

Neuroscience Curriculum Doctoral Preliminary Qualifying Exam

Students are required to take the N BIO Qualifying Exam at the beginning of their second year in graduate school. The exam consists of a written report and a follow-up oral examination that assesses each student's ability to critically evaluate (both positively and negatively) the primary scientific literature, as well as their broad understanding of Neuroscience research. Three faculty members (chosen by the DGS) comprise the committee. Students should **not be assigned** topics central/identical to their thesis lab/project, nor can the thesis advisor serve on their committee. The committee chair chooses - in consultation with the other members if they wish - a research paper that the student is asked to use as a **starting point** for the exam. The exam has two components: 1) a written component containing a brief summary (<1 page single spaced), a critical evaluation of the paper (~2-3 pages), and discussion of future directions/historical context or controversy (~1-2 pages). These page lengths are guidelines; typically exams are ~5 pages. Advanced writing will appreciate the historical context and or controversies of the paper; however, these are not essential for passing. The written document emailed to the committee is followed up by an oral meeting with the three-faculty-committee. **The research paper is not the "be all, end all" of the oral meeting but can be used as a launching point to discuss any related knowledge** that a rising 2nd year N BIO student should know. The qualifying exam must be entirely the work of the student.

The Qualifying Exam is graded on the student's ability to analyze, synthesize, and evaluate the primary literature. Recognition of the broad or historical significance of a paper can be important. There should be minimal written literature review, but critical evaluation of the experiments, and most importantly higher-level critical analyses of the paper. These analyses should evaluate flaws in the paper, alternative interpretations of the outcomes, alternative approaches/methodologies that could have been used, key experiments that may have been lacking, and key experiments to do next. Is the paper a major advance from what's known, or controversial with alternative hypotheses from other groups? Correct grammar/spelling, readability, use of proper scientific terms, and clear formatting/presentation (**headings, subheadings**) are factors in grading. The document should not exceed 5-6 pages of single spaced, 11-point font and 1-inch margins. The page limit does not include completely optional illustrations and mandatory **References**.

The student may use the white board to communicate key ideas/pathways/techniques/circuits or overview before **or during** the exam either in preparation or response, but no electronics nor handouts may be given to the committee. ("Chalk Talk" style) (Students typically will arrive 10-15 minutes early to prepare the white board with 2-4 key schematics/pathways/techniques they may want to refer to. These should not be figures from the paper *per se* which the committee and student will have before them.)

The student may have a physical copy of the assigned publication with handwritten notes on it during the exam and may refer to it (or figures) whenever desired. Answers to questions should reveal a sophisticated understanding of the paper with an ability to extend beyond the data in the paper. The committee may help prompt the student to answer a question if difficulty arises. The final single grade combines both the written exam and oral follow-up. The oral component can be useful to "test" any areas that may have been unclear/underwhelming in the written document to the benefit of the student.

The Mechanics of the Exam:

The committee chair (with the assistance of the student services admin) schedules the written and oral exam date/time and selects the primary research publication that will serve as the exam basis. The exam publication is emailed (or made available in Sakai) to the student exactly two weeks prior to the oral exam date (with copies to the committee). Depending on availability, a faculty observer/participant (typically DGS) serves on multiple committees to ensure similar standards across committees.

The student must immediately acknowledge by emailing the committee, DGS and student services manager if they have difficulty obtaining the exam on the release date. The written exam is due **by 5 pm one week** after the student receives the paper assigned. **The student must email the entire committee and student services manager** the final PDF of the written exam. The oral exam will be conducted one week following the submission of the written exam to the exam committee. (start to finish = 2 weeks)

On exam day, the student may arrive early and prepare the white board with any key figures/diagrams/schematics that the student feels are helpful to refer to during the oral exam. The student will be asked to leave the room briefly while the committee discusses the student's class performance and the written exam itself, and any area for targeted exploration that may have been lacking in the written document. The student returns and the oral exam begins; typically, the committee will give the student a few minutes to state conclusions, or highs and lows of the assigned paper before the questioning begins. Following the oral exam (**1.5 hours maximum**), the student briefly leaves the room for the committee members to discuss and decide on the student's performance and outcome. The student is then invited back in the room and told the outcome. Using the comments from the group discussion, the **committee chair writes a performance summary** (about a paragraph within a few days of the exam) on both the written and oral components and emails it to the committee, student, student mentor, and student services manager.

The possible outcomes of the exam are as follows:

A) **Fail**. This requires the student to repeat the exam with a new paper and mostly new committee (typically in the following semester).

B) **Pass**. This grade successfully fulfills the Graduate School requirements for the Doctoral Preliminary Qualifying Exam.

C) **Conditional Pass**. VERY RARE outcome. A student's overall exam may be good, but revealed severe deficiencies, the committee may ask the student to correct a key deficiency **if** they can be corrected. This may involve rewriting aspects of the proposal or taking additional coursework that targets and will fix the deficiency. (In most years we should not have any; do not use this option as a crutch instead of "Fail" or "Pass" or to signify the exam could have been better. The committee, **particularly if a subject course or rewrite will not fix the underlying issue**, should instead choose "pass" or "fail". If you are thinking of this category, think/discuss again and try to pick pass or fail instead. There are cases where a rewrite or taking a targeted topic area class will substantially help the student's development, but this is a statistically rare event.