Objectives
These research courses are 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.

Goals
The specific goals of these courses are to: (a) develop an appreciation for research, (b) improve library skills by researching the literature on a specific topic, (c) develop awareness of current research techniques, (d) develop the techniques and attitudes of critical thinking through evaluation of research data, (e) teach problem solving and (f) improve written and oral communications skills. The courses are designed to give the student a realistic view of research by providing an opportunity for “hands-on” research.

It is important to realize that these courses are at the undergraduate level. The research projects should be well-defined and have a reasonable likelihood of success. These courses are not mini-Masters and certainly should not involve a rigorous series of experiments. Students will not be penalized when 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.

Faculty and Student Commitments
Neuroscience minors may require one of the double-weighted courses for their programs. The ‘0-6’ and ‘0-12’ hr/week labels on the courses should be regarded as the minimum time commitment for students. In other courses, students are expected to work on course material after lectures and laboratories are finished. Research course students can expect that they will have to spend more than the listed time/week to complete their research work. Students may have to deliberately limit the time that they devote to these courses if they find the work particularly interesting or demanding. If a student feels that a problem is arising, he/she must talk to the supervisor about either becoming more efficient, or limiting the workload. Students should also feel free to talk to the course coordinator.

If a student wishes to perform their research off-campus, they must secure a co-supervisor who is a faculty member at the University of Guelph

‘Animal Utilization Protocol’ Approval
Some projects may require working with live animals. Faculty supervisors are responsible for obtaining the appropriate Animal Utilization Protocols to cover the work being done by Research project students under their supervision. Students should be aware of these protocols and understand their purpose. Discuss these with your supervisor.

Academic Misconduct
The University of Guelph has adopted a set of policy guidelines to deal with academic misconduct. Please see: https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml
It is the student’s responsibility to be aware of and follow these regulations.
**Course Evaluation**

Course evaluations will be turned on the last 2 weeks of classes - [https://courseeval.uoguelph.ca/CEVAL_LOGIN.php](https://courseeval.uoguelph.ca/CEVAL_LOGIN.php)

If you see ways that the course could be improved, please say so on the evaluation form. Your feedback is vital for us to assess the impact of the research courses and to fine tune the way we operate. This feedback will be provided to the course coordinator ONLY after the final grades have been submitted to the Registrar’s Office and will be used to make improvements to the course.

**Methods of Evaluation**

**NEUR*4450:**
- a) Formal Seminar Presentation - 30%
- b) Evaluation of your colleagues’ seminars (5 in total) – 5%
- c) Final Written Report in the form of a research project paper - 35% (2 reviewers)
- d) Assessment by the Supervisor* - 30%

**NEUR*4401**
- a) Interim Report - 1.5% (7.5% seminar and 7.5% written report) (1 reviewer)
- b) Evaluation of your colleagues’ seminars (5 in total) – 2.5%

**NEUR*4402**
- a) Formal Seminar Presentation (2nd semester) - 30%
- b) Evaluation of your colleagues’ seminars (5 in total) – 2.5%
- c) Final Written Report in the form of a research project paper - 30% (2 reviewers)
- d) Assessment by the Supervisor* - 20%

* The supervisor’s assessment might include factors such as: 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.

**The Interim Report**

Students taking the two semester course will be required to provide an interim report for the first semester on their progress to-date. This report consists of two components: an oral presentation (a 5 minute PowerPoint presentation followed by 5 minute question period) on one of the regularly scheduled seminar days for that semester and a written (2 page single spaced report) provided to the supervisor on the same date that all final reports are due to be handed in to supervisors. The purpose of the interim report is primarily to identify the objectives/hypothesis being tested in the research project, the research protocol for the project and any progress to date. The formal seminar given in the second part of the course (NEUR*4402) concentrates more on the results and discussion of the overall project.

**The Formal Seminar**

All students are required to give an oral presentation. This formal seminar will be presented using the 10/5 format commonly used in scientific meetings - a 10 minute presentation and a 5 minute question period. (NEUR*4401 – 5 minute presentation and 5 minute questions period) The emphasis in the presentation, and in the evaluation, should be on development of logical ideas and on effective communication. The presentations will be timed, and must be saved in PowerPoint.
Ideally, the seminar should include the following components:
1. An Introduction - general terms to orient the audience and provide background information.
2. Objectives/Hypothesis - 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.

**Seminar Preparation**
Practice rehearsal times will be available the week before the seminars, and a sign-up sheet will be placed on the door a day or two before rehearsals begin. An e-mail will be sent out indicating when this is available.

Students are required to submit their presentation for uploading, with the deadline being 8a the day of the presentation. If not received by 8a, 5% will be deducted from your final grade.

Students are strongly encouraged to verify the performance of their presentation on the classroom computer during rehearsal time. Supplemental audiovisual aids are NOT permitted and “presenter view” will not be available. The presenter must keep in mind the time restrictions for the seminar. The presentations will be timed.

**Seminar Presentation**
Specific days have been designated for the seminar presentations. After soliciting student/supervisor input (Seminar Questionnaire), a presentation scheduled for a specific morning(s) and/or afternoon(s) will be provided. Interim Seminars will be scheduled at 10 minute intervals and Final Formal Seminars will be scheduled every 15 minutes, with every attempt being made to accommodate your first choice of day/time (am/pm). It is important that your presentation be thoroughly rehearsed to ensure that it meets these time restriction. Presentations will not be allowed to run overtime.

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 evaluations for their peer presentations each semester. These evaluations must have the evaluator’s name clearly printed on the bottom of the page to receive the full marks assigned for peer review. All present in the audience will be asked to evaluate and grade each seminar. Only seminar scores provided by the faculty present will be used in determining the grade for the presentation. All evaluation forms will ultimately be returned to the student and their supervisor, and the supervisor will be expected to review these with the student as a means of providing feedback on the oral presentation.

**The Final Written Report**
The date given for the final written report on the experimental project is given as a guideline (Semester Deadlines). The report can be submitted electronically or in paper format (depending on the supervisor’s preference) for assessment by the supervisor and by a second senior reviewer not from their laboratory - chosen by the supervisor. **An alternate due-date can be agreed upon by the student and supervisor - as long as both evaluators have sufficient time to grade the paper. Marks MUST be submitted to the course coordinator no later than the date indicated on the Current Semester Deadlines page.**

Reports should be written in the format of a Neuroscience journal of the supervisors 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 once, 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 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.
A CHECK-LIST FOR STUDENTS

1. When the semester begins, students should contact their supervisor and begin working on their laboratory project according to his/her directions.

2. Arrange a time each week to meet with your supervisor to discuss your progress.

3. You need to discuss 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. Students taking NEUR*4401 should indicate that this will be the interim report. If this questionnaire is not received by the date in the deadline dates, 5 marks will be deducted from your seminar.

4. All final seminar presentations will be uploaded to V drive. The deadline to submit your presentation, for uploading, is 8a the day of your presentation (saved in PowerPoint). (You will lose 5% off your final grade if past the deadline)

5. Preview your completed computer-generated presentation with your supervisor. A sign-up sheet will be posted on the seminar room door several days before the practice times are scheduled.

6. You are expected to participate and critique your colleagues’ presentations. Evaluation forms for everyone in your group must be completed and submitted. These evaluations must have the students name clearly printed on the bottom to get the full marks.

7. Complete a course evaluation on-line during the last 2 weeks of classes.

8. A preliminary draft of your experimental project report should be submitted to your supervisor for general comments and feedback before the final copy is submitted. Allow time for this to occur. The final research project report is due to your supervisor on the specified day indicated in semester deadlines (see Semester Deadlines – use date as a guideline).

8. Direct questions or concerns to the course coordinator:

   Dr. Craig Bailey: OVC Room 2602, baileyc@uoguelph.ca
   or
   Kim Best: OVC Room 2633, kbestb@uoguelph.ca
1. Please read section on course objectives and goals. Students may do a laboratory research project double weighted in a single semester or single weighted in each of 2 adjacent semesters.

2. In the initial meetings with your student, focus on opening up lines of communication as regular one-on-one meetings with a professor may be a new experience for students. Discuss your expectations of the student and be sure to clearly identify the criteria you will use in assessing the student’s performance (i.e. the supervisor’s assessment component of the overall evaluation). Discuss with NEUR*4401/2 students, the requirements for the interim report (oral and written format).

3. Arrange regular meetings with the student to discuss progress, assign tasks, or just have a short chat. Try to monitor regularly the time that your student is spending on the course.

4. Discuss the questions posed on the Seminar Questionnaire that needs to be handed in by the specified deadline. Supervisors (or a designate if the supervisor is not available*) are expected to attend their student’s oral presentation and to help evaluate other seminars in the time block selected. *they must identify themselves

5. If you have to be away from campus for a significant period of time, arrange for the supervision of your student in your absence.

6. Preview your student's presentation before seminar. Practice times are scheduled during the week preceding the seminars. The emphasis should be on a clear development of ideas relating to their project.

7. Discuss the seminar evaluations with your student when they are returned to you.

8. Be prepared to help your student meet your expectations if he/she is spending considerably more than 6 or 12h/wk on assigned tasks. A high standard needs to be maintained but the students also have to balance their research project with multiple other courses. These courses should not develop into high pressure stressful exercises that put students off of research.

9. Provide specific comments when your student asks you to review the preliminary draft of the final report. We help MSc and PhD students in such a way and should also be prepared to provide similar feedback to fourth-year research project students.

10. The student's final report (please indicated preference for paper or electronic version) is due in your hands by the specified deadline (use date given as a guideline). Find a senior colleague (not from your lab in order to provide independent objective assessment) to mark the second copy of the report. You will submit the two individual grades out of 100%.

11. Marks must be submitted to the course co-ordinator by date given on Current Semester Deadline Dates. All marks should be out of 100%. We will calculate the final grade.

12. Direct questions or concerns to the course coordinator: Dr. Craig Bailey: OVC Room 2602; baileycc@uoguelph.ca or Kim Best: OVC Room 2633, kbestb@uoguelph.ca

Last update: July 2017