

# Procedures for the Written & Oral Qualifying Examinations

Department of Chemistry  
University of California Riverside  
September 2017

## 1. Purpose and Expectations

Every graduate student in Chemistry must demonstrate proficiency in his/her dissertation research area, the ability to independently develop an original research topic, the ability to express these ideas using concise scientific writing, and the ability to communicate and defend these ideas effectively orally. Proficiency is assessed through the Qualifying Exams, and advancing to candidacy requires passing both the oral and written components of the exam. See also the *Requirements for the M.S. and Ph.D. Degrees* document for more details.

## 2. Written Exam Structure and Content

The exam consists of two written research proposals. The first proposal should describe ***an original research idea*** developed independently by the student that lies ***within the student's sub-discipline of chemistry*** (e.g. analytical, inorganic, organic, or physical chemistry) but which is outside the scope of the student's dissertation research. The ***topic should differ appreciably from any research the student has performed previously or research that might reasonably be performed in the student's research group***. The student is not expected to generate any preliminary research data for this proposal beyond what can be found in the existing literature.

The second proposal focuses on the ***student's dissertation research***. The document should include research progress to date, but it should be ***written as a research proposal with a significant emphasis on the larger context and future work, rather than as a progress report***.

A good proposal will describe:

- ***Specific Aims***: What are your broad, long-term goals? What ***specific hypothesis*** will be tested?
- ***Significance***: What is the state of existing knowledge, and what gap(s) will your project fill? What impact will your project have on the field if successful?
- ***Innovation***: What makes your proposed project innovative in the field? How does it differ from current research?
- ***Approach***: Describe the experimental design/analyses that will be used to achieve your specific aims. What are your expected results? What potential difficulties or limitations do you anticipate, and how might these be overcome?

The student ***must consult the Chair of the Qualifying Exam Committee regarding the appropriateness of the original research proposal topic***. The student may also consult the Committee Chair about general aspects of the exam such as exam structure, etc. ***The student shall not consult other faculty about the scientific content of the original research proposal. The dissertation proposal document should be prepared without scientific feedback from the dissertation advisor or other faculty.***

## **2.1. Format of the Written Proposals**

Each proposal should not exceed **five pages** (including all figures and tables) using **1-inch margins, single spacing, and 12-point font**. The bibliography does not count against the page limit. Both proposals must be completely standalone and will be evaluated directly on their merits.

## **3. Oral Exam Structure and Content**

The oral exam consists of the presentation and defense of each of the two proposals developed for the written exam. The first half of the oral exam will focus on the original research idea, and the second half on the student's dissertation research. Each half will last approximately 1-1.5 hours.

Like the written proposals, the student should take care to highlight the specific aim(s) (including a testable hypothesis) of the research, the significance of the research, the scientific innovation, and the approach to be used. **Both presentations should be structured as a research proposal, not as a standard seminar or group meeting talk.** Students should include research progress to date, but discussion of the larger context of the project and future research plans that will comprise the dissertation are major components.

The student may consult the Chair of the Qualifying Exam Committee regarding the exam structure, appropriate proposal topics, etc. **The student shall not consult other faculty about the scientific content of the original research proposal. The dissertation proposal presentation should be prepared without scientific feedback from the dissertation advisor or other faculty.**

### **3.1 Format of the Oral Presentation**

Unless specified otherwise by the student's sub-discipline (see Section 3.2), the student should prepare **a brief Powerpoint-style presentation (~15 minutes) for each proposal** to assist in the presentation. Students should think carefully about how to present their key results and proposed research concisely, avoiding the use of excessive numbers of slides. Students should be prepared to answer questions at any time before, during, or after the presentation. The slides may be used to help organize the presentation and to show data or complicated schemes. However, Powerpoint slides may not be used as a substitute for the student's own knowledge. Students must be familiar with the details of anything presented on a slide, and the committee may instruct the student to explain such details without referring to the slide(s) at any time.

The student should be prepared to cut his/her presentation short to select the most relevant information as needed if the exam is running late.

## **4. Exam Administration**

**The written and oral Qualifying Exams should be taken before the end of the student's second year in the Ph.D. program**, typically during the Spring quarter. Faculty are not expected to be available to hold the exam during the summer months.

It is the student's responsibility, with guidance from the dissertation advisor, to **secure an outside member for the Qualifying Exam committee 2-3 months before the intended exam date**. The outside member may neither be a faculty member in the Chemistry department nor have a cooperating faculty member appointment in Chemistry.

**Six to eight weeks before the desired exam date, the student should arrange a date and time for the exam with the committee members.** Once the exam has been scheduled, the student should reserve a room for the exam. **The student must notify the Graduate Affairs Officer of the exam date, time, and location in writing at least three weeks prior to the exam date.** This is essential to ensure proper approvals can be obtained from the Graduate Division. **If Graduate Division approval has not obtained before the start of the exam, the exam cannot occur. In that event, the exam will be canceled and will have to be rescheduled for a future date.**

**The student must obtain approval for the original research proposal topic from the Chair of the Qualifying Exam Committee as soon as possible (2-3 months and before the oral Qualifying Exam) and before preparing any documents for the Qualifying Exam.** The Qualifying Exam Committee Chair, in consultation with other Qualifying Exam Committee members as needed, has the discretion to decide whether the original research proposal topic is appropriate and distinct from the student's own dissertation research area. **Failure to obtain said approval is sufficient grounds for failing the student on the exam.**

**At least one week prior to the oral Qualifying Exam date digital copies of the final written proposals must be emailed to:**

- 1) All members of the Qualifying Exam Committee.
- 2) The Chemistry department Graduate Student Affairs Officer, who will add it to the student's file for record keeping purposes.

**Ask the committee members if they would also like a paper copy of the proposals,** and if so, provide it to them at the same time as the electronic copy.

These student obligations prior to the exam are summarized in the attached checklist. **It is the student's responsibility to ensure that all tasks and deadlines are met.**

The exam has two segments, written and oral. The Committee chair will direct the exam. First, the student will be asked to step outside the room while the committee evaluates the written proposal documents on a pass/fail basis. Then the oral exam will commence. The oral exam will begin with the student presenting his/her original research proposal. The committee may ask questions at any time. Once the first half of the oral exam has been completed, the committee will ask the student to step out of the room while they briefly discuss the student's performance. Then the second half of the oral exam on the student's dissertation research will commence in the same format. **Both the original research topic and dissertation proposal portions of the oral exam must be conducted, regardless of the outcome of the first half.** One purpose of the committee is to provide valuable feedback on the status and future prospects for the thesis research

The committee may ask questions which test the student's knowledge of the general field as well as the related fields and areas of special interest. The advisor may ask questions, but he/she is strongly discouraged from answering any questions posed by the committee or otherwise intervening during the exam (even if the student's answers grossly misrepresent the advisor's research). The student should demonstrate communication skills, independent thinking, and scientific knowledge that would be expected for a Ph.D candidate

## **5. Evaluation, Reporting of Results, and Feedback policy.**

The dissertation research proposal will be evaluated based on the student's demonstrated understanding of the research area, the ability to explain the research objectives clearly in the context of the field, the research progress to date, and the longer-term research plan. The original research proposal will be judged on the student's ability to select and develop an independent research topic, to

explain how the research proposal relates to and will advance the current status of the field, and to provide a plausible strategy for carrying out the research. A critical analysis of the state of the art of the chosen field will also be expected.

The written proposals must demonstrate a level of writing ability, scientific knowledge, and creative thought commensurate with a student seeking to earn a Ph.D. ***If the student fails the written examination, the committee should provide written comments on the Written Examination evaluation form as to what steps/revisions will be needed for the student pass.*** Also establish and indicate the time line for submitting the revised document(s).

The written & oral exams are evaluated during the deliberations at the Qualifying Exam. ***The oral and written exams are each graded separately on a Pass/Fail basis.*** If there is an initial divided vote among the committee, the committee should make every effort to arrive at unanimity. Failing unanimity, a committee report which contains only one negative vote will be deemed a pass, and a committee report which contains two or more negative votes will be considered a failure.

The only criteria for determining if the student has passed or failed the oral and written exams are the student's performance during the oral exam and the quality of the written proposals. Note that ***failure to adhere to the exam guidelines specified here provides sufficient grounds for failing the student on the relevant portion(s) of the Qualifying Exam.*** The student may request additional feedback regarding the student's performance from the Chair and other members of the Qualifying Exam Committee.

Formal notification of the oral and written exam results will be shared verbally with the student at the end of the oral exam. Written records will be sent to the Chemistry department and the Graduate Division. If the student does not pass the written exam, the Committee Chair will provide written comments explaining this decision to the Graduate Student Affairs Officer.

## **6. Retake Policy**

If the student does not pass the written or oral Qualifying Exam components, the Qualifying Exam Committee may allow the student one additional opportunity to repeat the exam. If the Committee allows the student a second attempt, the Committee will decide which components (oral and/or written, and original research and/or dissertation proposal) need to be repeated and will establish an appropriate time line for the re-examination. ***A retake of the written exam should occur as soon as practicable, and it must be completed no more than 6 months after the original Qualifying Exam date. A retake of the oral exam cannot occur until at least 3 months have elapsed since the original exam. It must be completed within 6 months after the original Qualifying Exam date.*** A student whose performance on the second try is also unsatisfactory or who does not undertake a second examination within six months of the first examination is subject to academic disqualification. A third examination is not permitted.

## Student Checklist for the Oral and Written Qualifying Examinations

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- \_\_\_\_\_ **At least 2-3 months in advance:** Obtain approval for your original research topic from the Chair of your Qualifying Examination committee (not your research advisor).
- \_\_\_\_\_ **2-3 months in advance:** Secure an outside faculty member to serve on the committee.
- \_\_\_\_\_ **6-8 weeks in advance:** Schedule an exam date & time with your exam committee. **Formally notify your committee members of the final date/time as soon as possible.**
- \_\_\_\_\_ Reserve a room for the exam (through Barbara Outzen) as soon as the exam date is set.
- \_\_\_\_\_ **At least 3 weeks before the exam date:** Notify Christina Youhas of your exam date, time, & location so that she can obtain Graduate Division approval for your Qualifying Exam.
- \_\_\_\_\_ Prepare your written research proposal in accordance with the instructions found in Section 2 of this *Procedures for the Oral & Written Qualifying Examinations* document.
- \_\_\_\_\_ **At least 1 week before the exam date:** Email digital copies of your two written proposals to your committee members and to Christina. Ask your committee members if they also want a paper copy, and if so, provide that as well.
- \_\_\_\_\_ Prepare your presentation slides in accordance with the the instructions found in Section 3 of this *Procedures for the Oral & Written Qualifying Examinations* document.

## Faculty Instructions for Administering the Written and Oral Qualifying Examinations

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### ***Advancing to candidacy requires passing both the Written and Oral components of the exam.***

Each is evaluated separately. A student can pass the oral exam and fail the written exam, or vice-versa. *The only criteria for determining if the student has passed or failed the oral and written exams are the student's performance during the oral exam and the quality of the written proposals.*

The chair of the Qualifying Examination Committee leads the exam. The exam should occur in the following order:

### **Written Exam**

The committee evaluates the written exams on a Pass/Fail basis. The written proposals must demonstrate a level of writing ability, scientific knowledge, and creative thought commensurate with a student seeking to earn a Ph.D. *Four or five positive votes are required to pass the written exam.* Complete the Report on Written Examination form and provide the student with written feedback on the strengths and weaknesses of the written proposals.

***If the student fails the written exam:*** Provide written comments on the form as to what steps/revisions will be needed for the student pass. The committee may opt to have the student revise one or both proposals. Establish and indicate an appropriate time-line for submitting the revised document(s). The revised documents can be resubmitted as soon as practicable, but *the exam retake must be completed no later than six months after the original exam date.*

### **Oral Exam**

***Both portions of the oral exam must be held. Begin the oral exam with the original research proposal, then proceed onto the dissertation research proposal.*** The committee evaluates the student's oral exam performance on a Pass/Fail basis.

The *original research proposal* will be judged on the student's ability to select and develop an independent research topic, to explain how the research proposal relates to and will advance the current status of the field, and to provide a plausible strategy for carrying out the research. A critical analysis of the state of the art of the chosen field will also be expected.

The *dissertation research proposal* will be evaluated based on the student's demonstrated understanding of the research area, the ability to explain the research objectives clearly in the context of the field, the research progress to date, and the longer-term research plan.

*Four or five positive votes are required to pass the oral exam.* Sign and indicate whether the student passed the oral qualifying exam on Form 3.

***If the student fails the oral exam:*** The committee decides whether or not to allow a retake of the exam. The committee may require the student to repeat one or both proposal topics. If the student fails the written exam, the revised documents can be resubmitted and reevaluated as soon as practicable. If the student fails the oral exam, *the retake cannot occur until at least 3 months have elapsed, and it must be completed no later than 6 months after the original exam date.*