

## PHYSL 469 - Undergraduate Research Thesis (2)

Students taking PHYSL 469 must have successfully completed PHYSL 468 in the Fall term (see form for PHYSL 468). Students taking PHYSL 469 are asked to:

- (i) have successfully completed PHYSL 210 or PHYSL212/214 and PHYSL468 (ii) review the following guidelines to understand expectations in this course.

### Objectives

The one term (6 credits) course PHYSL 469 is the second part of a 12 credit program in two terms, taken in conjunction with PHYSL 468. Students must have completed PHYSL 468 in the Fall term to be able to undertake PHYSL 469. Students will continue their research project initiated in the Fall term as PHYSL 468, and in the same research laboratory. Upon completion of their PHYSL 469 research, students will produce and defend an honours thesis that also includes results obtained during the first part of their project in PHYSL 468.

Students will have the opportunity to interact with a Physiology professor to be guided in the design, completion, and analysis of research experiments. Under the supervisor's guidance, students will also learn how to prepare and deliver an oral presentation and to present their research proposal both in writing and orally in front of the examining committee (supervisor, co-supervisor and course coordinators). In PHYSL 469, students will continue their research project and produce and defend an honours Thesis.

### Expectations

- *Expectations for lab work*

Students are expected to dedicate a **minimum of 16 hours per week** in the laboratory. Depending on the type of research and project, students should be prepared to spend more time in the laboratory.

Students will be expected to regularly keep a detailed and up-to-date notebook transcribing all the experimental details, challenges, results and conclusions.

**Students are expected to understand and be actively involved in a research project.** This includes, but is not limited to experimental design, data collection, data analysis, participation to lab meetings, and reading of the scientific literature related to their research project. Because of different laboratory organization, experimental approaches and work philosophy of each Professor, students are encouraged to discuss course and workload expectations with the potential supervisor before registering for the course.

- *Expectations for oral presentations*

Students will orally present their RESEARCH THESIS between **April 15 and 30**. The presentation will be 20 minutes maximum and should not include more than 25 slides. The oral presentation will be followed by a question period. **The selection of a fourth examiner (in addition to the supervisor and Drs. Pagliardini**

or Cordat), who will be an expert in the research field and who will also grade the written research proposal, is the responsibility of the supervisor. This examiner can either be internal or external to the department and must be chosen at the time of registration. **The student, supervisor and external examiner are required to attend both FALL (PHYSL468) and WINTER (PHYSL469) examinations.**

- *Expectations for written proposal*

Students are required to prepare and deliver a **20 page written original final thesis**, double spaced, not including figures, tables and references, presenting their research proposal. The report must be sent via email to the supervisor and other examiners **at least one week before** the oral examination, preferably as a PDF document. Marks for late papers will be reduced by 10 % per day. **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.**

This written thesis should be organized in Chapters as follows:

Thesis title page, abstract (maximum one page), acknowledgements, contents and abbreviations pages. These are not included in the 20 page limit.

Chapter 1: Introduction/background- This section should provide the necessary but not excessive and superfluous background information to allow the reader to understand the context of the research and the experimental question investigated. Relevant references should be included. This section should also include the research hypothesis.

Chapter 2: Methods- Materials and techniques used during the research project should be described with sufficient details to be reproducible. The origin of chemicals, antibodies and relevant materials should be provided. Statistical analysis used in the project should be reported.

Chapter 3: Results- Similar to a research publication, this section should describe research results based on the methods used, be logically organized, and explain the scientific reasoning and progression of the project.

Chapter 4: Discussion should provide an analysis of the results obtained during the research project and should be put in the context of the scientific research field. Limitations of the research or technical approach, and alternative methodologies should be highlighted.

References, figures and tables.

References, figures, tables and figure/table legends are not included in the 20 page limit. Figure and table legends should be comprehensible without reference to the text.

## Grading

Final grading will be organized as follows:

10% for satisfactory and regular upkeep of notebook. The notebook will be regularly examined by the supervisor and the final document will be handed to the examining committee for evaluation.

30% for the oral presentation, including 10% for the oral presentation and 20% for the question period. Time management, clarity of presentation and quality of answers to questions will be evaluated.

30% for student's performance in the laboratory. This includes taking ownership of the project, the student's performance at the bench, punctuality and behavior in the laboratory, quality of the results, and interaction with other laboratory members.

30% for the written research proposal. The proposal should follow the guidelines provided above.

Final grades will be assigned as follows:

**PHYSL 468 & 469 Grading Metric**

Outstanding	97-100%	4.0	<b>A+</b>
Excellent	91-96 %	4.0	<b>A</b>
Very Good	84-90 %	3.7	<b>A-</b>
	77-83 %	3.3	<b>B+</b>
Good	73-76 %	3.0	<b>B</b>
	70-72 %	2.7	<b>B-</b>
	64-69 %	2.3	<b>C+</b>
Satisfactory	61-63 %	2.0	<b>C</b>
	57-60 %	1.7	<b>C-</b>
Minimal Pass	54-57 %	1.0	<b>D</b>
Fail	1-53 %	0.0	<b>F</b>

**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 <http://www.governance.ualberta.ca/en/CodesofConductandResidenceCommunityStandards/CodeofStudentBehaviour.aspx>) and avoid any behaviour that could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence. Academic dishonesty is a serious offence and will result in failing of the course and suspension or expulsion from the University.

**COVID-19 regulations**

Students accepted in their research laboratory are required to follow the guidelines approved for their respective host laboratory. These guidelines may include wearing a mask and personal protective equipment

when coming to the laboratory. **Specific guidelines must be discussed with the supervisor prior to starting the course.** Failing to follow these rules may result in inability to complete the course.