



PHC 489Y1: Research Project Course

I. TEACHING TEAM

INSTRUCTORS:

<p>Dr. Tameshwar Ganesh Course Coordinator tameshwar.ganesh@mail.utoronto.ca Tel: 416 706 7615</p> 	<p>Dr. David Dubins Course Coordinator d.dubins@utoronto.ca Tel: 416-946-5303 Office: PB802</p> 
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STUDENT HOURS:

Total number of research project hours : 165

Specific workshop and oral presentation dates described in PHC489Y1 Deadline Dates 2023-24.

II. COURSE OVERVIEW

COURSE DESCRIPTION:

Welcome to PHC489! This research project course is designed to introduce to 4th year BSc Pharmaceutical Chemistry specialist students the philosophy, methodology and performance of research in scientific fields offered by faculty members who hold graduate appointments in the Dept of Pharmaceutical Sciences, Leslie Dan Faculty of Pharmacy. A list of these could be found in <https://www.pharmacy.utoronto.ca/faculty>. You may also select a supervisor who holds a graduate appointment at any science-related Faculty (with approval from the course coordinator), providing the research is related to the health sciences. The research will involve the review of pertinent scientific literature and the generation of new scientific information. Depending upon the project and the supervisor, the research may be conducted in a number of settings, e.g., laboratory at the Faculty, in a hospital, community pharmacy, pharmaceutical company, or in an office. Fields of study are wide ranging, e.g., drug delivery, drug metabolism, medicinal chemistry, pharmaceuticals, pharmacokinetics/dynamics, pharmacoepidemiology, pharmacy administration and pharmacoconomics, radiopharmacy, receptor biology, therapeutics, and toxicology. Students are expected to spend a minimum of 165 hours on the course. Fields of study available are shown on the Pharmacy website, where one finds a list of graduate faculty professors and description of research areas. Often times, the research may result in joint publication with supervisor. The course includes working in the laboratory/office, reading, searching for literature, performance of research and writing

of the research report. Students are required to obtain prior written consent of the supervisor and Course Coordinator.

STUDENT LEARNING OUTCOMES:

By the end of PHC489Y1, students will ...

- 1) Gain knowledge through hypothesis-driven methods of inquiry aimed at answering scientific questions through the design and implementation of experimental and theoretical methods. (Dept. of Chemistry Undergraduate Learning Outcomes, June 2021)
- 2) Apply quantitative and qualitative methods for the analysis, evaluation, and interpretation of scientific data. (Dept. of Chemistry Undergraduate Learning Outcomes, June 2021)
- 3) Access, select and critically evaluate scientific information and literature in order to solve a wide range of problems both within and outside of chemistry (Dept. of Chemistry Undergraduate Learning Outcomes, June 2021)
- 4) Take into account limitations, assumptions, and uncertainties when making decisions or solving scientific problems, and justify the approach(es) taken. (Dept. of Chemistry Undergraduate Learning Outcomes, June 2021)
- 5) Communicate scientific knowledge to diverse audiences clearly and concisely in written, oral, and visual forms. (Dept. of Chemistry Undergraduate Learning Outcomes, June 2021)
- 6) Work independently and collaboratively while exercising initiative, responsibility, and accountability in both personal and group contexts. (Dept. of Chemistry Undergraduate Learning Outcomes, June 2021)
- 7) Understand, practice and promote safe behaviour in a laboratory environment, including responsible management of chemical resources. (Dept. of Chemistry Undergraduate Learning Outcomes, June 2021)
- 8) Reflect upon the dynamic nature of chemistry and value opportunities for updating their knowledge, understanding, and technical and professional skills as practitioners of the discipline on a continuing basis. (Dept. of Chemistry Undergraduate Learning Outcomes, June 2021)
- 9) Write and assemble a formal thesis report for their scientific project, and understand how that differs from writing a formal laboratory report.

PREREQUISITE COURSE(S):

Permission from the Course Coordinator and enrolled as a Year 4 student in the Pharmaceutical Chemistry specialist program.

READINGS:***Required Text***

None.

Recommended Texts

None.

Course Resources

Course notes, objectives, and information will be made available through the University of Toronto [Quercus](#) system.

III. COURSE ORGANIZATION**COURSE SCHEDULE, LOCATION, AND RELEVANT SESSIONAL DATES:****PHC489Y1 Deadline Dates 2023-2024**

Summer Registration 2023	(Dates to be confirmed by Course Coordinator)
Safety Course: TBD	Week of September 7 th , prior to start of classes (TBD)
Submit Research Project – Supervisor Form	18-Sep-23, by 5p, submitted electronically on Quercus (3rd Monday in September)
Last day to add Y section course	20-Sep-23
Short write-up of proposed project to Coordinator	29-Sep-23 by 5 pm, submitted electronically on Quercus (last school day in September)
Complete interview with Coordinator	Last week in October / First week in November; Student to arrange time with Course Coordinator (Sign-up list will be posted on Quercus).
Mid-term evaluation, co-signed by student and supervisor*	06-Dec-23 by 5p (last day of Fall Term)
Last day to drop Y section course	19-Feb-24
Communicating in Science – How to Write a Thesis Workshop	19-Mar-24, 3-5p in PB800
Rough copy to Supervisor or Supervising Graduate Student for Comment	25-Mar-24
Communicating in Science – Oral Presentation Workshop	26-Mar-24, 3-5p in PB800
Thesis deadline, 2 copies, one to supervisor (via email), one to coordinator (on Quercus)	01-Apr-24 by 5p
PowerPoint presentation of project	8-Apr-24, 11a-2p in PB850 (last day of Winter Term)

For important academic sessional dates, visit:

<https://www.artsci.utoronto.ca/current/dates-deadlines/academic-dates>

APPLICATION AND ENROLMENT PROCEDURES

This course is offered in the fall/winter and summer terms to Pharmaceutical Chemistry students who have successfully passed their 3rd year or who are commencing their 4th year. The proposed work for

PHC489Y1 must be novel and distinct from those generated in other programs (summer student research or any paid activity) and completed within the stipulated time.

Prior to enrolment, PHC students may interview with potential supervisors (pharmaceutical sciences or external graduate faculty) who will provide the time and resources for completion of the research project. Successful enrolment into the course requires the written consent of the professor who will supervise the student's research. Students are responsible for completing and returning the signed *Research Project/Supervisor Form* to the PHC489Y1 Course Coordinator by email by the appropriate deadline (please refer the PHC489Y1 timetable – end of document) to complete registration of the course. Students may also consult with the PHC489Y1 Course Coordinator for advice on the choice of supervisor. Students may investigate the nature of research topics of the potential supervisors through the internet. It must be noted that the number of available research positions in each laboratory is limited. Students should complete arrangements before the end of the Faculty registration deadline.

COMMUNICATING IN SCIENCE WORKSHOPS

There will be two x 2h workshops provided for PHC489Y1 students, including:

- Thesis Writing Workshop (March 19th, 3-5p)
- Oral Presentation Workshop (March 26th, 3-5p)

These workshops have been specifically designed to help improve your science communication skills. Please take advantage of them by attending and participating! They will improve your performance in PHC489Y.

RESPONSIBILITIES OF STUDENT

Selection of Supervisor

Students may select a supervisor from among members of the Graduate Department of Pharmaceutical Sciences (science stream or social administration stream). Students may investigate the nature of research of potential supervisors through the Internet (e.g. Pubmed or Google Scholar). Students are encouraged to meet with several professors to discuss the project before making their final selection. Under the guidance of the supervisor, the student should:

- develop a clear and comprehensive 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.

The student is expected to devote no less than **165 hours** to the project. This will involve working in the laboratory (or other relevant setting), reading, or searching literature in the library, performing surveys or analyzing data, 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. Students taking PHC489Y1 as their elective requirement should initiate their research during the spring session in their 3rd year if taking the course in the summer, and work during the summer months to complete the project by the end of the fall term. If a student takes PHC489Y1 during the fall/winter academic session, the student should initiate their research in the fall session leading into their 4th year and must complete the project by the end of the spring term. **A review of the literature only or a review cannot be used as a substitute for the proposed research in this course.**

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 (see "GUIDELINES FOR THE PRELIMINARY REPORT (AND INTERVIEW) FOR PHC489Y1 RESEARCH PROJECT",

below). The aim of this report is to aid the student in understanding the scope, nature and feasibility of the research project. The student will then have an interview with the Course Coordinator (lasting about 15 minutes) to discuss the suggested research topic (arrangement made about a month after start of semester; time will be set individually). The aim of this meeting is for the Course Coordinator to ensure that the student is familiar with what has been done via 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) For the mid-term assessment, the student and the supervisor will meet to discuss progress, and the discussion will be summarized using the “PHC489H1 Mid-term Evaluation Form”. The forms are then submitted electronically (via email) to the Course Coordinators. The purpose is to identify any deficiencies or problems at this mid-point and determine if the project is progressing normally.

The assessment is not graded. It is performed for information purposes only.

- iii) **Final Thesis.** Prepare a final, 1.5-spaced, type-written report (Times New Roman, 12-point font) of 15 pages or less, excluding title page, tables, figures, and references. **A penalty** will be given for excess pages and lack of conformity to specifications of the report.

The report must follow the format of a scientific journal that includes an Abstract, not exceeding 250 words, and Sections on Introduction, Materials and Methods, Results, Discussion, and Conclusion. The sections (excluding abstract) must not exceed 5000 words. Acknowledgement, Citations or References, Tables and Figures (less than 10), and Figure Legends. If collaborators (e.g. immediate supervisor or other students) are included, the roles of each must be defined. The student must submit two paper copies of the report – one to the supervisor, and one to the PHC489 Course Coordinator no later than 5:00 p.m. on the specified day (see course timelines). The reader will remain anonymous, but comments should be made available.

The final report comprises 70% of the final grade (marks from the supervisor and reader).

- 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 course, and may occur on an online platform (e.g. Zoom meetings). **The presentation will be graded by attending faculty members and will comprise 20% of the final grade.**

RESPONSIBILITIES OF THE SUPERVISOR

Supervisor responsibilities include:

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

Course Coordinators responsibilities include:

- 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;
- to interview each student in defining the title and scope, and strengths and weaknesses of the project at the time of submission of the first report and assign a grade for the interview;
- to act as a back-up resource for consultation;
- to identify a secondary reviewer that will evaluate the report and assign the final grade.

IV. EVALUATION/GRADING SCHEME

OVERVIEW:

The final grade will be based on a preliminary report, an oral presentation, and a final thesis/research paper.

ASSESSMENT DATES & MARK BREAKDOWN:

All marks will be provided on Quercus. The schedule and weighting of the evaluative components of the course are as follows:

1) Preliminary Report (3 pages) & Interview (15 minutes)

Weight: 10%

Dates: Preliminary Report: September 29th by 5p, electronically

Interview: Approx. 30 days after start of semester; time will be set individually

2) Midterm Assessment

Weight: None (Formative Assessment)

Dates: December 6th by 5p, electronically

3) Oral Presentation (10 + 5 minutes)

Weight: 20%

Dates: April 8th from 11a-2p

4) Thesis/Research paper

Weight: 70% (Supervisor, 54%; Secondary reviewer, 26%)

Dates:

Rough copy to supervisor for review: 25-Mar-24

Final Thesis Due: April 1st by 5p, electronically

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

V. COURSE POLICIES

- Each member of this course is expected to maintain a:
 - (i) professional and respectful attitude during all course activities, including classes, laboratories, and online activity.
 - (ii) personal calendar/schedule/organizer to ensure that all course activities are completed, and due dates are met.
 - (iii) collection of notes recorded independently based on concepts covered in course activities (students registered with Accessibility Services requiring a class note-taker will have access to this accommodation)
 - (iv) familiarity with the university policy on Academic Integrity:
<https://www.artsci.utoronto.ca/current/academic-advising-and-support/student-academic-integrity>

Lateness Policy

Deadline dates for enrolment and drop dates must be strictly adhered to. For late submission of the preliminary report or final thesis, there will be an academic penalty imposed of 3% per calendar day, to a maximum of 1 week.

E-mail

- For course concerns or issues with non-academic problems, such as conflicts, illness and academic accommodations, please email the course coordinator.
- When you e-mail an individual, the language and tone of your email professional. Email only one member of the teaching team. Most emails will receive a reply within 24 hours of being sent (except on weekends) but keep your expectations reasonable as to the degree of detail that an email reply to your enquiry can realistically provide.

Course Environment

- The University of Toronto is committed to equity, human rights and respect for diversity. All members of the learning environment in this course should strive to create an atmosphere of mutual respect where all members of our community can express themselves, engage with each other, and respect one another's differences. As a Course Instructor, I will neither condone nor tolerate behaviour that undermines the dignity or self-esteem of any individual in this course and wish to be alerted to any attempt to create an intimidating or hostile environment. It is our collective responsibility to create a space that is inclusive and welcomes discussion. Discrimination, harassment and hate speech will not be tolerated. If you have any questions, comments, or concerns, we encourage you to reach out to the staff in our Equity Offices.

Privacy Policy

- Elements of this course, including your participation, may be recorded on video and will be available to students in the course for viewing remotely and after each session.
- Course videos and materials belong to your instructor, the University, and/or other sources depending on the specific facts of each situation, and are protected by copyright. Do not download, copy, or share any course or student materials or videos without the explicit permission of the instructor.
- For questions about recording and use of videos in which you appear please contact your instructor.
- At times, you may be required to share your desktop, and/or turn on your webcam to confirm participation in course activities, and/or to troubleshoot practical activities.

Absences

Students who are absent from in-person elements of this course for any reason (e.g., COVID, other illness or injury, family situation) and who require consideration for missed academic work should report their absence through the online absence declaration. The declaration is available on ACORN under the Profile and Settings menu. You must also advise Dr. Dubins, the Course Coordinator, of your illness in order to receive consideration.

VI. TECHNOLOGY REQUIREMENTS

REQUIRED EQUIPMENT

- **A laptop or desktop computer** will be required for this course.
 - **Microsoft PowerPoint** is required for this course.
- Specific guidance from the U of T Vice-Provost, Students regarding student technology requirements is available here: <https://www.vicereprovoststudents.utoronto.ca/covid-19/tech-requirements-online-learning/>
 - Advice for students more broadly regarding online learning is available here: <https://onlinelearning.utoronto.ca/getting-ready-for-online>.

- This course requires the use of computers, and technical issues are possible. When working on a piece of academic work, students are responsible for scheduling enough time to allow for reasonable delays due to technical difficulties to be overcome, so such issues will not be acceptable grounds for deadline extension. Particularly, maintaining an up-to-date independent backup copy of your work is strongly recommended to guard against hard-drive failures, corrupted files, lost computers, etc.

We appreciate that students may experience a range of circumstances that shape their ability and/or decision to participate in course activities using video. We are committed to creating equitable and inclusive learning and teaching spaces. In support of this commitment we feel it is important to give participants the choice to turn their video on/off.

For General technology concerns, please contact the Information Commons Help Desk via (416) 978-HELP (4357) OR by e-mailing help.desk@utoronto.ca. They are open evenings and weekends.
<https://oneresearch.library.utoronto.ca/ic-faq-categories/about-and-hours-service>

Please contact the course co-ordinator with course-specific technology concerns. Please be as detailed as possible with your question by including the time/date, detailed description of the problem, web browser and device you were using (e.g. laptop/tablet etc.) and include screenshots/error message etc.

VII. INSTITUTIONAL POLICIES AND SUPPORT

ACADEMIC INTEGRITY

Academic integrity is essential to the pursuit of learning and scholarship in a university, and to ensuring that a degree from the University of Toronto is a strong signal of each student's individual academic achievement. As a result, the University treats cases of cheating and plagiarism very seriously. The University of Toronto's Code of Behaviour on Academic Matters (governingcouncil.utoronto.ca/secretariat/policies/code-behaviour-academic-matters-july-1-2019) outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences. Potential offences include, but are not limited to:

In practical work:

1. Using someone else's ideas or words without appropriate acknowledgement.
2. Submitting your own work in more than one course without the permission of the instructor.
3. Making up sources or facts.
4. Obtaining or providing unauthorized assistance on any assignment. **Please note that the use of websites (such as Chegg.com or the course discussion board) to post virtual laboratory report material/questions or to post/access answers to questions is an academic offence under the University of Toronto's Code of Behaviour on Academic Matters. Alleged instances of this nature are forwarded to the Faculty of Arts & Science Student Academic Integrity office.**

On tests:

1. Using or possessing unauthorized aids. **Please note that the use of websites (such as Chegg.com or the course discussion board) to post quiz/term test questions or to post/access answers to questions is an academic offence under the University of Toronto's Code of Behaviour on Academic Matters. Alleged instances of this nature are forwarded to the Faculty of Arts & Science Student Academic Integrity office.**
2. Looking at someone else's answers or collaborating or discussing answers during an exam or a test.
3. Misrepresenting your identity.

In general academic work:

1. Falsifying institutional documents or grades.
2. Falsifying or altering any documentation required by the University.
3. Sharing solutions to the online homework

Course Policy on Use of Artificial Intelligence Tools (e.g. ChatGPT):

The goal of technical writing is to report clearly (easily understood), accountably (accurate and honest reporting), and transparently (not trying to hide or obscure data or procedural errors). Artificial intelligence tools can assist in this regard, provided the tools are used in ethical ways:

- Students **may** use generative AI tools to improve the quality and clarity of their written work (e.g. to assist in writing proposal and final thesis).
- Students **may** use AI to increase their comprehension of the area of interest, however all concepts generated from AI must be carefully cited and vetted if used in any assignments.
- Any *specific* content produced by an artificial intelligence tool **must be cited appropriately**. Many organizations that publish standard citation formats are now providing information on citing generative AI (e.g., MLA: <https://style.mla.org/citing-generative-ai/>).

e.g.: “Using clear scientific language, describe the importance of surfactants in liquid drug formulations. Add specific real-world examples, elaborate on mechanisms, and discuss current challenges.” prompt. ChatGPT-3.5, OpenAI, 7 Sep. 2023, <https://chat.openai.com>.

- Students **may not** use artificial intelligence tools to generate experimental data or results that were intended to be collected in the laboratory.
- **Students are ultimately accountable for the work they submit.**
- If you have any questions about the use of AI applications for course work, please speak with the instructor.

All suspected cases of academic dishonesty will be investigated following procedures outlined in the Code of Behaviour on Academic Matters. If you have questions or concerns about what constitutes appropriate academic behaviour or appropriate research and citation methods, you are expected to seek out additional information on academic integrity from your instructor or from other institutional resources (see www.academicintegrity.utoronto.ca/).

PLAGIARISM DETECTION

Normally, students will be required to submit their course essays to the University’s plagiarism detection tool for a review of textual similarity and detection of possible plagiarism. In doing so, students will allow their essays to be included as source documents in the tool’s reference database, where they will be used solely for the purpose of detecting plagiarism. The terms that apply to the University’s use of this tool are described on the Centre for Teaching Support & Innovation web site (<https://uoft.me/pdt-faq>).

COPYRIGHT

If a student wishes to copy or reproduce class presentations, course notes or other similar materials provided by instructors, he or she must obtain the instructor's written consent beforehand. Otherwise, all such reproduction is an infringement of copyright and is absolutely prohibited. See the **Privacy Policy** section in this document for more details. More information regarding this is available here: <https://teaching.utoronto.ca/ed-tech/audio-video/copyright-considerations/>

ACCESSIBILITY NEEDS

Students with diverse learning styles and needs are welcome in this course. The University of Toronto is committed to accessibility: if you require accommodations for a disability, or have any other accessibility concerns about the course, please contact [Accessibility Services](#) as soon as possible.

ACCOMMODATIONS FOR RELIGIOUS OBSERVANCES

Following the University's policies, reasonable accommodations will be made for students who observe religious holy days that coincide with the due date/time of an assignment, tutorial, class or laboratory session. Students must inform the instructor **before** the session/assignment date to arrange accommodations.

ADDITIONAL SERVICES & SUPPORT

The following are some important links to help you with academic and/or technical service and support:

- General student services and resources at [Student Life](#)
- Full library service through [University of Toronto Libraries](#)
- Resources on conducting online research through [University Libraries Research](#)
- Resources on academic support from the [Academic Success Centre](#)
- Learner support at the [Writing Centre](#)
- Information for [Technical Support/Quercus Support](#)

ACKNOWLEDGEMENT OF TRADITIONAL LANDS

We wish to acknowledge this land on which the University of Toronto operates. For thousands of years, it has been the traditional land of the Huron-Wendat, the Seneca and, most recently, the Mississaugas of the Credit River. Today, this meeting place is still the home to many Indigenous people from across Turtle Island and we are grateful to have the opportunity to work on this land.

VIII. COURSE FORMS

Research Paper – recommended assessment for marks

Components	Supervisor, 66.7% of final thesis mark	Second Reviewer, 33.3% of final thesis mark
SUPERVISOR ONLY Assess student initiatives, industriousness, problem-solving skills, responsiveness to suggestions, attention to details, comprehension, originality and creativity	20	0
Background/Rationale (identification of problem) Assess thoroughness of literature search and rationale	10	10
Methods (quality and depth of work) Assess whether student has adopted the most appropriate and relevant methodologies	10	10
Results / data analysis Assess whether there are sufficient numbers/subjects or observations (n > 3); Statistical analyses	10	10
Discussion Critical evaluation, interpretation	10	10
Write-up Flow, style, grammar	10	10
Total	70	50

Students who fail to submit the final report by the specified due date will receive a deduction of 3% of the total marks for the thesis, for each day beyond the due date (including weekends/holidays)

PHC489Y1 RESEARCH PROJECT/SUPERVISOR FORM
(submit to PHC489 Course Coordinator by email)

NOTES TO STUDENT:

This course requires the prior written consent of a member of the Graduate Department of Pharmaceutical Sciences or external graduate faculty member of a health or science-related discipline, with approval from the course coordinator.

It is the student's responsibility to contact and search for a suitable supervisor for the research project and return the signed and completed form to the PHC489 Course Coordinator, **on September 18, 2023 by 5p.**

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

TO BE COMPLETED BY THE STUDENT:

Surname Given Name(s) (as on ACORN)

Student Number Telephone Number

E-mail Address

Desired Research Topic

Date Name 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 PHC489Y1.

Date Name Course Coordinator's Signature

GUIDELINES FOR THE PRELIMINARY REPORT (AND INTERVIEW) FOR PHC489Y1 RESEARCH PROJECT (to be submitted to the PHC489 Course Coordinator, by deadline)

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 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 ethics 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

Technical Requirements:

This is a technical report that should adhere to scientific writing principles followed in other Pharmaceutical Chemistry courses (e.g. PHC340 Pharmaceutical Laboratory).

The report should have your name, the course code, a unique descriptive project title, and the date.

The report should not exceed **THREE double-spaced**, typed (**Times New Roman, 12-point font**) pages, exclusive of references, tables and figures (tables and figures may be appended to support the protocol report).

Academic Honesty, Proper Referencing, and Plagiarism:

Including a sufficient number of references to help frame your project in the literature is essential – not just by listing them at the end, but by referring to them in-line *throughout the text*.

You will be submitting your preliminary and final reports electronically through Quercus. **Original** will be used to verify that your paper writing is your own. Please ensure that you practice proper referencing throughout your work.

Here are some suggestions:

- 1) Make sure all the references you used are properly included in your **Reference** section.
- 2) Use local references in the body of your text.

If you decide to copy and paste a sentence from a source, make sure to put it in quotes, and follow it *immediately* with a local reference. By omitting local references, the reader is unclear which ideas are your own, and which came from your sources. For example:

"If you are going to use direct quotes from an article, the safest and most accepted way of doing this is by putting the text in direct quotes, like this, and then referencing the author after." (Dubins, 2022)

"If there is a large string of text that you would like to include in the body of your work, the proper way of doing this is by separating it from your writing in its own paragraph (indented), making it clear to the reader that the entire block of text comes from a different source, and that you did not write it." (Dubins, 2022)

If you use someone else's ideas and re-word them, you still need to follow that idea *immediately* with a local reference, not just list the reference in your Reference List. (Dubins, 2022)

- 3) If you copy a figure or image from a paper or source, it also needs to be properly referenced in the figure legend, and in your Reference List.

For more help on how not to plagiarize, please see this link:

<https://advice.writing.utoronto.ca/using-sources/how-not-to-plagiarize/>

References:

Dubins, D., "PHC489Y1 Course Syllabus – 2022-23 (Fall/Winter)". *PHC 489Y1: Pharmaceutical Chemistry Research Project, LDFP UofT (Sep 2022)*;1-15.

PHC489Y1 MIDTERM EVALUATION FORM

Please submit this form by email to the PHC489 Course Coordinator by **December 6th 2023, by 5p.**

To be completed by 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 Signature

PHC489Y1 MIDTERM EVALUATION FORM

Please submit this form to the PHC489 Course Coordinator by **December 6th 2023, by 5pm.**

To be completed by Supervisor:

Name of Student: _____

Name of Supervisor: _____

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

Date

Supervisor Signature