

# Analytical, Inorganic and Physical Chemistry Comprehensive–Oral Format (June, 2015)

## Timing

At least 3 months in advance of the oral component of the exam:

- a) The exam committee shall be formed,
- b) The date and time of the oral exam shall be set,
- c) The student shall be notified of the nature, scope, date and time of the exam, as well as a timeline for the examination process.

## Examination Committee

The examination committee shall consist of:

- The Head or delegate, who is also the chair of the committee
- Four members of the department including the supervisor or co-supervisors
- A non-examining member designated by the Dean of Graduate Studies

## Written Component

During the two weeks following notification of the date and time of the student's oral comprehensive exam, the student shall consult with their research supervisor regarding preparation of their written report. The student shall submit electronically a ½ to 1 page summary of their PhD research area (including research to-date if any) with at least three key primary references to the Graduate Secretary, who will circulate this summary to the committee members.

Seven weeks following the notification (or earlier), the student must submit a written report (maximum 15 pages including title page, figures, tables and references) on an area related to their PhD research to the Graduate Secretary. The subject of the report will be decided upon by the candidate and their supervisor. The report should be subdivided into the following sections:

- Introduction and Literature Review (approx. 11 to 13 pages)
- References/Bibliography (1 or 2 pages)

The student should keep in mind that they should provide a critical assessment of the work they reference. Note that the major portion of this work rests in the review of literature. The student may *briefly* discuss their own data (if any) and place it in context of its relationship to the scientific literature, but note that this should not be the majority of the discussion. References must be in a consistent academic format.

Links will be provided on the chemistry department comprehensive website directing students to sites that discuss plagiarism as well as university policy on proper *Academic Behaviour* and

*Academic Misconduct* (see the current University Calendar). It will be expected that students are familiar with this information and that none of their work be plagiarized. The penalties for plagiarism and other academic offences may include failure of the comprehensive or termination of the student's program.

The written report should conform to the following:

- A title page including only the title of the report, the student's name, student number, date of oral exam and committee members to whom it is submitted,
- 21.6 × 27.9 cm page size with minimum 1.9 cm margins (8.5 × 11 inches with minimum 0.75 inch margins),
- 12 point - Times New Roman font (or equivalent),
- double-spaced, except references, tables and figure captions,
- include section headings under the direction of the research supervisor

An electronic copy should be submitted to the Graduate Secretary no later than the date specified in the letter notifying the student of their comprehensive exam, which will be no less than 7 weeks following receipt of the letter. The Graduate Secretary will acknowledge receipt of the file and will then distribute the written component to each member of the examination committee as well as the Deputy Head (Graduate Studies and Research). If the student does not receive a response from the Graduate Secretary, it is their responsibility to ensure that the e-mail has not gone astray.

## **Oral Component**

The oral exam will consist of

- a 15 minute oral presentation summarizing the written report
- at least two rounds of questioning from the five examiners with the student's supervisor or co-supervisors being the last to question in each of the rounds

The examination committee should use the student's written report as a starting point for questions. However, the examination committee is also expected to explore the student's general and fundamental understanding of chemistry at the undergraduate level as well as a higher level of understanding in the student's area(s) of specialization (to be specified in the letter).

The oral exam is limited to 3 hours, including the 15 minute oral presentation and a 5-15 minute break between rounds of questioning.

## **Evaluation**

Each examiner shall evaluate the written component of the examination and submit a grade (pass with distinction, pass, re-examination or fail) to the Chair of the committee following the oral examination. The criteria for each of these outcomes are indicated in the current University Calendar (Section 4.8.2 in the 2015/2016 Calendar).

The examiners will submit questions (minimum of three) to the Chair of the committee at least two working days before the oral examination. A copy of the compiled questions will be provided to each examiner prior to the beginning of the examination. Each examiner shall record a grade and comments on the student's answer to each of these questions, as well as any follow-up questions.

The committee will meet immediately following the oral examination to decide on a grade of **pass with distinction, pass, re-examination** or **fail**. Pass with distinction and fail require unanimous decisions of the committee. Pass and re-examination require a simple majority. To pass the comprehensive examination, the student is expected to pass both the oral and written components. To pass with distinction, this rank must be achieved on both the written and oral components. The Chair of the examination committee will submit a memo reporting the outcome of the examination along with a copy of the questions provided by the examiners to the Graduate Secretary within 24 hours of the completion of the examination. In accordance with SGS guidelines, the student will be informed of the outcome of the examination in writing from SGS.

If the student receives a grade of re-examination, the student will be permitted one further attempt. The student's supervisor, in consultation with the student and the examination committee, will set a date for the re-examination. The date for the re-examination will be at least one month, but no later than 6 months after the first oral examination. Upon re-examination, the committee decides on a grade of pass or fail by simple majority. Pass with distinction or re-examination are not possible.

## Appendix I - Example time line

For an oral comprehensive examination on Friday August 28<sup>th</sup>:

- at least one week prior to Friday May 29<sup>st</sup> – the supervisor informs the Deputy Head (Graduate Studies and Research) of the proposed oral examination date and the proposed composition of the committee, with their approval,
- on or before Friday May 29<sup>s\*†</sup> – the student must receive a letter indicating the date of the oral examination as well as the rest of this time line including when the student must hand in their summary and final version of their written report. The letter should also include a list of undergraduate chemistry text books and area of specialization of which the student should show a higher level of comprehension,
- Friday July 17<sup>th</sup> – written report submitted to Graduate Secretary and a copy provided to all exam committee members and the Deputy Head (Graduate Studies and Research),
- Wednesday August 26<sup>th</sup> – examiners submit 2-3 questions to the Chair of the examination committee,
- Friday August 28<sup>th</sup> – oral exam, assignment of overall grade.

\*The student must be informed of the date of the comprehensive examination at least three months prior to the date of the oral examination. As there may be some delays in receiving an official letter, notification from the supervisor or deputy-head by email is acceptable, provided the timeline is provided. The student should not be informed of the composition of the examination committee at this time. A copy of this email, with the student's acknowledgement of receipt should be forwarded to the Graduate Secretary and Deputy Head (Graduate Studies and Research).

## Appendix II - Example Letter from the Chair of the Committee to the Student

Dear \_\_\_\_\_,

Your comprehensive examination for the Ph.D. degree will be held on Friday August 28<sup>th</sup>, 2015 at 9:30 am in a room to be decided. This will be an oral examination in which you will be expected to demonstrate a mastery of inorganic chemistry in general and the principles of chemistry related to your research focus at a higher level. Examples of textbooks that you should use to broadly review inorganic chemistry are:

Inorganic Chemistry, Shriver & Atkins, 4<sup>th</sup> or 5<sup>th</sup> Ed. 2006 or 2010

Inorganic Chemistry, Miessler & Tarr, 3<sup>rd</sup> Ed. 2004. (2<sup>nd</sup> edition in library, QD 151.2 M54 1999)

The following text provides a suitable coverage of Green Chemistry:

Mike Lancaster, Green chemistry. An introductory text, 2<sup>nd</sup> edition, 2010, RSC Publishing

There is also a written component to your exam in the form of a report, the content of which will be agreed upon by you and your supervisor. By 3:00 pm on July 17<sup>th</sup>, 2015 you will submit to the Graduate Secretary an electronic copy of your paper, which is a maximum of 15 pages long. This should include a title page, figures, tables and references. The paper should be concise and precise, and conform to the following guidelines:

- A title page including only the title of the report, the student's name, student number, date of oral exam and committee members to whom it is submitted.
- 21.6 x 27.9 cm page size with 1.9 cm margins (8.5 x 11 inches with 0.75 inch margins)
- 12 point - Times New Roman font (or equivalent)
- double spaced, except references, tables and figure captions

Note also that the inclusion of figures and tables should make a point clear, not simply take up space, and these should be included in the text of your paper.

On the chemistry department website, there are links to guidelines which discuss avoiding the very serious consequences of academic dishonesty and plagiarism. You are expected to have read and fully understand these guidelines including the University policy on proper Academic Behaviour (see the appropriate section in the current University Calendar). If you have questions, please contact your supervisor or the chair of your examination committee.

Your examination will begin with a 15 minute presentation that summarizes your written paper and expands upon items in your paper that might benefit from oral clarification. Following your presentation, the examination committee will have at least two rounds of questioning separated by a 5 -15 minute break if required. Please contact me if you require any clarification.

Your examination committee consists of:

- Dr. Robert Davis, Chair of the Examination Committee
- Dr. Francesca Kerton, Supervisor
- Dr. Mike Katz
- Dr. Christopher Rowley
- Dr. Sunil Pansare

Sincerely Yours,

Dr. Christina Bottaro  
Deputy Head Graduate Studies and Research