

NEURO 450 COURSE GUIDELINES & REQUIREMENTS

A guide for students and supervisors

(Fall or Winter) An individual study course involving detailed reading on a selected topic in cellular, molecular, systems, or cognitive neuroscience. Students will select a member of the Neuroscience and Mental Health Institute who will guide them through a course of reading on a specialized topic at an advanced level. Completion of this course requires an oral presentation to an examining committee. Restricted to students in the Honors program in Neuroscience. Prerequisites: PMCOL 371, PHYSL 372.

Supervisors of students taking NEURO 450 are asked to consider the following guidelines for evaluating student performance. Your cooperation will help to establish reasonably uniform standards of evaluation among different supervisors. It is also important that students clearly understand what is expected of them in this course, and again, your cooperation in communicating these expectations to them will help to eliminate any discrepancy between the student's perceived expectations and your own.

Objectives

Generally, the primary objective of NEURO 450 is to train students to critically read and evaluate original research literature focussed on a topic of current relevance in the neurosciences.

Course highlights:

1. **2 essays** are to be assigned and marked by the supervisor and the second examiner. Each must be **10 pages maximum**, not including figures, tables, and bibliography, and each should be written in a format similar to a short review article in a scientific journal.
2. The 2 essays should deal with related sub-topics that all have a single unifying theme centered on a major topic in the neurosciences. For example, the 2 essays may deal with, respectively, the roles of sodium, calcium, and potassium channels in electrical signalling in dendrites. The unifying theme in this example would be the electrophysiology of dendrites.
3. The first essay is due at the middle of the term and the second before the end of the term. Essay deadline dates must be set by the supervisor at the start of the term and clearly communicated to the student.
4. **Both essays must be graded by the supervisor and second examiner before the final oral exam at the end of term.**

Each essay must clearly explain or describe the following aspects of a specific topic:

1. The importance of the topic to the overall development and advancement of the field of research. Provide a brief overview of the topic, as an introduction to the main body of the paper.
2. In a discussion section, describe the data that were outstanding in shaping the thinking of investigators in the field. Which papers or data were the most significant, and why were they significant? Are there any controversies in the field, and if so, what are they and how did they arise? Who are the leading researchers in the field, and what did they contribute to the field? *This section should be the “meat” of the essay. Be selective in the choice of issues to be discussed.*
3. What key principles or concepts can be derived from the papers covered in the essay?
4. A concluding section must be included, in which the student briefly summarizes the essay’s main points and states clearly his/her own opinions on the current state of the topic, and on logical future directions in the field of research under examination. Are there significant gaps in knowledge? If so, what kind of experiments or research strategies might be pursued to fill these gaps?

Key points on writing the essays:

1. The essays should be clearly written with a logical organization and “flow” of ideas and hypotheses. Figures and diagrams are to be used where appropriate.
2. The essays should explicitly state, early on, the major issues or controversies to be discussed, and the perceived importance of these issues to the field of research. Essays should show a clear awareness of current major issues or controversies in a particular field.
3. The essays should show a clear appreciation of the relevance of selected data to the conceptual development and/or current state of knowledge in a field.

The essays must show some attempt by the student to critically evaluate the value and impact of selected papers to the field of research being considered. In other words, why is the paper by J. Doe et al. more significant than that by M. Whitewash et al.? It is important that the views expressed here be the student’s own opinions, and not those of published articles that are merely paraphrased by the student. If the student chooses to paraphrase published opinions, then it is vital that the student cites the literature source and provides logical reasons for his/her agreement/disagreement with the paraphrased viewpoints.

Evaluation of Essays:

There is much leeway for objectively determining what constitutes “fair” or “excellent” performance in a course. However, some fundamental criteria can be suggested:

Essays that are superbly written (with no errors in logic and fact), that satisfy all of the above criteria, **AND** that show some **novel and potentially significant insight(s)** should be graded as “**outstanding**” (94-100%). These essays are those that might closely resemble short reviews published in journals such as *Trends in Neuroscience* or *Current Opinion in Neurobiology*.

Essays that are well-written, with few errors in logic and fact, and that satisfy all of the above four criteria while showing no novel and potentially significant insight(s), should be graded as “**excellent**” (85-93%).

Essays that solidly satisfy only criteria 1, 2, and 3 above, without showing evidence of logical critical assessment of the literature (criterion 4), should be graded as “**very good**” (81-84%).

The full grade scale should be used to assign marks below 81% as appropriate.

Any essay that, in the opinion of the supervisor, shows evidence of plagiarism on the part of the student, should receive a failing mark, and the course coordinator should be notified.

Oral Presentation Guidelines:

In addition to the written reports, the student must give an oral presentation to an examining committee at the end of the course. The committee will include the student’s supervisor, a second faculty member, and the course coordinator. **The presentation must be no more than 20 minutes, and it will be followed by questioning from the committee members. The selection of a second faculty member is the responsibility of the supervisor.**

Students will be expected to know the general background literature relevant to their particular research topics, and they must be able to discuss the significance of their readings. Students are encouraged to use diagrams and figures to clarify complex hypotheses and data. An awareness of the issues and controversies in the field of research being reviewed is required. It is expected that students will be able to answer broader questions about basic neuroscience/physiology as it pertains to their project.

After the presentation and at a separate time that is convenient for the student, the supervisor must meet formally with the student to provide detailed feedback concerning the student’s performance at the oral exam. In particular, the supervisor should point out the strengths and weaknesses of the student’s oral presentation.

The final grade for the course will be determined from the aggregate marks obtained from the written essays, oral presentation, and laboratory performance, each weighed as follows:

1. 2 essays: Supervisor's and second examiners's marks 50%
2. Oral presentation 25%
3. Mark for one-on-one discussions (Supervisor-assigned): 25%

The mark for one-on-one discussions will be based on the quality of a student's intellectual interactions with the supervisor during the course. Factors to consider include: the depth and breadth of the student's discussions and readings, the student's eagerness to explore specific issues at an in-depth level, and the amount of initiative taken by the student.

Full grade scale:

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|--------------|---------|-----|----|
| Outstanding | 94-100% | 4.0 | A+ |
| Excellent | 85-93% | 4.0 | A |
| Very good | 81-84% | 3.7 | A- |
| | 77-80% | 3.3 | B+ |
| Good | 73-76% | 3.0 | B |
| | 70-72% | 2.7 | B- |
| | 64-69% | 2.3 | C+ |
| Satisfactory | 61-63% | 2.0 | C |
| | 57-60% | 1.7 | C- |
| Minimal Pass | 54-57% | 1.0 | D |
| Fail | 1-53% | 0.0 | F |