

# PHYSL 461 - Undergraduate Research Project

Students taking PHYSL 461 are asked:

- (i) To have successfully completed PHYSL 210 or PHYSL212/214.
- (ii) To review the following guidelines to understand expectations in this course.
- (iii) To fill in the attached form with the proposed supervisor and hand it out to one of the course coordinators (Drs. Silvia Pagliardini or Emmanuelle Cordat) **before the end of September or January**. Course coordinator email addresses are: Drs. Silvia Pagliardini (silviap@ualberta.ca) and Emmanuelle Cordat (cordat@ualberta.ca).

## Objectives

PHYSL 461 is a one term (3 credits) course that will provide undergraduate students with basic training in a research laboratory. Students will have the opportunity to interact with a Physiology professor to be guided in the design of experiments and their completion, and will receive training in their analysis. Students will also learn how to prepare and deliver an oral presentation and defend their experimental findings both in writing and in front of peer scientists.

Work performed in a laboratory within the Department is strongly encouraged. Co-supervision with Professors from other departments is possible, provided that a supervisor from the Department of Physiology is identified. In this case, it is the responsibility of the student and the hosting Professor (from outside the department) to identify a Department member who will act as "Supervisor". The hosting professor will be listed as "Co-supervisor", even if the research project is conducted in his/her laboratory.

## Expectations

- *Expectations for lab work*

Students are expected to dedicate a minimum of 8 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 actively be involved in their research project. This includes reading the scientific literature related to their research project.

- *Expectations for oral presentations*

Students will orally present their experimental findings at the end of the term. Oral presentations are 20 minutes long 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 and Cordat), who will be an expert in the research field and who will also grade the written thesis, is the responsibility of the supervisor.** This examiner can either be internal or external to the department. Given the short amount of time spent in the laboratory, experimental results cannot necessarily be all positive and of publication quality, in which case, the student will discuss challenges encountered and troubleshooting attempted during the term.

- *Expectations for written report*

Students are required to prepare and deliver a **10 pages written report**, double spaced, not including figures and references, presenting their experimental results. The report **must be handed** to the supervisor and other examiners **at least one week before** the oral examination. 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 report should be organized as the following:

Introduction/background- This section should provide the necessary but not excessive or 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.

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

Results- Similar to a research publication, this section should describe research results obtained during the term, be logically organized, and explain the scientific reasoning and progression of the project. Negative results should also be included.

Discussion- Should provide an analysis of the results obtained during the research project and 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, tables and figure and table legends are not included in the 10 page limit. Figure and table legends should be comprehensible without reference to the text.

## Grading

Final grading will be 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 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 final written report. The report should follow the guidelines provided above, and provide a good discussion of the results obtained over the course period, even if results are negative.

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

# PHYSL 461 Registration

Student Name: \_\_\_\_\_

ID#: \_\_\_\_\_

Student Email address:

\_\_\_\_\_

Title of proposed research:

\_\_\_\_\_

\_\_\_\_\_

Name of Supervisor: \_\_\_\_\_

Name of additional examiner/co-supervisor: \_\_\_\_\_

Has the student discussed with the supervisor and agreed to the requirements of the course and proposed project?

What time is allocated in the student's timetable for undertaking the proposed project (Day of the week, hours per day)?

What arrangements are there for supervision of the student by the supervisor in person? If supervisor's lab members are involved in the day to day supervision, please indicate name and position.

Supervisor's signature \_\_\_\_\_ Date

Co-Supervisor's signature \_\_\_\_\_ Date

Student's signature \_\_\_\_\_ Date