QE GUIDELINES FOR STUDENTS

Purpose of the Examination

The aim of the Qualifying Examination is to evaluate the student's preparedness to carry out research and write a doctoral dissertation. The examination provides a means for a faculty committee to assess the ability of the student to use his/her knowledge and understanding of the fundamental facts and principles of molecular and cellular biology to solve current problems in the area of the student's thesis research and in allied fields. The examination lasts approximately 2-3 hours and allows the committee to judge the student's ability to think incisively and critically about both the theoretical and practical aspects of biological research at a number of levels. For eligibility see also "Course Requirements for Graduate Students".

Eligibility

A student must have a 3.0 GPA (B average), have no Incomplete grades, pass their first year ethics courses (Rigor and Reproducibility in Research; Ethics in Science), and be enrolled for the semester in which the exam is taken. Extensions for the qualifying exam will not be given past the fall semester of the student's third year. On a case-by-case basis, students may be allowed to take the qualifying exam before the spring semester of their second year. Approval for taking the exam early is based upon prior coursework and research experience and is at the discretion of the Advisor and the GAC.

Qualifying Examination Timetable

Date	***Participants***	***Required/Need to have***	***Checklist*** ✓
OCTOBER			
Mid - October	2nd Year Students, Head Graduat Adviser, and 2nd Year Advisers, MGN	Attendance at first QE informational meeting	
NOVEMBER			
Early November	2nd Year Student and 2nd Year Advisers	Meet with 2nd year advisers and discuss ideas for inside proposal and choice of topics for the outside papers. Discuss possible outside members.	
Early November	2nd Year Students	QE Worksheet is Due	
DECEMBER			
1st Week	2nd Year Advisers, Head Grad Adviser, and GAO staff member	Committee assignments are made. Advisers must notify any outside members of the request for committee service and confirm their participation. The GAO will notify students of the final committee assignments. Once committee is set, students should start meeting will all QE committee members to understand expectations.	
FEBRUARY			

Last Week	2nd Year Students	Exam date must be scheduled. You must schedule your exam at least six weeks in advance to meet all timelines. Notify the GAO immediately once the date is set but no later than four weeks prior to the exam date. All students should have met with their entire QE committee prior to the exam.	

Countdown checklist

Countdown to Exam Date	***Participants***	***Required/Need to have***	***Checklist*** ✓
At least nine weeks prior to the exam	2nd Year Students	Meet with QE Chair to discuss proposal	
Six weeks prior to the exam	2nd Year Students	Provide QE Chair with outline of proposal	
Four weeks prior to the exam	2nd Year Students	Provide QE Chair 1st draft of proposal	
Three weeks prior to the exam	QE Chair	Feedback to student on proposal draft	
Two weeks prior to the exam	2nd Year Students	Proposal to all QE committee members	
One week prior to the exam	2nd Year Students	Confirm exam date, time, & location with all committee members	

Committee membership

Qualifying Examination Committees will be comprised of four faculty who meet the following criteria:

- Chair - must be a tenured MCB faculty member
  - *Tenured faculty will only serve as the Chair to one QE committee each year, although volunteer requests to chair more than one committee at a time will be honored where appropriate*
- At least one faculty member from the student's division
- At least one faculty member from outside of the student's division
- At least one faculty member for the “inside” papers, and one for the “outside” papers
- An Academic Senate Representative (ASR) (non-adjunct faculty). As of December 18, 2019, your ASR can come from within MCB or outside of MCB.
  - *While your entire committee may be on the Academic Senate, you should have one member specifically assigned to this role as your fourth member.*
  - *This position will be distributed among MCB faculty who do not hold other committee positions whenever possible*

Barring unusual circumstances, the thesis mentor or close personal relations (e.g. spouse) of the thesis mentor should NOT serve on a student’s Qualifying Exam Committee.

Faculty will not serve on more than three QE committees in any given year.

Committee selection

- The 2nd year advisers, in consultation with the Head Graduate Adviser, will make QE committee assignments. Committee composition is based on the dissertation research topic and different

divisional areas (papers) chosen by the student (see Format of the Examination).

- Once the Qualifying Examination Committee has been appointed, the 2nd Year Adviser will contact any outside faculty to ask them to serve and to inform them of the QE format. Once the committee is finalized, the student should introduce himself/herself to the members and briefly discuss the areas to be covered in the examination.

Exam scheduling

The student is expected to schedule and take the examination before the formal end of the Spring Semester. If you are having difficulty scheduling a room you may contact the GAO for additional assistance.

Proposal preparation

- The student should inform the 2nd Year Advisor of the subject of his/her dissertation research area and discuss the choice of topics for the outside reading list.
- Within the timeline above, the student presents detailed outlines for his/her inside research proposal. The inside proposal must be focused on the specific problem being addressed in the student's dissertation research.
- In preparing the inside proposal, the student is encouraged to consult frequently with his/her thesis mentor.
- Proposal Format - 12 pt type, double-spaced, see below for details.
  - Abstract and Aims – limited to one page
  - Background & Significance – limited to three pages
  - Progress Report (if not included in Research Plan) – limited to one page
  - Research Plan – limited to five to six pages
  - Figures – limited to two pages
  - References – no limit

Inside proposal evaluation and revision

After the proposal has been submitted to the chair, it will be evaluated by the chair (or by another member of the committee designated by the chair) according to the timetable above. The purpose of the evaluation is <u>not</u> to identify explicitly or correct specifically any logical flaws or experimental defects, but is to establish whether the proposal provides an adequate basis for examination of the student. However, the Chair is responsible for informing the student if the proposal is unacceptable and for directing revision of the proposal to the extent needed for its approval.

Meeting with committee members before the examination

- Students are required to talk with all members of their qualifying exam committee in advance of the exam to obtain an understanding of faculty expectations, including an appreciation of the scientific background expected.
- Faculty chairs of all committees are required to attend a spring semester meeting led by the Head Graduate Adviser, in advance of all QEs, to discuss expectations and standards for evaluating the QEs.

Balancing time between research and exam preparation

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Students are expected to effectively balance research with exam preparation. Faculty understand that, for several weeks before the exam, students may need to prioritize exam preparation over research. Individual faculty may have different expectations about balancing these two tasks. It is important that you discuss with your thesis advisor your research and exam preparation schedule and their expectations. You should seek their advice well before you begin preparing for the exam.

Format of the exam itself:

- **Part one –** The committee will ask the student to leave the exam room for a brief time so that they can discuss the student's academic record, the quality of the written proposal, and any evaluations of academic and research progress. The student will then return to the room and the committee will begin an oral examination focused on the inside proposal. In general, faculty questions will focus on the areas below, although questions can vary widely, and may take unexpected turns depending on the student's mastery of the material.

  Lines of questioning are designed to assess whether the student:
  - Has mastered the scientific literature that serves as a foundation for the proposed research.
  - Understands the rationale for the proposed experiments and how they will advance the field.
  - Can clearly articulate the methods and logic of the proposed experimental plan.
  - Has foresight into the potential outcomes and implications of the experiments.
  - Understands potential difficulties that may be encountered and has devised strategies to overcome these.
- **Part two -** The committee will ask the student to leave the exam room again for a brief time so that they can discuss the student's performance in part one, plan to revisit issues that arose in part one, and/or finalize the process for part two. Once the student returns, the second part of the exam will begin. This will involve questioning the student on a "body of scientific material", which will comprise 12 journal articles chosen by the faculty to represent seminal papers in the fields represented by each division of the department. The 12 articles will be divided as follows:
  - 9 papers from 3 topic areas (i.e. 3 papers in each area) within the students "inside" division, which will generally be the division that is the mentor's primary affiliation. However, the student may choose any division as his/her inside division.
  - 3 papers from 1 area of a second or "outside" division.

  The 2nd Year Adviser will confirm the identity of the inside and outside divisions.
- Students should demonstrate both a broad and detailed understanding of these papers. They should be able to articulate the history and background discussed in the paper that set the general stage for the contribution, the methods and logic that underlie the conclusions, and the overall importance of the findings within the context of the field and of scientific knowledge in general. Students should be able to synthesize findings from multiple papers and also demonstrate an understanding of how the methods or advances relate to his/her own work. **Please note**: Students are not permitted to bring written notes or to use slides or other presentation materials during the exam; however, students are allowed to bring printouts of the papers selected for the exam. These should be "clean" printouts i.e. no notes, annotations, highlighting, underlining.

After the examination:

At the end of the exam, you will be informed of the outcome – pass, partial fail (failed part(s) but not all of exam) or total fail (failed all parts of the exam). The Chair of your QE committee will write an

evaluation including an analysis of your strengths, weaknesses, and the recommendations of your committee. This feedback/evaluation will be sent to you and your mentor. In the case of a failure or partial failure this write-up is forwarded to the 2nd Yr. Adviser and the Graduate Division.

Exam Failures and Retakes

In case of a failed exam, the student may not retake the exam for at least three months but must retake the exam prior to the end of the following semester.

Food at QEs

Any food at meetings of students with faculty mentors, including qualifying exams and thesis committee meetings, shall be provided by faculty, not students.

Accommodations

Please contact the DSP Office if you qualify for accommodations. dsp@berkeley.edu