

NEURO 451/452: RESEARCH TOPICS IN NEUROSCIENCE

GUIDELINES FOR STUDENTS AND SUPERVISORS

Students taking NEURO 451/452 and their supervisors are asked to please review the following guidelines to understand what is expected of the students in this course. This document also provides general guidelines for preparing for the exams (for students) and for evaluating students' exams (for supervisors). Your cooperation will help to establish reasonably uniform standards of evaluation among different supervisors.

Objectives

The primary objective of NEURO 451/452 is to train students in laboratory research and experimental neuroscience.

Registration

Registration deadlines follow the University calendar. If you are considering taking Neuro 451/452 in your 3rd year, please be aware that your registration might be processed with a slight delay to ensure that all 4th year students interested in this course have found a placement first.

Make sure you find a supervisor and discuss with them the research project you will develop and related requirements well in advance of registration deadline. Finding a supervisor might take time. Start searching early.

Ethics and biosafety requirements

Due to the COVID-19 emergency and new regulations, **ALL STUDENTS MUST COMPLETE** the "RETURN TO CAMPUS" learning module (available at <https://training.ehs.ualberta.ca/login/index.php>) and **WILL HAVE TO BE ADDED to the supervisor's EHS ARISE lab database** at the time of registration (please consult with your supervisor on how to do this).

Human/Animal ethics approval, as required for the project, **MUST BE IN PLACE** at the time of registration. Supervisors and students must take this into account when designing a project for these courses.

Laboratory and project-specific **biosafety training** must be provided to the student by the supervisor or any other qualified member of the supervisor's laboratory at the beginning of the course and prior to starting wet laboratory work, if applicable.

Computer and wi-fi requirements (required during the COVID-19 emergency)

As the final examination will be conducted through Zoom videoconference, students must have access to a computer and a reliable wi-fi network at the time of examination, in order to make their presentation via Zoom.

Expectations

- (A) Students enrolled in NEURO 451/452 are expected to be actively involved in a research project in neuroscience for the duration of the course.
- (B) Students will write and submit a lab report to the supervisor and a second expert examiner at least one week before the final oral exam.
- (C) Students will prepare an oral presentation on their work for the final exam

(A) Laboratory work

Students enrolled in NEURO451/452 are expected to spend a minimum of 8 hours/week in the lab of their supervisor. It is important to understand that most projects may require a higher number of dedicated hours per week, as well as a considerable degree of flexibility from the student, to adapt to laboratory dynamics and

experimental requirements. Students are strongly encouraged to discuss their project and the specific minimum commitment required with their potential supervisor.

Students are also required to understand and learn the details of the experimental procedures and techniques they use in their project. They should also become familiar with the basic literature and background for their project.

(B) Guidelines for lab reports

The laboratory report should be written in a format similar to a research article in a scientific journal. It must be **15 pages maximum**, double line spacing, not including figures, tables, and bibliography.

The report must contain the following material:

- 1) An **“Introduction”**. Provide a brief overview of the research field that is directly relevant to the project. State the hypotheses tested and discuss the rationale for the approach.
- 2) In a **“Methods” section**, describe the methods used in the project in details.
- 3) In a **“Results” section**, describe data obtained and statistical evaluations. Figures and tables should be clearly labeled and placed in order at the end of the paper, after the bibliography. Each figure or table should have a legend.
- 4) A **“Discussion” section** must be included, in which the student briefly summarizes the main findings, discusses whether the original hypothesis is supported or confuted, and clearly states his/her own conclusions. The student should try to explain how the reported data fit into the current pool of knowledge. The student should also demonstrate an understanding of the strengths and limitations of the techniques and experimental approaches that were used in his/her study.
- 5) A **list of papers cited** in the report is also required; this must conform to accepted styles of scientific literature citations. For example: Woo, N.H., Duffy, S.N., Abel, T., and Nguyen, P.V. (2000). Genetic and pharmacological demonstration of differential recruitment of cAMP-dependent protein kinases by synaptic activity. *The Journal of Neurophysiology*, 84: 2739-2745.

The report **must be submitted** to the supervisor and the second expert examiner **at least one week before the oral examination**.

Supervisors and second examiner should read and mark the report before the oral examination takes place.

Supervisors are encouraged to provide students with suggestions on the structure and the content of the report, but are not required to revise drafts of the document and **SHOULD NOT** revise the final version of the document.

(C) Guidelines for the oral presentation

The presentation must be no more than 20 minutes. The selection of a second faculty member is the responsibility of the supervisor.

The presentation should include background information on the research topic. Hypothesis and research questions should be clearly stated. Depending on the nature of the project, a description of the methods used should also be included. Results should be presented with the use of images, graphs and/or tables as appropriate. At the end of the presentation, data should be summarized and conclusions should be clearly stated.

Depending on the nature of the project, a model where hypothesis, findings and conclusions are presented in the context of current knowledge should also be presented.

Final exam

Final examinations will be conducted by Zoom videoconferencing. Zoom link for the examination will be provided by the course coordinator ahead of the scheduled exam date.

Students will give an oral presentation (see above) and will be examined by a committee composed by the supervisor, the second examiner and the course coordinator. **The selection of a second faculty member with expertise in the specific area of research is the responsibility of the supervisor.**

Students will be expected to know the general background literature relevant to their particular research topic, and details of the experimental procedures used. They should be able to discuss the significance, strengths and limitations of their findings and put them in context with current knowledge in the field.

After the presentation and at a separate time that is convenient for both, the supervisor and the student are encouraged to meet again, if necessary, so that additional feedback concerning the student's performance at the oral exam and on the written paper can be provided in more details. In particular, the supervisor should point out

the strengths and weaknesses of the student's oral presentation and written report, as discussed by the examining committee.

Guidelines for the evaluation of the laboratory report

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

- 1) The report should be clearly written with a logical organization and "flow" of ideas and hypotheses.
- 2) Hypothesis and rationale for the experiments performed should be clearly stated.
- 3) Literature that is relevant to the research project should be discussed, to help framing the scientific questions asked, the hypothesis and the conclusions of the student's work.
- 4) Material and methods used should be clearly and sufficiently reported.
- 5) Results should be clearly laid out, in an organized and logical manner. Figures and tables should be clearly labeled and of a quality that would be suitable for a thesis or research paper.
- 6) The discussion should clearly reveal the ability of the student to critically interpret the significance of the project and/or data produced, limitations and strengths.

Essays that are superbly written (with no errors in logic, style and facts), that satisfy all of the above criteria, **AND** that show **excellent critical thinking and significant insight(s)** should be graded as "**outstanding**" (94-100%).

Essays that are well-written, and that satisfy all of the above criteria while showing no novel and potentially significant insight(s), should be graded as "**excellent**" (85-93%).

Essays that solidly satisfy most of the criteria above, without showing evidence of logical critical assessment of the literature or insights into the significance of the project and data 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.

Grading

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

Lab report: average of supervisor's mark & second examiner's mark 1/3
Powerpoint presentation: average of supervisor, second examiner and course co-ordinator's marks.....
1/3
Lab performance mark (supervisor-assigned).....1/3

The lab performance mark should consider the student's diligence, hours spent on laboratory work, technical competence at the bench, originality where applicable, problem-solving ability, perseverance, motivation, and general aptitude for laboratory research.

Final grades in this course are on a 4-point scale, defined as follows:

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

Additional important notes for students

1- Student Responsibilities:

ACADEMIC INTEGRITY: "The University of Alberta is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the Code of Student Behaviour (online at www.governance.ualberta.ca) and avoid any behaviour which could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence. Academic dishonesty is a serious offence and can result in suspension or expulsion from the University."

All forms of dishonesty are unacceptable at the University. Any offence will be reported to the Associate Dean of Science who will determine the disciplinary action to be taken. Cheating, plagiarism and misrepresentation of facts are serious offences. Anyone who engages in these practices will receive at minimum a grade of zero for the exam or paper in question and no opportunity will be given to replace the grade or redistribute the weights. As well, in the Faculty of Science the sanction for **cheating** on any examination will include **a disciplinary failing grade** (NO EXCEPTIONS) and senior students should expect a period of suspension or expulsion from the University of Alberta

2- COLLABORATIONS

The University of Alberta recognizes collaboration as an important part of intellectual and academic development. Collaboration can produce creative and innovative ideas and research; however, if students engage in inappropriate collaboration, it gives them unfair academic advantage and is a violation of the Code of Student Behaviour. Much like citing your sources in a paper, it's all about being transparent. When assigning you a grade, your professors need to know how much of the work was your own and to what extent you received help. It is acceptable that you include in your written documents and/or oral presentations data (in the form of figures, tables, etc), schemes, diagrams, etc. from other people from your research group if the contributions of other are highlighted appropriately. For more information follow the *Appropriate Collaboration link on the Office of Student Judicial Affairs website* (<http://www.osja.ualberta.ca/Students/AppropriateCollaboration.aspx>)

3- STUDENTS ELIGIBLE FOR ACCESSIBILITY-RELATED ACCOMMODATIONS (students registered with Specialized Support & Disability Services - SSDS): Eligible students have both rights and responsibilities with regard to accessibility-related accommodations. Consequently, scheduling exam accommodations in accordance with SSDS deadlines and procedures is essential. Please note adherence to procedures and deadlines is required for U of A to provide accommodations. Contact SSDS (www.ssd.ualberta.ca) for further information.