Comprehensive Examination for PhD Students (Neuroscience 9600)

Purpose
The comprehensive examination must be undertaken within the first 18 months of registration in the PhD program. The purpose of the Comprehensive Exam is to evaluate the student’s knowledge of his field of research and related fields, the ability to critically reflect on different experimental approaches, to link different concepts and to conduct research at the level of a PhD student. There are two alternative forms of comprehensive examination that each student can choose from in consultation with the supervisor and advisory committee. Option 1: a Classic Comprehensive Examination or option 2: a Grant Writing Exercise.

Option 1: Classic Comprehensive Examination

Establishing an Examination committee

The student is expected to be able to recall facts, recognize general concepts, use new information to solve novel problems, be aware of the historical development of the sub-discipline, and be familiar with the current research methods in his/her own related fields. The scope and subject area of the comprehensive examination are suggested by the student and supervisor. The examination is administered by an examination committee chaired by a program representative and three examiners. Members of the Advisory Committee, excluding the supervisor, and faculty that are not member of the neuroscience program may serve on the examination committee. The examination consists of a written component and an oral component. The candidate is normally informed of the composition of the examining committee four weeks prior to the written examination.

In general, three different areas of Neuroscience are covered with a proposed examiner for each topic. The topics should be specified in sufficient detail appropriate for the PhD level. These topics are submitted to the program committee for discussion and approval. Students should arrange to meet several times with each examiner to discuss readings and areas which should be concentrated on for the examination.

The Written Examination

The written examination consists of at least three principal questions prepared by the examination committee. The student will generally be given a choice within the principal questions. The examination will last four hours. Each question is graded by at least two faculty members. To pass the written component of the examination, an overall grade of "B" (70%) is required on each of the questions.
The Oral Examination

The oral component of the examination is taken after the candidate has passed the written component, approximately one week later. The duration of the oral examination is usually about two hours. Only members of the examination committee can ask questions; other faculty/students can attend but do not participate. At the conclusion of the oral examination, the examinee and guests leave the room and then the chair invites discussion of the candidate's performance prior to calling for a vote. Pass or fail votes are collected by written ballot from members of the examination committee, with the majority opinion determining the result. The chair votes only in the event of a tie. At the conclusion of the examination, the chair verbally informs the student of the outcome and transmits any comments the examiners might suggest. The student is also provided with a letter from the chair of the examining committee stating the results of the examination and, where appropriate, comments on his/her performance.

Option 2: Grant Writing Exercise

Format and Writing Process

To test the student’s abilities to critically reflect on different experimental approaches, to link different concepts and to conduct research at the level of a PhD student, the student will write a grant proposal. The proposal must outline a research project of 3-5 years (usually 3 aims). It must contain a lay abstract (<250 words), a summary (<500 words), plus the main body of 9 pages or less (12 point, 1 inch margins). Additional pages are permitted for references, tables and figures. The grant proposal should be related to - but not be the same as - the research of the respective student and must be an original idea. The topic is subject to approval by the Program Committee.

The grant is to be written by the student as an independent exercise. However, the student will consult with mentor(s) during the initial stages. The mentor(s) will provide feedback as to the scope of the research and the specific aims during the preparation of the initial summary page only. The mentor will not edit (or write) the summary page, but rather provide feedback concerning the hypotheses and proposed experiments, and may point the student in the right direction to think about expected outcomes and potential caveats of the experiments. Typically, the student will have several meetings and/or email exchanges with the mentor(s) over the course of several weeks. Once the summary page is submitted, the mentor will no longer be permitted to provide feedback on the scope of the research, but may be consulted on matters of methodology or grant format.

Evaluation and Examination Process

1. **Mentors**: One or more mentors may be selected by the student in consultation with the supervisor and may include the supervisor but not the examiners.

2. **Examiners**: The examining committee will be chaired by a Program Committee member and will consist of three examiners. Members of the Advisory Committee, excluding the supervisor, and faculty that are not member of the neuroscience program may serve on the
examination committee. The student will select potential examiner and list them in order of preference. The Program Committee chair will be assigned. The Program Committee will approach examiners in the order listed by the student. However, there may be instances where the student will need to provide additional names. The student may solicit the advice of the mentor(s) and/or supervisor when considering examiners. The final examining committee is subject to approval by the Program Committee.

3. **Written Component:** After the submission of the summary page, the student will have 4 weeks to write and submit the full written grant proposal. The student must submit an electronic copy of the full grant proposal and one paper copy (for the program files) to the Graduate Assistant and the Director of the Neuroscience Program. Examiners may request additional paper copies as needed.

The grant will be evaluated by the examiners within 1.5 weeks of submission. For the evaluation of the written component, emphasis will be placed on the ideas, hypotheses, experimental designs and discussion of outcomes and caveats.

The proposal will be rated as either “Acceptable”, “Acceptable with Minor Revisions”, or “In Need of Major Revision”. At least two out of the three examiners must find the grant proposal “Acceptable” and/or “Acceptable with Minor Revisions” to proceed to the oral exam. If the grant is deemed “In Need of Major Revision”, students will receive written feedback and will have 3 weeks to correct the deficiencies in the proposal and resubmit.

4. **Oral Exam:** Once the written proposal has been accepted, an oral exam focused on the grant proposal will take place, usually 2 weeks after the date of initial grant submission. The oral exam will follow the traditional MSc exam format; a short 15 minute presentation followed by 2 rounds of questioning (15 minutes & 10 minutes).

The primary goal of the oral exam is test the student’s critical thinking skills. Questions can be related to any of the topics included in the grant and will be designed to test the students ability to “think like a scientist”. In addition, students may also be tested on general background knowledge related to the discipline of the grant and technical considerations within the proposal. The supervisor is encouraged to be present during the examination but may not speak or participate in the examination or evaluation process.

After the oral examination, the examiners will deliberate in the absence of the student and the supervisor and provide a grade of Pass or Fail by majority consensus. Oral and written feedback will also be provided to the student and shared with the supervisor.

5. **Plagiarism:** All grants will be screened using online software such as www.turnitin.com to detect plagiarism. The online software is accessible to both faculty and students for analysis. Students that are unclear about the precise definition of plagiarism should discuss the matter with the Director of the Neuroscience Program or a member of the Program Committee. Some information is available from the Faculty of Graduate Studies at http://grad.uwo.ca/section_ten.htm. Plagiarism is an extremely serious academic offence that could result in dismissal from the program.
**Timeline**

Students are expected to devote the majority of their time to preparing for and completing the comprehensive exam in the four weeks prior to the written examination or submission of the grant proposal. Supervisors are asked to respect this and should not expect the student to spend much time on experiments during this time period. Students with research activities (i.e. presentation at a scientific meeting) that conflict with the Comprehensive timeline should consult the Director of the Neuroscience Program to arrange an alternate timeline.

**Result of the Comprehensive Exam**

A student is permitted two attempts at the written examination, or one major revision of the grant proposal. After successful completion of the written component, the student has only one attempt at the oral component. If unsuccessful at any of the components, the student will meet with the Advisory Committee to determine a course of action, which normally would involve withdrawal from the graduate program.