

PhD Comprehensive Examination I and Comprehensive Examination II

The PhD Comprehensive Examination consists of two parts; an oral background examination (PhD Comprehensive Examination I) to be completed by the end the third term (fourth term if from an incomplete MASc) of registration and an oral proposal examination (PhD Comprehensive Examination II) to be completed by the end of the fifth term (sixth term if from an incomplete MASc) of registration.

The Comprehensive Background Examination will examine the breadth of the candidate's knowledge in their area of specialization and the adequacy of the candidate's background preparation to pursue that area of research. The specific topics examined are defined by the list of background subjects (approved by the supervisor and Advisory Committee members) in the *PhD Comprehensive Background Examination form*.

The Comprehensive Proposal Examination will examine the research proposal that the candidate intends to develop into a PhD research thesis.

Please review the below guidelines and contact the [Academic Services Coordinator – BME Grad](#) for any additional questions regarding the PhD Comprehensive Examination.

Comprehensive Examination I - Background Examination

The Comprehensive Background Examination would be held in the third term (fourth term if from an incomplete MASc) and must successfully be completed before the Comprehensive Proposal Examination can be booked. Students who fail the background exam will be permitted to retake the exam before the end of the subsequent term. Students who fail the re-examination must withdraw from the PhD program.

Advisory Committee

The Advisory Committee must consist of the student's supervisor(s) plus three University of Waterloo faculty members of which at least two must be a BME graduate faculty member (internals), and one must not be a BME graduate faculty member (internal/external). It is the responsibility of the supervisor to form the Advisory Committee. The committee will remain the same for the student's PhD Comprehensive Proposal Examination and becomes, in part, the committee for the PhD Thesis Defence (which additionally includes an external examiner from outside of UW).

A *PhD Comprehensive Background Examination form* must be submitted to the [Academic Services Coordinator – BME Grad](#) at least four weeks prior to the desired exam date with the signatures of all committee members. The committee must be approved by the Director of Biomedical Engineering Graduate Program.

The supervisor will need to select a Chair for this examination. The role of the Chair is to ensure that the examination is conducted according to the examination guidelines. The Chair is not an examiner and cannot vote.

All committee members must attend the comprehensive background examination; appointment of delegates for comprehensive background examinations is not allowed. Remote participation through electronic means such as teleconference or video conference is permitted. If the comprehensive

background examination is scheduled as hybrid, the student, supervisor(s), and chair are not permitted to attend remotely.

Preparing for the Comprehensive Background Examination

The candidate is to provide the committee with an abstract (maximum of 1 page) of their research.

The background subjects listed on the *PhD Comprehensive Background Examination Form* are to be suggested by the candidate's supervisor(s) and then discussed and approved by all committee members. Once the background subjects are agreed upon, the committee will also define the references that are to be used for the examination of each background subject. The supervisor(s) is to share the background subjects and references with the candidate on behalf of the committee.

It is expected that committee members come to the PhD Comprehensive Background Examination with questions prepared (based on the references) in advance. The committee's questions should be based on the background topics listed on the form and the resources provided to the candidate. The questions should probe the candidate's knowledge in each background topic. The candidate should demonstrate mature insight and fundamental understanding of each topic.

Conduct of the Comprehensive Background Examination

The Chair will introduce themselves, the candidate and all committee members at the start of the examination. The committee will begin the examination with the questioning of the candidate's background technical knowledge. The first round of questions will typically last about 15 minutes each (co-supervisors share time). The Chair may declare a short break during the examination, after which the second round of questions will continue for about 10 minutes each. The question period is to be a maximum of 2 hours. Only the Chair and members of the Advisory Committee are permitted in the examination room. At the conclusion of the questioning period, the candidate must leave the room for closed deliberations.

In the case that there is more than one supervisor, the co-supervisors vote is divided fractionally among them such that each may vote independently but the total supervisor vote (one) remains unchanged.

Once a decision has been reached, the Chair will inform the candidate of the committee's decision in the presence of all committee members, including any conditions imposed on the candidate as a result of the Examination. The chair will record the results of the Comprehensive Background Examination and submit the completed paperwork to the [Academic Services Coordinator – BME Grad.](#)

The PhD Comprehensive Background Examination is a closed-book assessment, and no aids are permitted. Recording of the examination process is not allowed, nor is the use of smart phones, video cameras, cameras, or tape recorders unless used for the purpose of the examination presentation or for accessibility accommodations.

Comprehensive Background Examination Decisions

The Advisory Committee must choose from one of the following four decisions:

- Category 1 - Passed
- Category 2 - Passed subject to completion of conditions

- Category 3 - Re-examination required
- Category 4 - Failed

Category 1 – Unconditional Pass

Category 2 - Passed subject to completion of conditions means that the Candidate's background preparation is generally adequate but certain deficiencies need to be rectified. The conditions might require the student to enroll in additional graduate courses, prepare a written report on designated aspects of the proposed research program, and/or present a public seminar on a background subject. The specific conditions of the committee must be clearly identified on the appropriate forms by the Chair, along with completion dates and the committee member(s) responsible for ensuring that the conditions will be satisfied.

Candidates who are required to complete additional requirements must satisfy the comprehensive background requirement(s) within one calendar year. Students who fail to meet these conditions will be required to withdraw. The designated committee member(s) must inform the [Academic Services Coordinator – BME Grad](#) when all conditions have been satisfied.

Category 3 - Re-examination required means that the candidate's background is deficient. Re-examination cannot take place within six weeks of the date of the first comprehensive examination but must be done before the end of the subsequent term. The re-examination date must be established by the committee and the Candidate and reported as part of the conditions. The same committee must be used for the re-examination.

Category 4 – The decision failed is only applicable to the PhD Background Comprehensive Re-examination and means that Comprehensive Examination procedure is closed, and that the candidate will be required to withdraw from the PhD program. A candidate should not receive this category on their first attempt.

Comprehensive Examination II - Research Proposal

A research proposal will consist of a double-spaced report of, typically, no more than fifty pages including tables, diagrams and references. It is suggested that the written proposal should include:

- Title page
- Table of contents
- Abstract
- Introduction / literature review
- Thesis specific objectives / hypothesis
- Proposed methods and materials
- Progress/results to date
- Timeline
- List of references

The committee must consist of the same committee members who were approved and attended the Comprehensive Background Examination. This is the student's Advisory Committee.

The research proposal must be submitted to the Advisory Committee (one copy to each member) at least two weeks before the date of the examination. The Department does not need a copy of the research proposal.

Key Points

- Must be completed by the end of the fifth term (sixth term if from an incomplete MASc)
- Comprehensive Background Exam must be successfully completed
- Exam must be booked a minimum of 3 weeks in advance
- Exam cannot be held during the [Blackout Period](#)
- Proposal must be submitted to the committee at least 2 weeks before the exam
- The EGSO will find a Chair for the Comprehensive Proposal Exam

Comprehensive Proposal Examination

The Comprehensive Proposal Examination is expected to be held in the fifth term (sixth term if from an incomplete MASc).

A *PhD Comprehensive Proposal Examination form* must be submitted to the [Academic Services Coordinator – BME Grad](#) at least three weeks prior to the desired exam date.

The Engineering Graduate Studies Office will appoint a neutral Chair for the Comprehensive Examination. The role of the Chair is to ensure that the examination is conducted according to University Comprehensive Examination guidelines. The Chair is not an examiner and cannot vote. The Advisory Committee is, in part, the same committee for the student's PhD Thesis Defence (which additionally includes an external examiner from outside of UW).

All committee members must attend the Comprehensive Proposal Examination; appointment of delegates for comprehensive proposal examinations is not allowed. Remote participation through electronic means such as teleconference or video conference is permitted. If the comprehensive background proposal examination is scheduled as hybrid, the student, supervisor(s), and the chair are not permitted to attend remotely.

Conduct of the Comprehensive Proposal Examination

For the Comprehensive Proposal Examination, the student will begin with an oral presentation on the main points of the research proposal. This should be presented within 30 minutes. The Chair will then invite members of the committee to examine the proposal. The Chair may declare a short break in the middle of the examination.

At the conclusion of the questioning period, only members of the committee are allowed to stay for the closed deliberation session following the examination. Once a consensus has been reached, the Chair will inform the student of the outcome of the comprehensive examination and of all recommendations and/or conditions imposed. The chair will record the results of the Comprehensive Proposal Examination and submit the completed paperwork to the Engineering Graduate Studies Office.

Recording of the examination process is not allowed, nor is the use of cell phones, video cameras, cameras or tape recorders unless used for the purpose of the examination presentation or if accessibility accommodation is required.

Comprehensive Proposal Examination Decisions

The Advisory Committee must choose from one of the following four decisions:

- Category 1 - Passed
- Category 2 - Passed subject to completion of conditions
- Category 3 - Re-examination required
- Category 4 - Failed

Category 1 – Unconditional Pass

Category 2 - Passed subject to completion of conditions whereby the candidate's proposal preparation is generally adequate but certain deficiencies need to be rectified.

The conditions might require the student to prepare a written report on designated aspects of the proposed research area and/or to present a public seminar on the proposal. The specific conditions of the committee must be clearly identified on Page 2 of the Report of PhD Comprehensive Proposal Examination by the Chair, along with completion dates and the committee member(s) responsible for ensuring that the conditions will be satisfied.

Candidates who are required to complete additional requirements must satisfy them within one calendar year of the exam. Students who fail to meet these conditions will be required to withdraw. The supervisor(s) must inform the Engineering Graduate Studies Office when all conditions of the Comprehensive Proposal Examination have been satisfied.

Category 3 - Re-examination required whereby the candidate's proposal is deficient. Re-examination cannot take place within six weeks after the date of the Comprehensive Proposal Examination. The re-examination must be scheduled no later than one year after the Comprehensive Proposal Examination. The re-examination date must be established by the supervisor(s) in consultation with the examiners and the candidate and reported as part of the conditions. A student who fails a re-examination will be required to withdraw from the PhD program.

Category 4 - Failed whereby the proposal examination procedure is closed and the candidate will be required to withdraw from the PhD program. Students who fail the re-examination must withdraw from the PhD program.

The Chair must inform the student, in the presence of the Advisory Committee, of the outcome of the Comprehensive Proposal Examination and of all recommendations and/or conditions imposed.

Time of Examination

The Comprehensive Background and Proposal Examinations will be conducted before the end of the third and fifth terms of registration respectively.



Students requiring an extension, due to extenuating circumstances, will need to complete the *PhD Comprehensive Examination Time Limit Extension Request* webform. Student's will receive an email with a link to complete the webform if they need to complete this. The form must be submitted for approval to delay a Comprehensive Examination in addition to a written request outlining the reasons for the delay and a timetable for the completion of the comprehensive examination, the research program and the thesis defence. The request must be supported in writing by the student's supervisor(s) and the Director of Biomedical Engineering Graduate Program.