

# PhD Comprehensive Examination Guidelines

## Department of Chemistry, University of Saskatchewan

PhD students (including students transferring from the MSc program) must complete a PhD Comprehensive Examination within 40 months of starting the graduate program. For the majority of students, this means that the exam will be completed within the first term of the fourth year of the graduate program. Exceptions to this will be granted only under the most extenuating of circumstances through consultation with the Chair of the Graduate Affairs Committee.

The objective of the examination is for the student to demonstrate the ability to read critically, work independently, and present information and ideas in a suitable manner. **The student must prepare a “mini-review” on an important topic from recent literature, and present a formal seminar based on that review, including a suggestion for further research.** The topic should not be an aspect of the student’s current or past thesis research, but rather should be a new direction (but within the student’s general area of expertise); it should encompass reasonable body of research (typically ca. 20 primary references) and be clearly distinct from any existing review.

The topic selected for the examination must be approved by the AC. To seek approval, the student should submit a *Proposal* for each of up to three different topics to the graduate secretary. To facilitate evaluation of the topic(s), the proposal(s) should be sufficiently detailed to define the boundaries of the mini-review(s) and should include: i) some key background references including any relevant previous reviews; ii) where applicable, a clear statement on how the proposed review will be distinct from any relevant existing review; iii) at least the majority of the primary references (all citations should include titles). The proposal will be distributed to the AC and GAC Chair for adjudication. If the student fails to propose a topic that meets the approval of the committee, the committee can assign a topic to the student.

**The student is expected to work independently.** Faculty members should not provide input on the written report or presentation prior to the conclusion of PhD Comprehensive Examination process. Students are encouraged to consult with their supervisor and AC when considering possible topics and preparing the proposal, but should work entirely independently once the topic has been approved.

The student must submit a written report a minimum of one week before the examination is scheduled. The report should be approximately 15,000-25,000 characters in length (not counting citations) and should adhere to the formatting rules (i.e., ‘Instructions for Authors’) of any reputable chemistry journal (the journal selected for formatting rules should be specified in the report; regardless of this selection, text must be at least 10 pt font). An excellent and recommended example is the instructions for mini-reviews for *Angewandte Chemie* ([http://onlinelibrary.wiley.com/journal/10.1002/\(ISSN\)1521-3773/homepage](http://onlinelibrary.wiley.com/journal/10.1002/(ISSN)1521-3773/homepage)). The report must contain a section entitled ‘*Suggestions for further research*’ of at least one page in length. In this section, a **clearly defined** scientific question(s) must be posed that would extend the current research along with a justification of why the proposed new direction(s) is(are) important and a **brief but clear** description of how the question(s) would be addressed experimentally (or computationally). The student must submit the report (one paper and one electronic copy) to the graduate secretary before the established deadline. Paper copies will be distributed to the AC and an electronic copy to all faculty in the Department.

Approximately one to two weeks after submitting the report, the student will present a seminar on their mini-review. **This will be a formal seminar, expected to be about 30 minutes in length.** All members of the department may attend and ask questions of the student. The student will be evaluated based on the report, the seminar, the ‘*suggestions for further research*’, and their ability to answer questions on the topic. All faculty will be invited to submit written comments on the report to the AC Chair; comments should be received prior to presentation of the seminar. At the conclusion of the question period there will be a brief meeting of all faculty in attendance to determine the outcome. A report on this meeting (prepared by the AC Chair) will be circulated to the AC and the student. A ‘pass’ recommendation will be circulated to all faculty for ratification under the ‘48 hour rule’. If the committee believes that the standard expected of a PhD candidate has not been met, the student may be asked to correct specific deficiencies identified in up to two of the evaluation components (i.e., written report, ‘*suggestions for further research*’, seminar, and defense) (generally within 2 weeks). Significant deficiencies will result in a ‘fail’ recommendation (also to be ratified under the ‘48 hour rule’). A failed examination may be repeated once, with the permission of the Dean of the CGPS. The AC may ask the student to take on the same topic, or it may request (or assign) a new topic from the student. A second failure will result in the student being required to discontinue from the program. This failure may be appealed to the Ph.D. Committee of the CGPS on substantive or procedural grounds.

For further information, please contact the Chair of the Graduate Affairs Committee.

## PhD Comprehensive Examination (summary of procedures)

The student must prepare a written 'mini-review' of an important topic from the recent literature and present a formal seminar based on that review including suggestions for further research. The student is encouraged to consult with their supervisor (or any faculty member) on topic selection and when preparing the proposal(s) for their topic(s); however, all such consultations are limited to suggestions of possible topics and constructive criticism and editorial advice during preparation of the topic proposal(s). Preparation of the report and seminar must be done by the student independently.

### Topic:

- A written proposal for the topic must be submitted to and approved by the Advisory Committee.
- The topic should be a new direction for the student (i.e., not be an aspect of the student's past or current research but within the general area of expertise).
  - 'new direction' implies that primary references are unlikely to appear among the list of references in the student's thesis or publications (future or former) or those of the student's research group (past or present)
- The scope of the topic should be clearly defined and represent a reasonable body of work from several research groups. In general, ca. 20 primary references can define a suitable topic; however, this number can vary widely as it is the **amount of research reviewed** that is important.
  - 'primary references' refer to those papers whose results/conclusions are actually summarized in the review
- The topic must be clearly distinct from existing relevant reviews, if any.
  - "To be clearly **distinct** from an existing review", means "there room for the student to prepare an independent critical review of a defined research area". It would be inappropriate if the review were to simply add examples to an existing review(s) or would be largely adapted from an existing review. However, if the existing review(s) are dated, not comprehensive, or are insubstantial, then there MAY be room for the student to prepare a unique and critical review. It is up to the student to reduce that possibility into a reality.

Failure to meet the above criteria can result in failure of the examination. The responsibility to meet the criteria lies primarily with the student. Approval of the topic by the Advisory Committee does not imply a waiver of any of these criteria.

Students are advised to select 'smaller' topics with well-defined boundaries and to avoid those that are 'larger' (e.g., > 40 primary references), general, or often reviewed.

### Report:

- should be 15,000-25,000 characters (not counting references) written according to the formatting instructions of any reputable chemistry journal (e.g., *Angewandte Chemie International Edition*).
- paper and electronic copies must be submitted to the graduate secretary before the established deadline and at least one week prior to the seminar
- **must** include 'Suggestions for further research' (i.e., a clearly defined scientific question(s) and a brief but clear description of how this(these) question(s) would be addressed)

### Seminar:

- ca. 30 minutes in length followed by a question period (normally 60-90 minutes)
- all members of the Department may attend
- two rounds of questions: the 1<sup>st</sup> round will be 'in public' with questions mainly relating to material presented in the seminar: the 2<sup>nd</sup> round will be *in camera* (student, AC members, and other faculty only) with questions on any aspect of the report or seminar.

### Evaluation:

- Based on the report, the 'suggestions for further research', the seminar, and the ability to answer relevant questions, the Advisory Committee submits a pass/fail recommendation to the Department for approval. In the event of a failing grade, the examination may be repeated once.