October 2022

CHEMISTRY GENERAL EXAMINATION REQUIREMENTS

The General Exam evaluates your research progress with a written report and an oral exam. You will present your research to a committee of at least four faculty members. Your committee will assess your ability to complete a body of research that is sufficient to earn a Ph.D. This exam is also intended to aid you by enabling other faculty to assess the feasibility of your research, and to offer constructive advice to you and your advisor. The exam should be completed by the end of Spring Quarter of your third year.

Exam Components

- Research Summary Written Report: summary of your research accomplishments and plans
- Oral exam covering research accomplishments and proposed future research
- Review your Individual Development Plan (IDP) with your committee

Possible Outcomes

- Pass: proceed with research
- Retake: repeat exam after additional study. The supervisory committee can recommend a maximum of two additional reexaminations.

Evaluation Criteria

- Demonstrate knowledge/skills appropriate for your subfield of chemistry and your project
- Formulate research questions, explain broader significance, describe alternative plans
- Clear written/oral presentation and ability to answer questions
- This exam is an assessment of whether you have demonstrated concrete research accomplishments and will be able to complete a Ph.D. project. You should be able to describe a well-defined project and explain both what you have done and what needs to be done to complete the next stages of the project. You should also be able to outline plausible backup plans in case the anticipated routes are not successful.
- Consult with your advisor about group-specific expectations before taking the general exam (e.g. publishing a paper or reaching other research milestones).
- See detailed evaluation rubric attached (last page)

Exam Process

- You are strongly encouraged to complete your general exam by the end of **spring quarter of your 3rd year**.
- Students who do not complete the exam by autumn quarter of their fourth year must petition for an extension to remain in Good Academic Standing. Use the following form to send your extension request to the Grad Program Coordinator (your advisor will be cc'd). https://forms.office.com/r/VPjpZSrdUh.
- Your exam committee will include four members, at least three of whom must be UW Graduate Faculty members. Your advisor will be present and serve as the chair of the exam committee.

Oral Exam Format

- At the oral portion you will present your Research Summary. The research presentation is open to a public audience. After the research presentation, the audience will be asked to leave for a closed question session with the committee.
- The total time for the exam, including talks and questions, is **2 hours**. Please plan accordingly. You may not need the entire 2 hours.
- Research Summary: 40 minute presentation, ~40 minutes for questions
- IDP review: 5-10 min at end of the closed session of the exam. See below for guidelines.
- At the end of the exam, you will be asked to leave the room so the committee can discuss whether you have met the evaluation criteria. The committee will complete a "General Exam Progress Report" to record the exam outcome and provide detailed written feedback.

Questions? Contact:

- Jesse Zalatan zalatan@uw.edu, Ph.D. Training Committee Chair
- Christine Gormley chmgprog@uw.edu, Graduate Program Coordinator (GPC)

UW Graduate School Policies

- General Examination
  https://grad.uw.edu/policies-procedures/doctoral-degree-policies/general-examination-admission-to-candidacy-for-doctoral-degree/
- Doctoral Supervisory Committee Roles and Responsibilities
  https://grad.uw.edu/policies-procedures/doctoral-degree-policies/doctoral-supervisory-committee-roles-and-responsibilities/
- Memo 13: Supervisory Committee for Graduate Students
  https://grad.uw.edu/policies-procedures/graduate-school-memoranda/memo-13-supervisory-committee-for-graduate-students/
- Graduate School Representative Eligibility
  https://grad.uw.edu/policies-procedures/doctoral-degree-policies/graduate-school-representative-gsr-eligibility/
- Instructions for Virtual Doctoral Examinations
  https://grad.uw.edu/policies-procedures/doctoral-degree-policies/instructions-for-virtual-doctoral-examinations/

Preparing for the Exam

- Students are strongly encouraged to complete the general exam by the spring quarter of the 3rd year. Discuss with your advisor to determine when you will be ready to take the general exam. You should initiate this discussion during your annual IDP review in the autumn quarter.
- Complete an individual development plan (IDP) and review with your research advisor in autumn quarter of your 3rd year. It is your responsibility to complete your component of the IDP and schedule a meeting with your advisor to review both the advisee and advisor sections. Your IDP is incomplete if you have not reviewed it with your advisor before the exam.
  - You should complete an annual IDP every year until you graduate.
- Assemble your supervisory committee (see below).
- Prepare your written research summary (see detailed guidelines later in this document). Your advisor can give feedback on your written summary but the work you submit to the committee is expected to be your own. You are encouraged to get additional feedback from other graduate students and/or from resources like the UW Writing Center (www.lib.washington.edu/ougl/owrc).
- For the oral presentation, prepare slides (see detailed guidelines later in this document). You should be prepared to elaborate on a chalkboard/whiteboard as needed.

Assembling the Supervisory Committee

- You are responsible for contacting individual faculty members and asking them to serve on your supervisory committee. You can consult your advisor and senior students for advice.
- After you have assembled your committee, submit the "Selection of Supervisory Committee" form to Christine Gormley.
- You can meet individually with your committee members at any time to discuss your research progress. You are not required to meet with committee members prior to the exam.
- Your committee must have at least four members:
  - Your advisor (the chair of the committee). The Chair is responsible for enforcing time limits and recording the results of the exam on the *"General Exam Progress Report"* (with input from the rest of the committee). The Chair must also approve any virtual/hybrid exam formats (see below).
  - Two additional members with expertise in your research area, typically but not always Chemistry faculty.
    - At least one must be UW Graduate Faculty. Usually both are faculty members.
  - The Graduate School Representative (GSR): a faculty member from outside the Chemistry department.
    - The GSR serves as an impartial arbiter and ensures a fair exam. You can pick someone who understands your field and can give constructive feedback.
    - There should be no conflicts of interest (no affiliation with Chemistry, no research collaborations with your advisor).
  - At least two members of your committee must be Chemistry faculty. Your advisor can count towards this total.

    - You can have additional committee members if appropriate, but be aware that exams will become increasingly difficult to schedule.
- Your Supervisory Committee will serve for both your General and Final Exams.
    - Changes to the committee can be made if needed.
    - Your Supervisory Committee does not need to be the same as your 2nd year exam committee but there is often overlap.

Exam Materials

- Your written Research Summary should be delivered to the committee at least **one week before the oral exam**. Include the exam date/time/location on the first page.
- Ask your committee members if they would prefer to receive a hard copy. Electronic copies are usually sufficient.

Scheduling the Exam

- Coordinate with your committee to find a mutually agreeable time, date, and place for the exam. The exam will require a single **two-hour time slot**. Use a web-based scheduling tool to find a time (when2meet/whenisgood are preferred over doodle poll, you should provide a 1-2 week window of available times).
- It is your responsibility to reserve a room or set up a virtual meeting and communicate the time/date/location by email to your committee and the GPC.
- You must schedule the exam in MyGrad no less than three weeks prior to the date of the exam.
    - https://grad.uw.edu/for-students-and-post-docs/mygrad-program/
- It is a good idea to remind your committee members a day or so before the exam.
- At least four committee members must attend the exam, including the Chair and the GSR. If any member is not present, the exam must be rescheduled unless a suitable replacement can be identified.

Virtual Exams

- UW Graduate School policies permit students or committee members to be present virtually if they cannot be present in person. The exam can be entirely virtual or can be hybrid format with some people present physically and others videoconferencing remotely.
- The Chemistry department expects that exams will take place in person, but recognizes that situations like inclement weather, illness, and faculty travel may necessitate virtual or hybrid exams.
- The Committee Chair must approve any virtual/hybrid exam formats.
- If the exam is virtual or hybrid, you must have a means to display handwritten material during the exam. A writing tablet or a camera positioned next to a whiteboard is preferred. If necessary, you can also write on paper and hold it up to a camera. Please ensure that you obtain and test any necessary supplies before the exam starts.

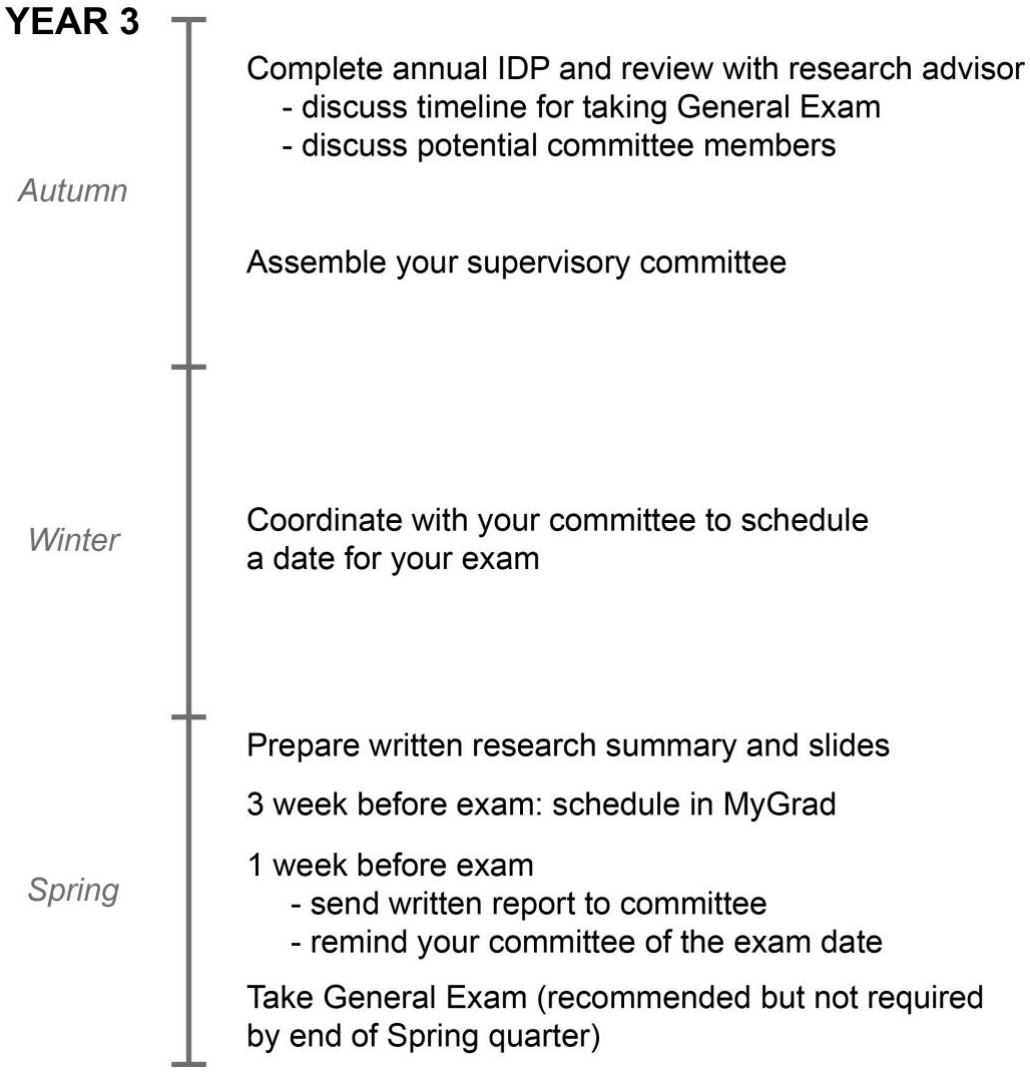
Procedure following a Retake evaluation

- **Retake** indicates that there are major deficiencies that must be reevaluated in an exam format. You will need to retake your exam after additional research and study. Up to two retakes are allowed.
- Consult the “General Exam Progress Report” provided by your committee to identify areas for improvement.

Scheduling Considerations for General and Final Exams

- A General Exam and Final Exam cannot be completed in the same academic quarter.
- A minimum of 27 credits of CHEM 800 is required to graduate, which typically takes three quarters after the General Exam.

    - From the time you pass your General Exam until the time you pass your Final Exam, you will register for CHEM 800, which represents your pre-doctoral research and preparation for your dissertation.
    - CHEM 800 is capped at 10 credits per quarter and you will need at least 3 quarters after taking your General Exam to obtain the required 27 credits to graduate.
    - Note that summer quarter enrollment is typically 2 credits and additional tuition fees may apply if extra credits are taken in the summer.
- With approval from the graduate program advisor, you can enroll in CHEM 800 in the quarter you take your General Exam.
- In unusual circumstances where students may need to graduate shortly after completing their General Exam, you can enroll in CHEM 800 before taking the General Exam.
    - At least one quarter of CHEM 800 must come after passing the General Exam. If you enroll in CHEM 800 in the quarters before, during, and after your General Exam, you can graduate in the quarter after you complete your General Exam.
    - To implement this compressed schedule, you must plan in advance and consult with your committee and the graduate program advisor for approval.



Guidelines for Written Research Summary

The written summary should describe your research accomplishments and plans to complete your Ph.D. research. You have two options for your research summary. Consult your advisor for guidance on which option is the most effective use of your time and will provide the most useful writing training.

Option 1: Write a concise summary of your research (2-3 pages, ~1200-1800 words, 11-12 pt font not counting figures/refs). Include an abstract (150 words), brief background/introduction, results, discussion, conclusions.

- A detailed methods section is not necessary. Note that you will still be expected to answer questions about your methodology in the oral exam.
- If you have contributed to multiple projects, you should focus on a single, self-contained body of research rather than summarizing multiple projects.

Option 2: If you have made a first-author level contribution to a manuscript, drafted or published, you can instead submit:

- Draft Ph.D. thesis abstract (<1 page, typically ~350 words) concisely describing the state of the field, what you have accomplished (or plan to accomplish by the time your Ph.D. is complete), and implications for the field.
- Your drafted or published manuscript.

Writing suggestions:

- Before you begin writing, think about the key 1-2 sentence conclusion that a reader should remember after reading your summary.
- Each paragraph should start with a topic sentence that logically transitions from the previous paragraph and sets up the point of the current paragraph.
- Each paragraph should end with a concluding remark that allows a logical transition to the next point.
- Avoid giving a long list of background details. Make sure the introduction quickly focuses on the question/goal, and then provides the relevant background to establish the importance of this question/goal.
- Do not write a narrative summary of your research in the order you did your experiments. Think carefully about the overall conclusion you want to make and structure your writing to clearly explain and justify this point.

Useful resources:

- Gopen, G. D.; Swan, J. A. The Science of Scientific Writing. *American Scientist* **1990**. https://www.americanscientist.org/blog/the-long-view/the-science-of-scientific-writing
- Whitesides, G. M. Whitesides' group: writing a paper. *Advanced Materials* **2004**, *16* (15), 1375–1377 DOI: 10.1002/adma.200400767.
- So you're writing a paper. *Nat. Methods* **2017**, *14* (12), 1115–1115 DOI: 10.1038/nmeth.4532.
- ACS Guide to Scholarly Communication. https://doi.org/10.1021/acsguide

Guidelines for Oral Research Presentation

Prepare a presentation that describes your research accomplishments and plans to complete your Ph.D. research. You should use slides and be prepared to elaborate on the chalkboard or whiteboard as needed. Aim for a 40 minute presentation. You should expect questions during your presentation, followed by additional questions during the closed session with the committee.

Suggested talk structure:

1. Broad perspective – what are the big questions/goals? Why should the general public care about your research? This perspective should be field-spanning and understandable to non-scientists.
2. What is the focused question/goal for your work? (get here quickly, then go back to additional background if needed)
3. (optional) Show an outline (and come back to outline slide as you proceed)
4. What are the studies you have done or will do to address this question?
5. Describe the individual studies & results
6. Interpret the results, describe conclusions, next question (loop back to #4)
7. Summarize conclusions and immediate future plans
8. Acknowledgments – thank any coauthors, coworkers, collaborators, and funders

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Guidelines for IDP Review During Exam

You must review your IDP with your advisor before your general exam. You do not need to provide your IDP to the committee in advance or during the exam.

At the end of the closed session of the exam, present two summary "IDP Review" slides with the following information:

Slide 1: Progress towards degree

1) Date of IDP review meeting with your advisor
2) Planned timeline to graduation, including what needs to be accomplished

Slide 2: Professional development

1) Current post-graduation plans (does not need to be fully developed)
2) Describe any professional opportunities (such as conferences, technical learning, teaching or mentoring experience, fellowships, outreach activities, or participation in courses, workshops, or training programs either within or outside of UW) that you think will benefit you in the next year (ok to copy directly from your IDP).
3) Are there any areas where your Supervisory Committee can help you achieve your goals (pre- or post-graduation)?

If desired, you can display any additional sections of your IDP to request further feedback from your committee. You are not expected to disclose any personal information that may have arisen in your IDP discussion with your advisor.

At the end of the exam, the committee will complete a "General Exam Progress Report" to record the exam outcome and provide written detailed feedback. The committee will use the evaluation rubric below to determine the exam outcome.

Evaluation Rubric – indicate Y/N in each box below
Y – Meets/Exceeds Expectations; **N** – Does Not Meet Expectations

A student should demonstrate the following	
Progress on thesis research: i. Complete a body of research that is on track towards a publication. a. Formulate testable hypotheses or design metrics b. Plan and conduct independent research c. Obtain concrete/interpretable results d. Analyze results and draw conclusions ii. Describe plans and timeline to complete your Ph.D. thesis iii. Describe backup plans to complete your Ph.D. if your current plan is unsuccessful	
Motivation for research i. Describe the novelty/originality of the research ii. Discuss literature cited in written and oral presentations iii. Explain methods/rationale of scientific approach and how it addresses the broader questions/goals iv. Interpret results v. Identify shortcomings and alternative considerations vi. Plan for immediate follow-up experiments	
Written document i. Explain testable hypotheses or design metrics ii. Summarize outcome(s) of research iii. Use clear logical transitions between ideas iv. Concisely discuss relevant literature precedent(s)/context	

"PASS" requires "Y" in all categories.

Individual Development Plan reviewed and discussed with student: _____

EXAM OUTCOME ____ **PASS** ____ **RETAKE**