1 Course Details

1.1 Calendar Description

This is the second part of the two-semester undergraduate research course (NEUR*4421/2). Students will continue to work under the supervision of the faculty member from NEUR*4421 and will enroll in NEUR*4422 in the semester immediately following the completion of NEUR*4421. A grade will not be assigned in NEUR*4421 until NEUR*4422 has been completed.

Pre-Requisites: NEUR*4421
Restrictions: BIOM*4510, BIOM*4521, BIOM*4522, NEUR*4401, NEUR*4402, NEUR*4450. Instructor consent required. Restricted to students in BSCH.NEUR, BSCH.NEUR:C and NEUR minor.

1.2 Course Description

Objectives: This research course is designed to expose students to neuroscience research where information is created, interpreted, and integrated with current knowledge, and to teach effective skills for communicating scientific information orally and in writing. It is important to realize that this course is at the undergraduate level. The research project should be well-defined and have a reasonable likelihood of success. This course is not miniMasters and certainly should not involve a rigorous series of experiments.

1.3 Timetable

There will be an optional introductory class held near the beginning of the semester, where the course coordinator will be available to answer questions about the course. Student oral presentations will take place the second last week of classes.

1.4 Final Exam

There will be no final examination for this course.
2 Instructional Support

2.1 Instructional Support Team

<table>
<thead>
<tr>
<th>Role</th>
<th>Name</th>
<th>Contact Information</th>
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</thead>
<tbody>
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</tr>
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3 Learning Resources

4 Learning Outcomes

4.1 Course Learning Outcomes

By the end of this course, you should be able to:

1. Critically evaluate multiple perspectives, ideas, and arguments related to neuroscience by gathering and integrating relevant information from the literature, assessing its credibility, and synthesizing evidence to draw conclusions.
2. Identify a problem and propose a neuroscience related research question using creativity, interdisciplinary experiences, and a depth and breadth of knowledge/expertise in neuroscience.
3. Accurately and effectively communicate ideas, arguments and analyses, to a range of audiences, in graphic, oral and written form.
4. Apply scientific methods to construct an appropriate study design to investigate a research question in neuroscience.
5. Generate and interpret unbiased and sufficient data using quantitative, qualitative and analytical methodologies and techniques to draw conclusions and make scientifically based observations.
6. Identify and apply relevant contemporary research methods, skills and techniques to
conduct independent inquiry in neuroscience.
7. Reflect on the personal and professional development through the completion of a research project.

5 Teaching and Learning Activities

5.1
1. Near the beginning of the semester:
   - There will be an optional introductory class held by the course coordinator
2. Near the end of the semester:
   - Oral presentations are held during the second last week of classes.
   - The written report and reflective activity normally are due on the final day of classes.

5.2
1. When the seminar begins, students should contact their supervisor and begin working on their laboratory project according to his/her directions.
2. Maintain regular contact with your supervisor throughout the semester, to discuss your progress. Many supervisors arrange a regularly weekly meeting with students.
3. You need to discuss with your supervisor the points raised in the Seminar Questionnaire. This form needs to be returned to Kim Best (rm 2633, OVC; kbestb@uoguelph.ca) before the deadline date to facilitate planning the seminar days. If this questionnaire is not received by the date in the deadline dates, 5 marks will be deducted from your final grade.
4. You will prepare your seminar slides/presentation using PowerPoint and upload this file to Sharepoint (information and link will be provided). The due date for uploading is 8a the day of your presentation. If you are late uploading your presentation, 5% will be deducted from your final grade.
5. Preview and practice your presentation with your supervisor/lab group.
6. You are expected to participate in and critique your colleagues’ presentations. A Sharepoint link will be provided with an on-line evaluation form. Please make sure, when completed, your evaluation form has been successfully uploaded.
7. We ask that you complete an on-line course evaluation during the last 2 weeks of classes.
8. A preliminary draft of your written report should be submitted to your supervisor for general comments and feedback before the final copy is submitted. Allow time for this to occur in consultation with your supervisor. The date provided in the Semester Deadlines is to be used as a guideline. Consult with your supervisor when report is due.

6 Assessments

6.1 Marking Schemes & Distributions
Students will not be penalized if a project fails due to circumstances beyond their control. In such cases, however, students should give a critical appraisal of the problem(s) encountered, and the emphasis of the project may be re-directed to improving the methodology.

Please Note: the percentage allocations below contribute to the overall grade for NEUR*4421 AND NEUR*4422 together, which will be calculated and provided on your transcript once NEUR*4402 is completed. An ‘in progress’ INP will appear on your transcript for both NEUR*4421 until NEUR*4422 is completed, at which time the overall grade will appear for both courses.

6.1

**Final Seminar Presentation (25%)**
Students will deliver a final seminar presentation for the second semester on their overall project. This consists of an oral presentation in the form of a 10-minute PowerPoint presentation followed by a 5-minute question period (on one of the regularly scheduled seminar days for that semester). Please note that PowerPoint “presenter view” will not be available for the oral presentation. The structure of this presentation may be designed in consultation with your supervisor. A typical presentation may include the following components: 1. An Introduction - general terms to orient the audience and provide background information. 2. Hypothesis/Objectives - definition of the scope of the experimental project. 3. Methodology/Experimental Design - this will provide an overview of the methods used. 4. Experimental Results. 5. Discussion of Results. 6. Summary/Conclusions - review of the main points and concise conclusions.

**Final Written Report (25% - 1 reviewer)**
Your supervisor will mark this report. The due date given for the final written report is given as a guideline (see Semester Deadlines). The report can be submitted to the supervisor electronically or in paper format, depending on the supervisor’s preference. An alternate due-date can be agreed upon by the student and supervisor. Marks must be submitted to the course coordinator no later than the date indicated on the Semester Deadlines page.

Reports should be written in the format of a Neuroscience journal of the supervisor’s choosing, with the following sections: Title Page, Abstract, Key Words, Introduction, Materials and Methods, Results, Discussion, Conclusions, and References. The emphasis will be on the presentation and discussion of the research data generated during the semester. The references for this report should be in the format of the chosen journal. It is appropriate for the supervisor to read a draft of the project final report and offer specific suggestions for improvement before the student submits the final version. Faculty supervisors provide advice
and feedback to their graduate students when the latter are drafting their MSc or PhD thesis. This feedback is part of the learning process and should be part of the research project course experience as well. Students should schedule this preliminary reading with their supervisors well in advance of the due date of the report.

**Evaluation of your Colleagues’ Seminars (5 in total) (2.5%)**
Students are required to assist with the evaluation of their colleagues’ presentations and to participate in the question periods. Each student must submit a minimum of 5 peer evaluations each semester (5 x 0.5% each = 2.5%). These evaluations must have your name clearly printed on the bottom of the page to receive the full marks. The presenter’s seminar mark will be calculated as the average of all faculty scores submitted, however, presenters and supervisors will receive a copy of all faculty + peer evaluations, in order to evaluate all feedback provided for the presentation. Students are encouraged to review this feedback with their supervisor.

**Reflective Activity (2.5%; 1 pg max)**
Students will prepare a written reflection on their personal and professional development throughout this research project.

**Assessment by the Supervisor (20%)**
The supervisor will provide an overall assessment of the student’s work over the two semesters for NEUR*4421/2. This supervisor assessment might include factors such as: overall effort made on the project, interaction with others in the laboratory, organization of time, preparation for meetings, development of technical competence and quality of laboratory notes, etc. The student should discuss the specific criteria for this assessment with the supervisor before the project begins.

**NEUR*4421 assessments (25%)**
The graded components from the first semester (NEUR*4421) will contribute 25% toward the total final grade for both courses/semesters.

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**7 University Statements**

**7.1 Email Communication**
As per university regulations, all students are required to check their e-mail account regularly: e-mail is the official route of communication between the University and its students.
7.2 When You Cannot Meet a Course Requirement

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. The grounds for Academic Consideration are detailed in the Undergraduate and Graduate Calendars.

Undergraduate Calendar - Academic Consideration and Appeals
https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml

Graduate Calendar - Grounds for Academic Consideration
https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml

Associate Diploma Calendar - Academic Consideration, Appeals and Petitions
https://www.uoguelph.ca/registrar/calendars/diploma/current/index.shtml

7.3 Drop Date

Students will have until the last day of classes to drop courses without academic penalty. The deadline to drop two-semester courses will be the last day of classes in the second semester. This applies to all students (undergraduate, graduate and diploma) except for Doctor of Veterinary Medicine and Associate Diploma in Veterinary Technology (conventional and alternative delivery) students. The regulations and procedures for course registration are available in their respective Academic Calendars.

Undergraduate Calendar - Dropping Courses
https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml

Graduate Calendar - Registration Changes
https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/genreg-regregchg.shtml

Associate Diploma Calendar - Dropping Courses
https://www.uoguelph.ca/registrar/calendars/diploma/current/c08/c08-drop.shtml

7.4 Copies of Out-of-class Assignments

Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

7.5 Accessibility

The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is
required; however, interim accommodations may be possible while that process is underway.

Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability.

Use of the SAS Exam Centre requires students to make a booking at least 14 days in advance, and no later than November 1 (fall), March 1 (winter) or July 1 (summer). Similarly, new or changed accommodations for online quizzes, tests and exams must be approved at least a week ahead of time.

For Guelph students, information can be found on the SAS website https://www.uoguelph.ca/sas

For Ridgetown students, information can be found on the Ridgetown SAS website https://www.ridgetownc.com/services/accessibilityservices.cfm

7.6 Academic Integrity

The University of Guelph is committed to upholding the highest standards of academic integrity, and it is the responsibility of all members of the University community-faculty, staff, and students-to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff, and students have the responsibility of supporting an environment that encourages academic integrity. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

Undergraduate Calendar - Academic Misconduct
https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml

Graduate Calendar - Academic Misconduct
https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml

7.7 Recording of Materials

Presentations that are made in relation to course work - including lectures - cannot be recorded or copied without the permission of the presenter, whether the instructor, a student, or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

7.8 Resources
The Academic Calendars are the source of information about the University of Guelph's procedures, policies, and regulations that apply to undergraduate, graduate, and diploma programs.

Academic Calendars
https://www.uoguelph.ca/academics/calendars

7.9 Disclaimer
Please note that the ongoing COVID-19 pandemic may necessitate a revision of the format of course offerings, changes in classroom protocols, and academic schedules. Any such changes will be announced via CourseLink and/or class email.

This includes on-campus scheduling during the semester, mid-terms and final examination schedules. All University-wide decisions will be posted on the COVID-19 website (https://news.uoguelph.ca/2019-novel-coronavirus-information/) and circulated by email.

7.10 Illness
Medical notes will not normally be required for singular instances of academic consideration, although students may be required to provide supporting documentation for multiple missed assessments or when involving a large part of a course (e.g., final exam or major assignment).

7.11 Covid-19 Safety Protocols
For information on current safety protocols, follow these links:

- https://news.uoguelph.ca/return-to-campuses/how-u-of-g-is-preparing-for-your-safe-return/
- https://news.uoguelph.ca/return-to-campuses/spaces/#ClassroomSpaces

Please note, these guidelines may be updated as required in response to evolving University, Public Health or government directives.