

PHM389H1 RESEARCH PROJECT

DESCRIPTION

This elective course is designed to introduce students to the philosophy, methodology and performance of research in scientific fields offered by faculty members who hold graduate appointments in the Department of Pharmaceutical Sciences. The research will involve the review of pertinent scientific literature and the generation of new information. Depending upon the project and the supervisor, the research may be conducted in a number of settings, e.g., in a laboratory at the Faculty, in a hospital, community pharmacy, pharmaceutical company, or in an office. Fields of study are wide ranging and include drug delivery, drug metabolism, medicinal chemistry, pharmaceuticals, pharmacokinetics, pharmacoepidemiology, pharmacy administration and pharmacoconomics, radiopharmacy, receptor biology, therapeutics, and toxicology. The course includes working in the laboratory (or other relevant setting), reading, searching for literature, performance of research and writing of the research report. Often times, the research may result in a joint publication with the supervisor. Students are expected to spend a minimum of 78 hours on the course, and are required to obtain prior written consent of the supervisor and course coordinator.

APPLICATION AND ENROLMENT PROCEDURES

If the professor agrees to supervise your research project, the *Research Project - Supervisor Form* (which is part of this document), must be completed. One of the Course Coordinators for PHM389H1 must also sign this form.

The completed and signed *Research Project - Supervisor Form* must be returned to Linda Chung (in Room 424) by the appropriate deadline (see below). Submission of this form does not in itself complete your registration in the course. You must also complete a course add form with Linda by the appropriate deadline:

Fall Term: Wednesday, September 19, 2018

Winter Term: Friday, January 18, 2019

Course Coordinators: Professor K. Sandy Pang
E-mail: ks.pang@utoronto.ca
Telephone: 416-978-6164
Room: PB 1205

Professor Suzanne Cadarette
E-mail: s.cadarette@utoronto.ca
Telephone: 416-978-2993
Room: PB 602

RESPONSIBILITIES OF THE STUDENT

Selection of a Supervisor

Students may select a supervisor from among the faculty members of the Graduate Department of Pharmaceutical Sciences. A full list of faculty members from the Graduate Department of Pharmaceutical Sciences, along with information on their research areas, can be found on the Faculty's website at <http://www.pharmacy.utoronto.ca/gradprograms/graduate-faculty>. Students are encouraged to meet with several professors to discuss the project before making their final selection.

Course Requirements

Under the guidance of the supervisor, the student should:

- develop a clear understanding of the research problem through a thorough review of the literature,
- acquire the necessary skills to obtain and interpret data, and summarize the findings, and
- critically comment on study findings, limitations and how results fit within the context of existing literature.

Students are expected to devote no less than 78 hours to the project. This will involve, for example, working in the laboratory (or other relevant setting), searching and reading literature, and writing up the project. The actual time distribution will be flexible and determined by the nature of the research conditions and any timetable conflicts.

Academic credit will not be granted for prior research/work or if remuneration is received for such work. A review of the literature on a topic is not acceptable as a substitute for research.

The student will:

- i) **Submit a preliminary report/protocol** that outlines the background/rationale, the type of question(s) or hypotheses asked, methods and the significance of the project. The aim of this report is to aid the student in understanding the scope, nature and feasibility of the research project. The report should not exceed 3 double-spaced, typed pages (Times New Roman, 12-point font), exclusive of references, tables and figures (tables and figures may be appended to support the protocol report). References are imperative. Submit the report to Linda Chung in Room 424. The student will then have an **interview** with the Course Coordinators (lasting about 30 minutes) to discuss the suggested research topic. This interview will be held about 30 days after start of the term; the time will be set individually. The aim of this meeting is for the Course Coordinators to ensure that the student is familiar with what has been done via a background search, understands the project, stays focused, and proposes a project that is both feasible and manageable within the time frame.

The write-up and interview will comprise 10% of the final course grade.

- ii) Meet with his/her supervisor to discuss progress for the mid-term assessment. The discussion will be summarized using the "PHM389H1 Research Project Mid-term Evaluation Form". This form is submitted to Linda Chung in Room 424. The purpose of this assessment is to identify any deficiencies or problems at this mid-point and to determine if the project is progressing normally.

This mid-term assessment is for information only and is not graded.

iii) Prepare a final, double-spaced, type-written (Times New Roman, 12-point font) report of about 15 pages, excluding references, tables and figures. The report must follow the format of a scientific journal with sections on Introduction, Materials and Methods, Results, Discussion, Conclusion, Acknowledgement, Citations or References, Tables, Figures and Figure Legends. **The deadline to submit the final report is 5:00 p.m. on November 23, 2018 (fall term) or March 29, 2019 (winter term).** One copy of the report must be submitted to the supervisor. Hard and electronic copies of the report must be submitted to Linda Chung in Room 424. A copy of the report will be given by the Course Coordinators to a second reviewer. The second reviewer will remain anonymous but comments from him/her should be available.

The final report comprises 80% of the final course grade.

iv) Present his/her research in a 15-minute PowerPoint presentation (10-minute presentation + 5-minute Q&A) to faculty and students. This will be scheduled at the end of the fall or winter term.

The presentation comprises 10% of the final course grade.

GRADING AND SUPERVISION

Evaluation of student performance will be as follows:

1. Preliminary report (write-up and interview): 10%
2. Presentation: 10%
3. Thesis/Research paper: 80% (Supervisor, 54%; Secondary reviewer, 26%)

Final Grade: The student's final grade will be taken as sum of the grades

The supervisor's responsibilities include:

- a) to define the research problem; topic should be new and different from previously defined theses for this course so the student will have a fresh approach and new project
- b) to ensure, through guidance and encouragement, progress of the student and provide resources for conduct of the project
- c) to stimulate and evaluate the student in the laboratory (or other relevant setting) on his/her aptitude to think and learn
- d) to oversee the progress of the student and ensure a successful write-up of the project for submission of a grade
- e) to evaluate at mid-term the progress of the student, and to grade the final report

The Course Coordinators' responsibilities include:

- a) to oversee all project students; in case of conflict of interest by both Course Coordinators, the Chair of the Graduate Department will serve as the Course Coordinator
- b) to interview each student in defining the title and scope, and the strengths and weaknesses of the project at the time of submission of the first report and assign a grade for the interview
- c) to act as a back-up resource for consultation
- d) to identify a secondary reviewer to evaluate the final report
- e) to assign the final grade

Research paper assessment of marks:

Components	Grade Distribution	
	Supervisor	Second Reviewer
<i>SUPERVISOR ONLY</i> <ul style="list-style-type: none"> Assess student initiative, industriousness, problem-solving skills, responsiveness to suggestions, attention to details, comprehension, originality and creativity 	20	0
Background/Rationale (identification of problem) <ul style="list-style-type: none"> Assess thoroughness of literature search and rationale 	10	10
Methods (quality and depth of work) <ul style="list-style-type: none"> Assess whether student has adopted the most appropriate and relevant methodologies 	10	10
Results/data analysis <ul style="list-style-type: none"> Assess whether there are sufficient numbers/subjects or observations ($n > 3$); Statistical analyses 	10	10
Discussion <ul style="list-style-type: none"> Critical evaluation, interpretation 	10	10
Write-up <ul style="list-style-type: none"> Flow, style, grammar 	10	10
Total	70 x 54%	50 X 26%

Students who fail to submit the final report by the specified due date will receive a deduction of 5% for each day beyond the due date (including weekends/holidays).

PHM389H1 RESEARCH PROJECT – SUPERVISOR FORM

Submit to Linda Chung in Room 424 by September 19, 2018 (fall term) or by January 18, 2019 (winter term)

NOTES TO STUDENT:

This course requires the prior written consent of a member of the Graduate Department of Pharmaceutical Sciences.

Faculty approval and permission to enrol will not be granted unless this form contains the tentatively assigned title and the signature of the prospective supervisor. All parties agree to adhere to the Faculty guidelines for this course.

TO BE COMPLETED BY THE STUDENT:

Surname

Given Names (as on ACORN)

Student Number

Telephone Number

U of T E-mail Address

Proposed Research Topic

Date

Student's Signature

TO BE COMPLETED BY THE SUPERVISOR:

I consider this student acceptable to engage in a research project under my supervision.

Date

Supervisor's Name (Please print)

Supervisor's Signature

TO BE COMPLETED BY THE COURSE COORDINATOR:

I approve this student's enrolment in PHM389H1.

Date

Course Coordinator's Signature

**PHM389H1 RESEARCH PROJECT
GUIDELINES FOR PRELIMINARY REPORT/PROTOCOL AND INTERVIEW**

**Submit to Linda Chung in Room 424
by September 28, 2018 (fall term) or by January 25, 2019 (winter term)**

Name of Student: _____

Name of Supervisor: _____

Title of Project: _____

Items to be covered:

(1) Background/Rationale

Through reading of materials supplied by the supervisor and completing a literature search, the gaps in present knowledge should be apparent. How will the proposed study contribute to new knowledge and understanding of the problem?

(2) Objectives /Hypothesis

Clearly outline and identify hypotheses to be tested (should be supported by literature review/background). What are the aims and objectives?

(3) Proposed Methods

What are the models used and their rationale? What procedures are to be used in the collection of data, and are they state-of-the-art? What are the controls of the experiment, if any? Is the scope reasonable so that data can be generated within an appropriate time frame?

a) Measurement: What measurements are to be made, and would these pertain to the question?

b) Data Analysis: Is statistical analysis required? What is the number of experiments needed?

c) Timeline: Are the goals realistic?

(4) Ethics

Is animal experimentation under approval by University protocols? Is consent for working with human subjects/collaborators obtained according to University protocols? Has approval from the Faculty's Undergraduate Ethics Committee (or hospital site) been obtained, if necessary?

NB: projects that require ethics approval prior to data collection MUST have ethical approval PRIOR to course enrolment.

(5) What are the difficulties you foresee in the project?

Are there difficulties in mastering techniques or in data interpretation? Is there a problem with time-commitment in the laboratory? What support will the student have, e.g., graduate students have experience in techniques to be employed and will be available.

PHM389H1 RESEARCH PROJECT – MID-TERM EVALUATION FORM

**Submit this form to Linda Chung in Room 424
by October 19, 2018 (fall term) or by February 15, 2019 (winter term)**

To be completed by the student:

Name of Student: _____

Name of Supervisor: _____

Describe your accomplishments during the first half of the course. Are there any problems or difficulties you foresee in completing the project?

Date

Student's Signature

PHM389H1 MID-TERM EVALUATION FORM

**Please submit this form to Linda Chung in Room 424
no later than October 19, 2018 (fall term) or February 15, 2019 (winter term)**

To be completed by the supervisor:

Name of Student: _____

Name of Supervisor: _____

Comment on the general performance of the student and his/her work completed thus far. Comment on any existing or potential problems for the student in the second half of the course.

Date

Supervisor's Signature

PHM389H1 RESEARCH PROJECT

Deadline Dates for 2018-19

	2018 Fall Term	2019 Winter Term
Course orientation	To be scheduled the week of September 3, 2018	To be scheduled the week of January 7, 2019
Safety course	Early September 2018	Early January 2019
Submit Research Project – Supervisor Form AND Course Add Form*	September 19, 2018	January 18, 2019
Submit short write-up of proposed project (for the Course Coordinator)*	September 28, 2018	January 25, 2019
Complete interview with the Course Coordinator#	To be scheduled the week of October 1, 2018	To be scheduled the week of January 28, 2019
Submit Mid-term Evaluation Form (briefly describing progress and difficulties)	October 19, 2018	February 15, 2019
Submit final report to Supervisor Submit final report for the Course Coordinators** LATE PENALTY: a deduction of 5% for each day beyond the due date (including weekends/ holidays)	November 23, 2018 by 5:00 p.m.	March 29, 2019 by 5:00 p.m.
15 minute PowerPoint presentation of work (10 minute presentation + 5 minute Q&A)	To be scheduled the week of November 26, 2018	To be scheduled the week of April 1, 2019

* Submit a hard copy of the document to Linda Chung in Room 424.

** Submit a hard copy and an electronic copy of the final report to Linda Chung in Room 424.

Student will be contacted by e-mail for an interview with the Course Coordinators.