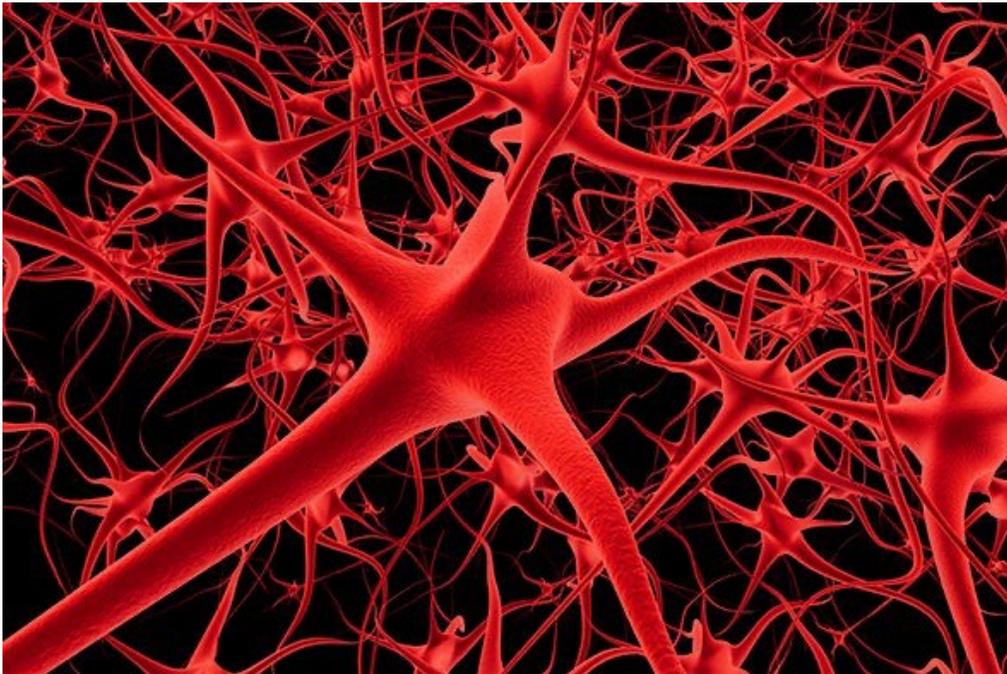


BROCK UNIVERSITY

CENTRE FOR NEUROSCIENCE

Guidelines for
NEUR 4F90 – Honours Thesis and
NEUR 4F91 – Literature Research and Seminar

June 2022



BROCK UNIVERSITY
Centre for Neuroscience

GUIDELINES FOR HONOURS THESIS PROJECTS
NEUR 4F90/4F91

CONTENTS:	Page #
Guideline Topics:	
1. Admission of Students to NEUR 4F90/4F91	3
2. Responsibilities of the Supervisor and Committees	3
3. Schedule and Deadlines	5
4. Deadline dates and NEUR 4F90/4F91 Taken Outside the Normal Academic Year	6
5. Evaluation	7
6. Thesis Format	9
7. Instructions for the Preparation and Submission of BSc Honours Theses	9
8. Submission Process	10
9. Budget and Supplies	11
10. Appeals	11
11. Graduation	11
Appendix:	
A. Admission to Year IV program – Forms	12
B. Midterm Progress Report - Form	13
C. Grade Sheet	16
D. In Progress Grade Form	18
	19

GUIDELINES

1. ADMISSION OF STUDENTS TO NEUR 4F90/4F91:

(a) All students registering for NEUR 4F90 must also register for NEUR 4F91 at the same time. Forms to be completed: (i) Application to Year 4 Studies; (ii) NEUR Override – Faculty Agreement Form; (iii) NEUR Intellectual Property Form.

Forms can be found here: <https://brocku.ca/mathematics-science/neuroscience/student-resources/#Year4Forms>. Once completed, submit electronically to the Administrative Assistant.

(b) Admission of students to the 4F90/4F91 program will normally require the achievement of an overall 70% major average in Neuroscience, an overall average of 60% and a minimum of 13 credits. However, preference for admission will be given to students whose major average is 75% or greater. The Program Faculty will attempt to accommodate all students who wish to enroll in the 4F90/4F91 program.

(c) Year IV students who do not meet the above standard may be admitted to NEUR 4F90/4F91 at the discretion of the Director and the supervising faculty member, to the extent that space and facilities permit.

(d) Students will be supervised by faculty listed as participants in the Neuroscience Program. Other faculty members may act as co-supervisors, provided this is agreeable to the Director of the Centre for Neuroscience.

(e) Every faculty member has the right to not accept a student for supervision, depending on time or resource constraints or compatibility of research interests.

(f) A 4F90/4F91 student shall not normally be paid by the supervisor for work done towards the thesis.

(g) Faculty will not normally supervise NEUR 4F90/91 students while on sabbatical.

2. RESPONSIBILITIES OF THE SUPERVISOR AND COMMITTEES:

The thesis program has been instituted primarily to provide Honours students with significant experience in the investigative process. Although it is undesirable to legislate formal regulations regarding the responsibilities of supervisors and committees vis-à-vis students, some guidelines are appropriate.

Supervisor

(a) Thesis projects should be suitable for illustrating the entire research process, from the formulation of hypotheses through to the decision-making steps and the communication of results. They should be real problems and not primarily isolated aspects or technical problems associated with the supervisor's personal research program.

(b) The supervisor will advise the student regarding the University's policy on ownership of student-created intellectual property. This policy will be discussed, so that the student understands it, and the required form will be completed and forwarded to the Centre for Neuroscience before the student's experimentation begins (article 1(a) above).

(c) BSc projects are not the equivalent of MSc studies and their principal goal is not the publication of a research paper. Consistent with the aim of the 4F90/4F91 program, they should be well defined and relatively limited in scope. Open-ended projects should not be encouraged and every effort should be made to avoid studies that are unlikely to yield results within the time period available.

(d) Since Year IV students cannot ordinarily be expected to have the background knowledge necessary to formulate a research hypothesis and then to design the studies necessary to test it, supervisors should work closely with their students in this phase of the study, and also assist in the development of analytical, observational and related procedures. Previous experience suggests that most students have difficulty in setting up realistic experimental schedules. Supervisors should help with this and ensure that such schedules are followed.

(e) Since most students require assistance in the organization of their reports, a schedule has been defined which provides time for the student to prepare and submit more than one thesis draft. Supervisors should ensure that the drafts are of reasonable quality with respect to style, organization, etc., before final submission.

(f) The most important part of the learning experience of these courses is data analysis, interpretation of results and the integration of these into the current scientific thought. Since this is the ultimate reason for doing research, it is very important that students be guided through this process by the supervisor and shown how this is accomplished.

(g) The duties of the supervisor cease with the final submission of the thesis when he or she reverts to membership of the examining committee.

N. B.: No thesis investigation will normally be initiated before commencement of the term for which the student is registered (e.g., September, January, May). Students may carry out projects in the laboratories of faculty members for whom they have worked as summer research assistants but will not normally use, for a thesis, any data or material obtained during the tenure of such an appointment. Moreover, no Year II or Year III student may be hired as a research assistant with the understanding that he or she is then obligated to carry out a thesis project under the supervision of the faculty member concerned.

Committees

Each student registered for the thesis program will have two members on their advisory/examination committee. The committee will consist of the Supervisor of the project and one other faculty member (Second Reader) who (preferably) has relevant experience in the research area of the project. Committee members should be available for consultation throughout the project. This arrangement will not preclude the student seeking advice from other faculty members. The member who is not the Supervisor will serve as the Chair of the Committee. The same committee will examine and evaluate the thesis.

3. SCHEDULE AND DEADLINES:

Schedule:

(a) Each member of the Centre for Neuroscience is expected to participate in the NEUR 4F90/4F91 program and will indicate to the Director in the winter term the areas in which he/she will supervise projects. All interested prospective Honours students are advised to begin communications with prospective supervisors during the winter term.

(b) Each student participating in the program will be required to make his/her own arrangements with a supervisor, complete the admission and intellectual property form and to register these with the Director and/or Administrative Assistant prior to being given override permissions for the 4F90 and 4F91 courses.

(c) In the third month of the thesis, each student will complete and submit a Progress Update Report (see Appendix; form available online) to your Supervisor and Second Reader and cc'd to the Director and NEUR Administrative Assistant.

(d) The final aspect of the thesis experience involves a seminar and defense that will normally be held within two to three weeks after final submission of the thesis. The seminar may be open to the public (lab colleagues, friends, etc.).

(e) For the seminar, the student will be expected to outline the problem, its background, the design of the study and results obtained and to discuss the conclusions. The seminar should not exceed 30 minutes followed by a 10-minute Q&A session from the audience. A defence of the thesis will follow in a closed session with the examining committee and should not exceed 60 minutes. The total final examination process should not exceed ~90 minutes.

Deadlines:

(a) Thesis work is typically completed over a period of 2 terms. However, if more time is needed, students may take an additional term to complete their thesis work. Please see (d) below for more information.

(b) Submission of a thesis draft to the Supervisor should occur at least two weeks before final submission to committee members for examination. This should allow sufficient time for revisions prior to final submission.

(c) The deadline for final submission of the thesis manuscript to committee members for examination should normally occur two to three weeks before the scheduled oral examination. The deadline for final submission of the thesis (after the examination and after any required corrections are completed) to the Administrative Assistant for the Neuroscience Program should be no later than two days after the oral examination.

(d) For all thesis students, this deadline can be extended to the end of the next semester (e.g., August for those attending convocation in the Fall); however, it is important that the student discuss this option with their Supervisor. This choice will be acknowledged by the Supervisor submitting an "IP" (In Progress) grade by the end of the second term of thesis work. The Supervisor must fill out the In Progress Grade Forms (one per course) and send them to the Administrative Assistant.

For Supervisors: *The IP grade will become the default grade should the student fail to complete their thesis requirements within the one-year deadline. As such, supervisors are advised to use the following guidelines when considering the IP grade allocated to the student after 2 terms:*

- *50% - concerns that the student is falling behind or may not complete the thesis and/or examination as expected within the one-year period*
- *60% - substantial progress has been made but there are some minor concerns about effective completion of the thesis and/or examination*
- *70% - substantial and excellent progress has been made and the student is on target to complete the thesis and examination within the one-year period*

(e) Once the final thesis for examination has been submitted to the Supervisor and 2nd Committee Member, this version will be graded, as submitted, by the Examination Committee. Only minor grammatical corrections are permitted following the oral examination and defence.

N.B.: See the table on the next page for a complete list of deadlines by term. Note that dates may vary slightly from year to year due to holidays/weekends etc.

4. DEADLINE DATES and NEUR 4F90/4F91 TAKEN OUTSIDE THE NORMAL ACADEMIC YEAR:

As intimated above, 4F90/4F91 may also be initiated either during the Winter (January) or Spring (May) terms. All regulations apply with the deadlines for processing to be adjusted according to the start date.

If it is known in advance that a full year will be required, due dates should be adjusted accordingly based on the cohort ending at the one-year mark (e.g If a Sept start and taking one year to complete – use the deadlines in the Jan to AUGUST cohort).

Please note – an IP Grade Form will need to be submitted for each course at the end of the first semester for students beginning their thesis work in January or May.

September to April Cohort			
Item	Due Date	Format	Submit To
Progress Report	November 30 th	Word	Supervisor & 2 nd Reader Cc'd to Director & Administrative Assistant
Thesis Draft	~End of March	Word or Printed	Supervisor
Version for Examination	~April 12 th	Word or Printed	Supervisor & 2 nd Reader
Seminar & Oral Defence	By April 30 th		
Final Version & Grades Due	April 30 th – May 3 rd	PDF	Supervisor & Administrative Assistant

January to August Cohort			
Item	Due Date	Format	Submit To
Progress Report	March 30 th	Word	Supervisor & 2 nd Reader Cc'd to Director & Administrative Assistant
Thesis Draft	~End of July	Word or Printed	Supervisor
Version for Examination	~August 12 th	Word or Printed	Supervisor & 2 nd Reader
Seminar & Oral Defence	By August 30 th		
Final Version & Grades Due	August 30 th – September 3 rd	PDF	Supervisor & Administrative Assistant
May to December Cohort			
Item	Due Date	Format	Submit To
Progress Report	July 30 th	Word	Supervisor & 2 nd Reader Cc'd to Director & Administrative Assistant
Thesis Draft	~3 rd week of November	Word or Printed	Supervisor
Version for Examination	~December 1 st	Word or Printed	Supervisor & 2 nd Reader
Seminar & Oral Defence	By December 20 th		
Final Version & Grades Due	December 23 rd – January 3 rd	PDF	Supervisor & Administrative Assistant

5. EVALUATION:

(a) A Word version (or hard copy if requested) of the final thesis must be submitted for examination to the Examining Committee (the Supervisor and the Second Reader).

(b) The Examining Committee will grade the thesis on Research Quality and Performance (4F90) and Library Research and Communication (4F91).

(c) The seminar presentation with a question period defence (not to exceed 90 minutes) will normally be held within a three-week period after submission of the thesis. This closed oral defence with the student and Examining Committee will consist of questioning by committee members which will pertain to the thesis topic, but students should also anticipate questions on the theoretical basis and appropriateness of methodology used and also on the broad ramifications and significance of their topic. Grades worth 30% of 4F90 (Research Quality & Performance) and 30% of 4F91 (Communication) will be assigned to the seminar presentation and defence.

(d) A grade of 20% for both 4F90 and 4F91 will be assigned based on the Supervisor's overall evaluation of the student through the entire duration of the course.

(e) Marks assigned to the seminar and the defence, as well as the evaluation grades from the Supervisor are to be registered, in writing, with the Chair of the Examination Committee immediately following termination of the final defence of the thesis. The marks assigned by individual committee members for the thesis and final seminar and defence will have equal weight. These grades must be submitted immediately to the Director and Administrative Assistant.

NEUR 4F90/4F91 FINAL MARK ALLOCATION

<i>NEUR 4F90 - 'Research Quality & Performance'</i>			
<i>FINAL MARK ALLOCATION</i>	<i>Supervisor</i>	<i>Committee Member</i>	<i>Totals</i>
<i>Thesis</i>	25%	25%	50%
<i>Final Seminar & Defence</i>	15%	15%	30%
<i>Supervisory Assessment</i>	20%	-----	20%
<i>Total</i>	60%	40%	100%

<i>NEUR 4F91 - 'Library Research & Communication'</i>			
<i>FINAL MARK ALLOCATION</i>	<i>Supervisor</i>	<i>Committee Member</i>	<i>Totals</i>
<i>Thesis</i>	25%	25%	50%
<i>Final Seminar & Defence</i>	15%	15%	30%
<i>Supervisory Assessment</i>	20%	-----	20%
<i>Total</i>	60%	40%	100%

(f) For purposes of grade submission to the Registrar, two separate grades will be assigned, one for NEUR 4F90 and one for NEUR 4F91.

(g) The mark assigned for NEUR 4F90 will reflect the research quality of the thesis document and should be based on the material in the thesis document, the student's performance on the research project, the writing of the thesis and the defence of the thesis during examination.

(h) The mark assigned for NEUR 4F91 will reflect the communicative abilities of the student and the thoroughness of their library research and knowledge. This will be based in part on the thesis and in part on the seminar presentation and defence.

(i) All grades, including the individual mark assignments of committee members, must be returned to the Director (organized as above) and cc'd to the Administrative Assistant if submitted electronically. Grade sheets are available online and attached to the appendix of this document.

(j) Final grades will not be transmitted to the Registrar until a corrected copy/final version of the thesis is provided as a PDF to both the Supervisor and the Administrative Assistant. The Administrative Assistant must be provided confirmation by the Supervisor that they have received all the raw and compiled data from the student prior to grade submission and that lab keys have been returned.

6. THESIS FORMAT:

It is suggested that all theses follow a format similar to the following:

- (a) Title Page
- (b) Acknowledgments
- (c) Abstract
- (d) Table of Contents & Lists of Tables, Figures. Abbreviations (if necessary)
- (e) Introduction and Literature Review (combined or separate sections): concisely outline the research problem/question, rationale for the study, the goal or hypothesis, and the approach used
- (f) Materials and methods
- (g) Results
- (h) Discussion
- (i) Summary and Conclusion
- (j) Literature Cited
- (k) Appendices

7. INSTRUCTIONS FOR THE PREPARATION AND SUBMISSION OF NEUR 4F90/4F91 BSc (HONOURS) THESES

Document

1. Formatting consists of 8.5 x 11 inch pages, with 1" margins on all sides, drawings and maps excepted. All theses should be typed and use a common font (such as Times New Roman), 12pt, and double-spacing. Tables and references may be single-spaced. The entire thesis should not be longer than ~50 pages.
2. All costs of preparing the thesis are the responsibility of the student.

Format

A. Preliminary Pages

1. **Title page.** The title page must include the full title of the thesis, the candidate's name in full, the name(s) of the supervisor (and co-supervisors if applicable), the degree expected, the title of the department and the year of submission. Second Readers need not be named.
2. **Abstract.** The abstract should be a summary of the thesis outlining the problem, the methods of investigation, the main results and the general conclusions. It should not normally exceed 200 words and should normally be limited to one page.
3. **Acknowledgments.** This section should be a brief acknowledgment of assistance given to the candidate during the research and writing.
4. **Table of Contents.** This should set forth all the principal topics or subdivisions of the thesis.
5. **List of Tables**

6. **List of Figures:** This should include separate lists of all figures, plates, and maps.
7. **List of Abbreviations** (if appropriate).

B. Text. Although the following sections may not be applicable to all theses, they are offered as a guide. Students should follow a format appropriate to the Supervisor's department.

1. **Introduction and Literature Review** (combined or separate sections). The introduction to a thesis should normally present the purpose, methods and scope of the study followed by a survey of the literature pertaining to the subject of the investigation. This should not normally exceed ~15 pages.
2. **Methods.** This section should present a detailed account of all methods used in the investigation.
3. **Results.** All results to be presented in the thesis must be given in this section together with any explanations that are necessary. Each figure number and legend should appear on the same page as the figure and be placed under the figure at the bottom of the page.
4. **Discussion and Conclusions.** A discussion of the results obtained in the investigation and a summary of the candidate's conclusions should be given in one final section, or may be presented in two separate sections. Students should avoid merely repeating their findings in this section. Rather, they should attempt to discuss the implications of their results, how they relate to the literature, and discuss any limitations of the study as well as any possible future direction.
5. **Footnotes.** A consistent style for footnotes, approved by the host department, must be followed throughout the thesis.

C. Literature Cited.

The citation of the literature is a very important part of a thesis and care should be given to its preparation. The general form of each citation and the method of abbreviating names of periodicals should be the same as that used in an appropriate form as permitted by the host department.

8. SUBMISSION PROCESS:

Following final correction(s) after the exam, a student submitting a BSc (Honours) thesis for degree credit must ultimately submit **one electronic pdf copy** of their approved thesis to the Administrative Assistant of the Centre of Neuroscience before the degree will be conferred. The thesis shall be a report of research work carried out during the candidate's final year. The following regulations are provided for the guidance of students and faculty.

1. A copy of the thesis must be submitted as a Word document (note: Some committee members may require a printed hard copy) to the Supervisor and the Committee member for examination.

2. **Faculty approval and disposition of the thesis after the defence.** When the final corrections to the thesis are approved by the Supervisor on behalf of the Examining Committee, the candidate shall submit an electronic pdf copy of the approved thesis to the Administrative Assistant of the Centre for Neuroscience. As noted, this copy must be corrected of any errors noted by the examiners and must contain all charts, maps, figures, tables, and appendices as finally approved.

Any student who does not submit the final version will receive an "In Progress" (IP) grade for 4F90 and 4F91 and will be permitted an extra term to submit the document (with permission of the Supervisor and Director), at which time a default grade will be submitted to the Office of the Registrar.

Students will also be required to return all keys that were signed out to their supervisor.

In addition, the student and supervisor must provide confirmation that the supervisor has received all raw and collated data associated with the research.

Students wishing to have copies professionally bound (hard cover) must do so at their own cost, but will be provided instructions on how to do so by the Administrative Assistant

3. **Rights to lend and reproduce the thesis.** Unless there is a specific arrangement to the contrary, the university will allow the thesis to be consulted or borrowed or to be used in whole or in part.

9. BUDGET AND SUPPLIES

(a) Any budget for materials and supplies will be as a function of the policies within the Supervisor's home department.

(b) A withdrawal record sheet will be maintained for each project in Science Stores. Withdrawal from stock and all purchase orders must be authorized by the Supervisor. Students will be held accountable and responsible for all equipment and unused supplies which are to be returned in clean condition to the Storeroom prior to the thesis defence.

10. APPEALS:

It is recognized that under some circumstances students may wish to appeal a final grade. In such instances, University policy will be actioned.

11. GRADUATION:

Students intending to graduate must complete an "application to graduate". These applications are available through the Office of the Registrar and must be submitted to them by the dates as indicated.

Appendix

A. ADMISSION TO YEAR IV PROGRAM – 3 FORMS

- a. Application to Year 4 Studies**
- b. Override for NEUR 4F90 and 4F91**
- c. Intellectual Property Form**

B. MIDTERM PROGRESS REPORT

C. NEUR 4F90/91 FINAL GRADE SHEET

D. IN PROGRESS GRADE FORM

N.B. ALL FORMS ARE TO BE SUBMITTED ELECTRONICALLY AND ARE AVAILABLE AT <https://brocku.ca/mathematics-science/neuroscience/student-resources/>



CENTRE FOR NEUROSCIENCE

OVERRIDE FOR NEUR 4F90, NEUR 4F91 AND NEUR 4F92 STUDENT/FACULTY AGREEMENT FORM

Name: _____ Signature: _____

Student Number: _____ Telephone Number: _____

Email Address: _____

Date: _____

Topic: _____

Supervisor's Name: _____ Signature: _____

Term: Fall Winter Spring

Year: _____

COURSE	NUMBER	DUR	SEC	COORDINATOR'S SIGNATURE
NEUR	4F90	_____	_____	_____
				Print name/Signature
NEUR	4F91	_____	_____	_____
				Print name/Signature
NEUR	4F92	_____	_____	_____
	<input type="checkbox"/>	<input type="checkbox"/>		Print name/Signature

Submit this form to the Administrative Assistant for the Centre for Neuroscience MC F218; neuroscience@brocku.ca

Students must register using the web registration system after the override has been processed and entered into the system.

This form is to be completed after your application to Year 4 Studies has been signed, accepted and in your file at the Office of the Registrar updated.

Your signature certifies that you and your student have met and discussed a mutually agreeable project for NEUR 4F90/91 thesis or a NEUR 4F92 research essay.

For Forms and Guidelines visit: <https://brocku.ca/mathematics-science/neuroscience/student-resources/>



**BROCK UNIVERSITY
INTELLECTUAL PROPERTY FORM**

Please complete this form and return one copy with signatures to the Office of Research Services prior to commencing any research under the auspices of Brock University.

Student Name: _____ **CENTRE FOR NEUROSCIENCE**

Student Number: _____ **Email:** _____ **Telephone ()** _____

NEUR 4F90

NEUR 4F91

NEUR 4F92

I have read the document "Ownership of Student-created Intellectual Property" and agree to comply with the Brock University's guidelines on Intellectual Property contained therein.

Research results. I acknowledge that a complete set of all original research data will be retained by the Principal Investigator for the period of at least 5 years or for 5 years from the date of publication of results based on the data, and that research collaborators will have free access to the relevant data at all times. Unpublished data are regarded as confidential.

Authorship Acknowledgment. I understand that all members of the research group are responsible for ensuring proper acknowledgement of each member when that data are released in any form. The inclusion of Student's name as a full co-author or as an acknowledged participant in the resulting publication, if any, is in the discretion of the Principal Investigator and is dependent on the magnitude and merit importance of the Student's contribution.

Order of authorship. If the results can be published, I also recognize that the order of names on publication is dependent on the contribution made by each individual involved in the research in terms of conceptualization, development of research design, data collection, data analysis, data organization and interpretation, and writing the manuscript. I acknowledge that discussion about explanations regarding order of authorship with Principal Investigator should be updated at the end of the project so that everyone's understanding and expectations with respect to acknowledgements are discussed after completion of the project but prior to publication.

If some specific understanding regarding intellectual property or order of authorship has been reached that is not covered in the above principles, please indicate that below.

Researcher's signature _____ Date: _____

Supervisor's signature _____ Date: _____

Co-Supervisor's signature _____ Date: _____

RESEARCH STUDIES

Approval (required if specific arrangements are proposed)

Associate Vice-President Research: _____ Date: _____

Copies to: Centre for Neuroscience & Research Services

NEUR 4F90/1 – Empirical Thesis Midterm Progress Report

Name: _____

Student Number: _____

NEUR 4F90/1 Supervisor: _____

Please provide the following information:

<p>2nd Reader (in consultation with Supervisor)</p> <p>Choose one</p>	<p>YES</p> <p>Reader Name:</p> <p>_____</p>	<p>NO (Circle one)</p> <p>a) Still being arranged;</p> <p>OR</p> <p>b) Would like Coordinator to assist in identifying a reader</p>

Please complete the following:

Title: _____

Thesis Statement: _____

(continued on next page)



CENTRE FOR NEUROSCIENCE 4F90 & 4F91 GRADE SHEET

Student name and ID: _____

Supervisor: _____

Signature: _____

2nd Reader/Committee member: _____

Signature: _____

Date of thesis defence: _____

GRADES:

NEUR 4F90 – Research Quality & Performance

	<i>Supervisor</i>	<i>Committee Member</i>
<i>Thesis</i>	_____ (25%)	_____ 25%
<i>Final Seminar & Defence</i>	_____ (15%)	_____ 15%
<i>Supervisory Assessment</i>	_____ (20%)	
TOTAL: _____ (100%)		

NEUR 4F91 – Library Research & Communication

	<i>Supervisor</i>	<i>Committee Member</i>
<i>Thesis</i>	_____ (25%)	_____ 25%
<i>Final Seminar & Defence</i>	_____ (15%)	_____ 15%
<i>Supervisory Assessment</i>	_____ (20%)	
TOTAL: _____ (100%)		

SUBMIT AN ELECTRONIC COPY TO THE DIRECTOR AND NEUROSCIENCE ADMINISTRATIVE ASSISTANT

Gaynor Spencer (gspencer@brocku.ca; MC F222)

Jennifer Smith (jsmith2@brocku.ca; MC F218)

