

Memorial University

Department of Mathematics and Statistics

Graduate studies guidelines

Procedures and regulations governing the Ph.D. comprehensive examinations

Approved January 10, 2018

1 The Ph.D. comprehensive examination

The comprehensive examination is in two parts, the *qualifying review* and the *intermediate review*, in which the candidate must demonstrate both a broad knowledge of the academic discipline, and an advanced scholarship in at least one specific field of study. Students should be notified, in writing, of the dates and times of both their qualifying review and intermediate review at least three months in advance. For the qualifying review, notifications will be issued in May and September for examinations in August and December, respectively. It is the responsibility of the supervisor(s) to request the formation of the examination committee and provide the student with a copy of comprehensive examinations guideline (this document). It is prerogative of the head of the department to nominate the examination committee members and a responsibility of the graduate officer to seek the approval of such a committee by the dean of graduate studies.

1.1 Part I. The qualifying review

The qualifying review, which consists of three written exams, should occur within one year of a student entering the Ph.D. programme. It is normally held in the last week of August, for students who enrolled in the programme in the Fall term, and the first week of December for students who enrolled in the programme in either the Winter or Spring terms. The main purpose of the qualifying review is to ensure that the candidate has a reasonably broad general knowledge of the discipline at the honours undergraduate level before beginning work on a thesis.

The examination committee for the qualifying review consists of the head of department or delegate (usually the graduate officer) who serves as chair, the candidate's supervisor and three examiners, all of whom serve as voting members. The examiners are chosen from the faculty members whose research areas are close to the subjects of the exams. At this stage, the examiners shall not be members of the supervisory committee. Once the examination committee has been approved by the dean of graduate studies, the candidate shall not contact the examiners with matters pertinent to the exam; questions raised by the candidate shall be addressed to either the supervisor or the chair of the committee.

The qualifying review in **mathematics** consists of three examinations chosen by the supervisory committee from the following list: *analysis, topology, algebra, combinatorics, differential equations, and numerical analysis.*

The qualifying review in **statistics** consists of the three examinations in the following list: *probability, inference, and applications of statistics.*

The syllabi for these examinations together with two sets of sample exams must be posted in the department's web-site. Each exam will be written in a session of three hours and all of them must be completed in the span of a week. Grading the exams by the examiners should be done within a period of two weeks.

The outcome of each exam is pass (a grade of A or B), fail (F), or re-examination (a grade of C or D). Only one re-examination in at most two exams is possible and, when needed, such a re-examination(s) should occur no sooner than one month and no more than four months after the original examination. When two exams need to be rewritten, the exams must be completed in the span of a week. To successfully complete the qualifying review, a student must pass all three exams. In the case of failure, the student's programme shall be immediately terminated.

On receiving the results from the examiners, the chair consults with the full committee and then informs the head of the department of the outcome of the examination. If the candidate fails to successfully complete the qualifying review, the department notifies the dean of graduate studies. If the candidate needs to be re-examined, the committee recommends when the exam(s) to be re-written should be scheduled. If the candidate successfully completes the qualifying review, the chair of the committee communicates the grades obtained by the student to the department secretary to be recorded in the student's file (these grades will be used later to determine eligibility for pass with distinction at the second part of the comprehensive exam) and informs the student of the outcome. If the student does not fail the qualifying review, the School of Graduate Studies will only be notified when the dean requests it.

All written examination scripts must be given to the department secretary for safekeeping until one year after the student leaves the programme. After this time, the scripts can be destroyed.

1.2 Part II. The intermediate review

The intermediate review is an examination process that starts with the submission of a written proposal on a thesis research topic by the candidate and culminates with the oral examination. At the time of this oral examination, the student shall have satisfactorily completed the course work listed in his/her programme of study up to the date. As the final stage of the Ph.D. comprehensive exam, the intermediate review must take place before the end of the candidate's seventh semester (normally towards the end of the student's sixth semester). The purpose of the intermediate review is to ensure that the candidate has sufficient specialised knowledge in the area of the proposed thesis and related areas so as to make a Ph.D. worthy thesis likely.

The examination committee is appointed by the dean of graduate studies upon recommendation of the head of the department. It consists of the head of department or delegate (usually the graduate officer) who acts as chair, the candidate's supervisor(s), the dean of graduate studies delegate and three examiners who meet the criteria indicated in the Graduate Studies regulations. In the case of more than one supervisor, only one shall be voting member; all the other members except the dean of graduate studies delegate are voting members.

The thesis proposal is a piece of scholarly work written by the candidate under the guidance of the supervisor(s). It shall be submitted for the consideration of the examination committee at least three

weeks before the date of the oral examination. Its length should not exceed 12 pages plus bibliography. The examiners have the right to reject any proposal that does not meet these requirements. Although there is not a fixed format for such a proposal, it should at least contain a motivation to the work and its worthiness, a succinct review of the literature, an account of the current stage of progress and further directions of the student's research, a clear description of the expected contribution to knowledge, and a time frame for completion. This proposal is subject to all university regulations regarding academic integrity and intellectual property.

The oral examination consists of a presentation of the thesis proposal in a 45 min seminar-like format by the candidate, followed by at least two rounds of questioning by the examiners. These parts of the exam are open to the public. During the presentation, the candidate is expected to summarise the work in the chosen topic to date and to indicate the directions of his/her research for the remainder of the programme. The oral examination should consist of questions relevant to the proposal and related areas. Specifically, it is appropriate to ask questions that may not look directly related to the proposal if these questions probe the student's depth of knowledge in his/her chosen field. After the examiners finish questioning the candidate, the other members of the examination committee are given the opportunity to comment on the oral presentation. Then, the examination committee proceeds to an in camera deliberation where a decision is made based on the overall performance of the candidate, i.e., the evaluation considers the thesis proposal, oral presentation and viva voce. The possible outcomes of the examination are pass with distinction, pass, re-examination or fail. In order to be eligible for pass with distinction, the candidate must have obtained A in all written exams from the qualifying review on the first attempt. Fail and pass with distinction shall be unanimous decisions. In case of re-examination, the examiners should provide written feedback to the candidate within one week from the date of the oral examination and the re-examination must be held not less than one month and not more than six months after the original examination date. In the case of re-examination, the candidate shall re-submit an updated thesis proposal at least three weeks before the exam. The only possible outcomes in a re-examination are pass or fail. Only one re-examination is permitted. When the outcome is fail, the candidate's programme shall be immediately terminated. Whatever is the outcome of the intermediary review, the chair of the examination committee shall submit the comprehensive examination report signed by the committee members to the dean of graduate studies with copy to the department head and supervisory committee.

When examining a candidate with disabilities who requests accommodations, these shall be arranged according to university policies.