Comprehensive Examinations
Policy for the Department of Mining Engineering

modified

November 28, 2022

Department of Mining Engineering Ph.D. Comprehensive Examination Policy

Purpose

Ph.D. graduates in the Department of Mining Engineering are expected to possess a sufficient breadth of knowledge to be able to understand and propose solutions to a variety of problems in mining engineering that may be faced during their academic studies and in their research efforts. Furthermore, Ph.D. candidates within their programs must demonstrate that their research approach is sound and original, and that their background preparation is sufficient to define the research problem and propose solutions.

To accomplish these goals, two levels of comprehensive examinations have been required in the past to test a candidate's general knowledge in a variety of mining engineering fields and to evaluate the candidate's preparation for their specific field of research.   In the current and future academic sessions, a first level comprehensive examination will no longer be mandatory for Ph.D. candidates in Mining Engineering unless they are deemed to lack satisfactory undergraduate or graduate training at recognized institutions in various fields of mining engineering specialization, as assessed by the student's supervisory committee. For candidates possessing appropriate undergraduate or Master's level training prior to entering into the Mining Engineering Ph.D. program at Queen's, no initial comprehensive examination will be required. For such students, only one comprehensive examination ("final level comprehensive") must therefore be satisfied before they will be permitted to proceed to a thesis defense.

Previously, the initial comprehensive examination was designed to assess a candidate in areas close to their field of specialization as well as in broader areas outside their field within the general framework of mining engineering study. The preliminary examination was therefore designed to assess the candidate's background knowledge in the area of specialization, their understanding of basic principles in other technical areas and their ability to solve problems on the basis of basic principles. The second level comprehensive exam is, however, designed to assess a student's performance and ability to complete a final defense of their topic of research, and is therefore mandatory.

Graduate Program Content

Within the Department of Mining Engineering, the primary areas of study are Mining and Mineral Processing. Within both areas of study, fields of specialization may consist of:

> **Mining**
> • Rock Mechanics
> • Explosives Technology, Blasting and Drilling
> •Ventilation and Environmental Control
> • Ore Estimation, Grade Control and Mine Planning
> • Open Pit Mining
> • Underground Mining
> • Management and Financial Assessment

Mineral Processing
• Unit Operations
• Flotation
• Flowsheet Design
• Reaction Kinetics
• Metals Extraction by Leaching

Procedures

Upon a Ph.D. student's arrival at the University and within the Department of Mining Engineering, a candidate's background will be assessed by a committee consisting of the Coordinator of Graduate Studies, the student's designated supervisory committee and the Head of the Mining Engineering Department.

The committee may recommend that:

• the student not be required to take a general knowledge examination (completely or in part) if the student's record reveals sufficient background in mining or other relevant disciplines of engineering; such students will be required only to complete a final level comprehensive examination before a thesis defense can be scheduled; or

• the student may be required to take a designated program of study or general knowledge examinations to familiarize them with various fields of mining engineering if the student's record reveals insufficient background in mining or other relevant disciplines of engineering. Examples of relevant background experience that would preclude a student having to take a designated program of first level comprehensive study would include completion of studies in civil engineering (such as foundation analysis, soil mechanics, earth structures), geological engineering (such as geomechanics, structural analysis, mineral economics, mineralogy), and chemical engineering (such as process control, chemical reaction systems). All indicated extra-departmental studies that have been identified provide knowledge pertinent to primary areas of mining engineering graduate research, these being rock mechanics, explosives, mine environment/mine ventilation, mineral economics and mineral processing design.

Should this path be recommended, the areas of study or examination will be selected by the candidate, their supervisor(s) and the Coordinator of Graduate Studies, with focus being placed upon mining engineering topic areas previously specified. This process must begin immediately after the assessment of the student's background upon initial entry into the Mining Engineering program.

For a final level comprehensive examination leading up to a thesis defense, the candidate will be required to provide a written progress report of their research progress and an oral summary presentation of the report to the Graduate Coordinator, who will then distribute the report to a committee of examiners for review at least 15 days prior to a formal oral presentation (examination). The report must include sufficient detail for review by a designated committee and should not exceed 30 pages in length. The examining committee will consist of:

- the student's Supervisor(s)

- the Department Head (or Delegate)

- a Departmental Examiner

- the Coordinator of Graduate Studies (who will be the Chair and non-voting Committee member)

The examination will cover the area of specialization and the areas of the candidate's background preparation. The exam duration will be no more than 2 hours (comprising a 30 minute long presentation and 90 minutes of questioning). All the requirements for the comprehensive exam should be completed no later than 24 months after a student's initial registration in the Ph.D. program. The examination will be scheduled by the Coordinator, in consultation with the examining committee and the candidate, after the candidate has informed the coordinator in writing about their intent to have the exam.

Result of the Final Level Examination

The procedure for conducting this examination will be similar to that of an actual thesis defense. Upon completion of the oral presentation the student will be required to withdraw from the examination room and the examining committee will discuss and assess the candidate's performance. The supervisor(s), Head and Examiner have one vote each (total of three votes) while the Graduate Coordinator (or delegate) does not vote. The result will be either a pass or fail with the understanding that, in either case, recommendations will be given to the student within three days after completion of the oral presentation. The student will be informed of the Committee's decision by the Graduate Coordinator, and both the supervisor and Graduate Coordinator will provide a one-page summary report of the Committee's conclusions to the student. Failure in this final level examination will require that the student be given a second and final opportunity 6 months after the first examination to complete a second oral presentation. Failure for the second time will require that the student withdraw from the program on academic grounds.

Appeal

The student can appeal the result of any final level comprehensive examination no later than two weeks after receiving the results of the examination by issuing a letter to the Graduate Coordinator and/or the Department Head. The review committee (examiner(s), Department Head and Graduate Coordinator) will then meet, discuss the appeal and inform the student in writing of the appeal decision. The student, if not satisfied, can proceed with appeals to the other University bodies as described in Section 8.9 of the Calendar of the School of Graduate Studies and Research.