

Guidelines for the Preparation of and Regulations for the Examination of the B.Sc. (Hons.) Dissertation.

Department of Biochemistry

The honours research project is intended to provide each student with an opportunity to experience research - and all of its attendant trials and tribulations; you should learn what research is really all about. Your project should have a definite beginning and an end. It is better to reach the initial goal quickly and then be able to try for a new one rather than be frustrated in trying to reach one that is over-ambitious. After all, you have limited time to work in the laboratory. In principle, the honours project should require the equivalent of one day's work per week.

(A) Preparation - General

The honours dissertation is a formal written report of the work performed in Biochemistry 499A/B or 4999. Since a dissertation is a formal publication of work that will be available for reference in the University Library, the standards of writing and presentation of the dissertation are the same as those that apply to any scientific publication.

The honours dissertation is, in effect, an extended paper. You should consult the 'Instructions to Authors' from an appropriate and reputable scientific journal for guidance when preparing the dissertation. A list of some suitable journals is given in Section (H).

When writing the thesis, use plain English and avoid using laboratory jargon. Write things out in full; it is easier to condense a long section of text than it is to write a whole new section - especially at the end of the semester.

There are no minimum or maximum page-limits to the dissertation. The number of pages will largely depend on the nature of the problem that has been studied and the number of Figures and/or Tables that are required to report the results. However, the Introduction should not exceed 10 pages (double spaced) and, in general, the dissertation will consist of approximately 45-50 pages.

Students in Biochemistry 499A/B are strongly advised not to leave the preparation of the thesis to the end of the second semester of registration - you will find that you have run out of time. You are encouraged to prepare the Materials and Methods section as you learn and practice the techniques that are required in your project. You should definitely write the Introduction as soon as you are knowledgeable and comfortable with your project; it may help you to understand what your project is all about! *You are required to submit a draft version of your Introduction to your supervisor in order to receive a mark for Biochemistry 499A.* Finally, you must start to prepare your Figures at the beginning of the second semester.

Note: The costs of copying the thesis, at both the initial and final submission stages, is the responsibility of the student not the Supervisor.

(B) Preparation - Specifics

The dissertation should be typed or printed on one side of the page only and should be double-spaced throughout. Margins should be 1 inch on all sides except that on the side which will be bound which should have a 1.5 inch margin. Normally this will mean a 1.5 inch left margin on all pages unless those pages containing figure legends facing the corresponding figures in which case the right hand margin will be 1.5 inches. This requirement also applies to Figures and to Tables.

The type used must be of high quality in an easily readable font no smaller than 12 pitch or 10 point in size. A laser-printed thesis must use 300 dpi laser printing.

Pages should be numbered in Arabic numerals with the first page of the Introduction as page 1. Any pages before this including the Abstract, the various Lists and the Acknowledgments should be numbered with small Roman numerals.

It is not usual to make extensive use of footnotes in scientific writing. Their use is generally discouraged and their number should be kept to a minimum.

The dissertation should consist of a Title (or Cover) Page, an Abstract or Summary, an Introduction, Materials & Methods, Results, Discussion and References. Appropriate Figures and/or Tables that report the results obtained should be included.

Title Page

The first page of the dissertation should contain the title of the thesis, the name of the author, a statement that it is "A dissertation submitted in partial fulfillment of the requirements for the degree of Bachelor of Science (Honours) in Biochemistry (or Nutrition or Dietetics as appropriate)", the name of the Department and University and the date (month and year) of submission. A sample page is appended for guidance.

Abstract or Summary

The Abstract is a brief (maximum 250 words) summary of the work reported in the dissertation. It should clearly relate the problem, methods, results and conclusions reported in the thesis. It should be completely self-explanatory. Abbreviations should be avoided.

Frontispiece

The Abstract should be followed by (i) Acknowledgments or Dedication (if desired), (ii) Table of Contents, (iii) List of Figures, (iv) List of Tables, and (v) List of Abbreviations.

Each Chapter, Section and Sub-Section should be numbered and titled. These numbers and titles should be listed in the Table of Contents with their respective page numbers (see above for notes on page numbering). The titles that appear on this page should be identical to those used in the text. A sample Table of Contents is appended for guidance.

The List of Figures and List of Tables should contain the number and title of each Figure or Table exactly as it appears in the text together with its respective page number.

All abbreviations used in the text must be included in a List of Abbreviations. Standard or common scientific abbreviations need only be listed here and may be used directly in the text. Such abbreviations must conform to a recognised system of abbreviation. Non-standard abbreviations and abbreviations that are unique to the dissertation must be written in full the first time they appear in the text as well as being included in this list.

It is customary (but not required) to include a section acknowledging the roles of the various people who have helped you to accomplish the work reported in the dissertation. This should include your

supervisor who provided the guidance, laboratory, and supplies necessary for the work. It may include other labmates, classmates, friends, relatives and significant others as you choose. The acknowledgment is a personal statement and may be as brief or as long as you wish.

This section should not be inserted in the copy of the thesis submitted for examination; it should be included only in the final corrected copy of the thesis when it is submitted.

Introduction

The Introduction should present the background to the research problem that is tackled in the thesis. This should not exceed ten pages. This section should conclude with a specific statement of the goals of the thesis.

Materials and Methods

The scope of this section will vary from thesis to thesis and will depend on the type of project undertaken. In principle, all of the methods used in the thesis should be reported so that anyone else could repeat the work just by reading the thesis. In practice, this is often not necessary. In many cases, standard techniques will be used that are well described in laboratory manuals or in the literature. In such cases it is not necessary to describe the methods in detail unless they have been modified. If, however, a particular technique is central to the work reported then that technique should be reported in detail. Some complex procedures involving many simpler steps can be reported in outline.

You are advised to consult with your Supervisor at an early stage to discuss the scope and content of this section of the thesis.

Results

When reporting your results, you will need to present them in context. It is sometimes difficult to distinguish between text that belongs in this section and text that belongs in the Materials & Methods section. Similarly, it can also be difficult to distinguish between text that belongs in this section and text that belongs in the Discussion. *There is an easy way to determine the answer to these questions. Write the thesis early. Read it. Then revise it in light of what you have written.* You should also ask your supervisor for advice.

Discussion

You should discuss the significance and interpretation of your results, not simply report them again. It is often appropriate to put secondary analysis in this section.

This section should conclude with a short discussion of the future experiments or questions that could be addressed as a result of your work.

References

Preparing the references is usually the most painful part of scientific writing. It can be even more painful to have to revise all of the references and citations in a thesis if you don't do them right the first time. You should, therefore, decide on a style of citation and reference early on in the preparation of your thesis. Select a style used by an appropriate and reputable journal such as one of those listed in the Section (H). It is strongly recommended that you use a style of reference that includes the full titles of all referenced manuscripts.

Note: the style used by Science or Nature is not suitable for a thesis.

You must use the correct abbreviations for journal titles in your list of references. Consult the reference section of an appropriate journal for guidance.

Hint: using a style citing the name of the author and year of publication in the text is the least painful method for preparing references in the long run.

Figures and Tables

Preparing the Figures can be the most time-consuming part of thesis preparation. Figures that are prepared from photographs may take up to three weeks to prepare. At the start of your second semester, therefore, you must develop a firm idea of the nature of the figures that you intend to include and you must start their preparation.

All of the figures in the thesis must be properly labelled!

Figures and Tables should be placed immediately after the page on which they are first referenced. Yes!, this does make numbering the pages more difficult.

Figure legends must be complete. The first sentence should serve as a short descriptive title. All symbols and abbreviations used in the related figure must be explained and you must explain what the figure is all about. Figure legends should be placed below the figure; however, care should be taken not to have too much drawing and legend text on a single page. Split the figure in multiple parts (and the legend, too, if necessary).

Any figures that are prepared by computer scanning or manipulation must be so identified in the figure legend. The software used and any manipulations performed must be clearly stated in the thesis - either in the legend or in the Materials and Methods section. Your supervisor must accept such figures as being true and accurate representations of the original data.

Tables do not have legends. The title of a Table should explain the data contained in a table. Specific information relating to particular data should be explained in footnotes to the table.

(C) Submission

Students will submit the dissertation to the Department Head before the end of the tenth week of the semester in which the student is registered for Biochemistry 499B. Students must submit their thesis as an electronic file. However, if an examiner requests a paper copy, you will be expected to provide one promptly. Electronic copies should be submitted in PDF format to the designated place (e.g. D2L Dropbox). If you are unsure where to send/submit your document, check with the course Coordinator first.

See Section F for information on submission of the corrected thesis (i.e. after the oral defense).

(D) Examination

Examination of the dissertation occurs in two steps.

First, the thesis is examined by a number of examiners. All theses will normally be read by an internal departmental examiner. The second examiner will normally be the Supervisor. The examiners will read the dissertation and award a grade based on that reading (see Section (G)). **The examiners must base this mark only on the amount of work that can be accomplished in two regular academic semesters.**

Students enrolled in Biochemistry 499B must present a brief talk on the work of the thesis. The talk should be 15 minutes in length. (Talks will not be permitted to exceed 20 mins.) The student should outline the work performed and present the key results. Appropriate slides with figures drawn

principally from the thesis should be used. The student will be expected to demonstrate a familiarity and understanding of the goals of the project, the techniques and methods used, and the significance of the results obtained.

At the conclusion of the presentation, the internal examiner, the Supervisor, an independent observer, and the Chair of the session, will each award a mark for the presentation. This mark shall be based only on understanding of the thesis, clarity of the presentation, and ability to answer questions.

(E) Correction

The copies of the thesis that were examined will be returned to the student for correction. The examiners may have marked their corrections on the examination copies of the thesis or may have prepared a written list of corrections. Some corrections may also be noted during the question and answer part of the presentation.

All corrections must be made both in letter and in spirit. In other words, it is not sufficient to correct just those specific details (such as typographical errors) that are noted. The student must pay attention to general comments and be able to demonstrate that they have been addressed. For example, if an examiner requests that the student check the Results section to remove undesirable jargon, the student must do this even though individual examples have not all been marked.

It sometimes happens that the two examiners may require conflicting corrections. If this happens, then the direction of the Supervisor takes precedence.

The Supervisor must sign a form indicating that all corrections have been made.

No mark will be submitted to the Registrar until the corrected thesis with accompanying forms has been submitted to the department.

Students are responsible for submission of corrected copies of the dissertation before the deadlines set by the University Registrar for receipt of course grades. Failure to submit a corrected thesis in a timely manner **will** delay submission of a grade for the course and, therefore, could delay graduation.

(F) Final Submission

The final version of the thesis must be printed on paper.

Two unbound copies of the corrected thesis must be submitted to the Department Head along with a signed library release form, and the form from the Supervisor indicating that corrections have been made. Each copy should be in a separate envelope and should NOT be bound or stapled. The two copies will go to the University Library and to the departmental library. The library release form is available in the Department Office.

It is customary to provide a copy of the thesis to your Supervisor. You should ask your Supervisor if they wish to receive one. Supervisors may be able to pay for this copy only from their grant.

Personal copies of the bound thesis are the student's own responsibility.

(G) Grades

Students enrolled in Biochemistry 499A will receive an interim grade from their Supervisor or Co-Supervisors based on their performance during their first semester of research and the quality of the

Introduction submitted. Individual Supervisors may require that students prepare a short report or give a brief presentation on work-to-date as part of the assessment for this grade.

Your final grade in Biochemistry 499B will be based on:

- (i) performance in the lab (30%)
- (ii) written thesis (30%) [See Biochemistry 499B Guidelines for details](#)
- (iii) dissertation (40%)

However, only if the corrections and revisions to the dissertation are satisfactory and if the oral presentation was satisfactory, will the grade for the course be approved by the Deputy Head (Undergraduate) for signature by the Head of the Department.

(H) List of Journals

I. Journals that require the full titles of referenced papers in the list of references.

American Journal of Clinical Nutrition	European Journal of Biochemistry
American Journal of Physiology	Genes and Development
Biochemical Journal	Journal of Bacteriology
Biochemistry and Cell Biology	Journal of Molecular Biology
British Journal of Nutrition	Journal of Nutrition
Cell	Molecular Microbiology

II. Journals that do not use titles of referenced papers in the list of references.

Biochemistry	Nucleic Acids Research
Biochimica et Biophysica Acta	Proceedings of the National Academy
EMBO Journal	of Sciences USA
Journal of Biological Chemistry	

THE TITLE OF THE STUDENT'S THESIS

by

Student's Name

A dissertation submitted in partial fulfillment of the requirements for the degree of
Bachelor of Science (Honours) in Biochemistry / Nutrition

Department of Biochemistry
Memorial University of Newfoundland

Month, Year Submitted

St. John's

Newfoundland

BIOC 499B GUIDELINES

Students, supervisors and readers please note!

In the past, there have been two main problems associated with the BIOC 499B examination. These are: (i) Students not handing in their thesis on time, and (ii) uneven grading of students. In an attempt to level the field for all students (to the extent possible), the changes listed below will be enforced. Please note that students, supervisors and potential readers are being informed of these changes TWO semesters in advance (i.e., at the start of 499A) so they have ample time to take the changes into account.

It must be emphasized that the honors thesis comprises lab work and thesis writing carried out over two semesters. If students have worked during the summer in a lab but registered for 499A / B in Fall and Winter, they should indicate in their thesis which results were obtained in summer.

1. Students should hand in (and supervisors should require) a complete first draft copy of their thesis to the supervisor at the beginning of March to ensure time for revisions.

Winter 2015 Deadline for First Draft to Supervisor: 2 MARCH 2015 at the latest

2. The deadline for submitting the Honors thesis is 11:59 pm on the Monday of the second last week of classes. This deadline will be **strictly** adhered to. Students submitting their thesis past the deadline will be **penalized 2%** per working day of delay.

Winter 2015 Deadline for Thesis Submission: 23 MARCH 2015

Only under exceptional circumstances will a student be granted an extension. Requests for extension should be made in writing by the student with reasons for requesting the extension clearly stated. Requests for extension will be examined on a case by case basis by the Head or his/her delegate. Later, if necessary, a supporting letter from the supervisor may be sought.

3. 499B oral defenses will be scheduled between the end of classes and up to a week after the end of the final exam period. Students and supervisors should keep in mind that they will need to be reasonably available during this time frame, to allow the defense to be scheduled for a time when the reader and observer are also available.

Winter 2015 Start of Oral Defenses: 6 APRIL 2015

4. Students should ensure well in advance that they provide to the faculty member in charge of 499B the title of their thesis and the supervisor's name. This will help in finding a suitable reader for the thesis.
5. The marking scheme will be:
 - 30% - lab performance (given by the supervisor)
 - 30% - written thesis (10% for supervisor, 20% for reader)
 - 40% - defense (10% each for supervisor, reader and two department representatives)

5. In order to make the marking as uniform as possible, the following marking scheme is proposed:

90 - 100%	<ul style="list-style-type: none"> - Exceptional performance in the lab together with substantial intellectual input - Extremely well-written thesis, appropriate language, clear figures, excellent discussion - Polished presentation, superior knowledge of the subject material and ability to answer questions - Overall well above average
80 - 89%	<ul style="list-style-type: none"> - Above-average performance in the lab together with some intellectual input - Well-written thesis, clear figures, good discussion - Good, clear presentation, good understanding of the subject material and ability to answer questions - Overall above average
70 - 79%	<ul style="list-style-type: none"> - Average performance in the laboratory. Little or no intellectual input into the project by the student - Several revisions were required to bring the standard of writing and quality of presentation up to expectations. Student showed slow progress in how to make corrections - Relatively poor presentation, student mostly read from slides, average understanding of subject material
60 - 69%	<ul style="list-style-type: none"> - Poor performance in the laboratory. Required direction in the laboratory at most times - Quality of written thesis below expectations; little effort expended in making corrections; poor presentation of figures and data - Poor presentation, poor ability to answer questions, poor understanding of subject material
<60%	<ul style="list-style-type: none"> - Very poor performance in the laboratory. Failed to complete experiments, careless use of facilities and equipment - Submitted thesis poorly written and presented, with little sign of revisions and corrections - Very poor presentation, brief, little data shown; poor handling of questions; failure to understand the subject material