all) of the student's supervisory committee members, and two faculty members external to the committee, one of whom is also external to the program. If an appropriate examiner cannot be found who is external to the program, an internal examiner can be selected if there is no conflict of interest and the GPD has approved them. The exam will last up to 2 hours. There will be two rounds of questions for all examiners, and further follow up questions if time permits. The Neutral Chair is responsible to ensure that examiners ask clear and succinct questions. The student should be encouraged to ask for clarification where necessary and to take their time answering. Examiners should only direct their questions to the candidate and not discuss with other examiners during the exam. If the student has understood the question and cannot answer, the examiner should pass to another question and not attempt to extract an answer by prolonged interrogation or by leading the candidate. If an examiner leaves the room, the exam must be stopped until they return.

##### Evaluation of FOS examination

After the examination is complete, the student and supervisor will leave the room. The Neutral Chair

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will explain the procedures of evaluation. There will first be an anonymous straw vote that provides a framework to initiate discussion. The goal of the discussion is to reach a consensus recommendation, however unanimous decisions are not required (it takes at least 2 negative votes to fail). The committee will then complete the Examination report form, which will be delivered by the Neutral Chair to the GSE office. The Neutral Chair will provide committee feedback to the student and supervisor.

### Failed FOS Examination

If the student fails, voting committee members and the Neutral Chair must submit a written report within five business days to the Associate Dean – GSE, CSM, outlining the reasons for the negative assessment. Any student who fails the FOS examination will be given an opportunity to retake the failed oral examination (not before two months but less than six months after the first attempt). A student has the option to transfer to the MSc program only after the first failure. A student will be required to withdraw from the program upon a second failure of the FOS exam. In the case of a failed examination, students have the right to appeal. Students must appeal directly to the Faculty of Graduate Studies (see the Graduate Calendar – section [N.2 Appeals Against Faculty of Graduate Studies Rulings](#)).

### Extension to FOS Examination Deadline

Students who fail to complete the candidacy requirements by the 28<sup>th</sup> month of their program may be required to withdraw, unless there are exceptional circumstances and an extension is approved by the Graduate Program Director and the Associate Dean – GSE, CSM. A date must be set and the extension request form (obtained from the GPA) should be completed with an explanation of the reasons for the delay. The form must be approved by the Supervisor, GPD and the Associate Dean – GSE, CSM. The completed and signed form should be submitted to the GPA for approval.

### **Health and wellness**

Oral exams can be very stressful for our 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 center (<https://www.ucalgary.ca/wellnesscentre/>). Students should also be encouraged to attend workshops that will help them prepare for an oral exam. Supervisors will also be required to provide oral practise examinations, in a format similar to the FOS examination, at least one month prior to the FOS 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 practise their presentations with their peers.

MyGradSkills (<http://www.ucalgary.ca/mygradskills/>) is a great resource for help preparing for this oral exam.

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Direct PhD  
entry

MSc to PhD  
transfer

3 months\*

3 months\*

12 months

12 months

21 months  
minus 1 week

24 months  
minus 1 week

21 months

24 months

22-24 months

25 - 28 months

Set up supervisory committee



Supervisory committee  
meeting and working draft  
of proposal



Student distributes final  
proposal to evaluation  
committee



Thesis Proposal evaluation  
committee meeting



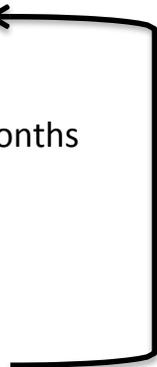
FOS exam



Admission to Candidacy

TOPICS for FOS exam (see 2)

3 months



Notes:

- 1) During the first 24 months student should complete all required course work and program specific requirements
- 2) The topics for the field of study exam must be given at least 3 months before this exam. Depending on the spacing of the two exams, this may occur before the thesis proposal evaluation meeting.