

We recognize and acknowledge that McMaster University meets and learns on the traditional territories of the Mississauga and Haudenosaunee nations, and within the lands protected by the "[Dish With One Spoon](#)" wampum, an agreement amongst all allied Nations to peaceably share and care for the resources around the Great Lakes.

BIOCHEM 4F09, 4T15 & BIOMEDDC 4A15 Senior Research Thesis 2024-2025 FALL & WINTER Terms

Instructors: Dr. Caitlin Mullarkey | **E-mail:** mullarkc@mcmaster.ca | **Office:** HSC 4H66

There will be no set office hours. You can email to schedule a meeting in advance if you need to see us outside of the scheduled class times.

FOR THIS COURSE WE WILL USE THE GENERIC BCTHESIS@MCMASTER.CA E-MAIL FOR ALL THESIS COMMUNICATION.

Fall 2023 and Winter 2024

Section	C0 1
Instructor	Dr. Mullarkey
Contact Info	See above
Office Hours	See above
Class Schedule	Thurs
Time	10:30-11:20 AM
Location	Virtual (Zoom) unless specified on A2L

Course Description

This course is an intensive two-term research project carried out under the supervision of a McMaster research investigator in the general area of the biochemistry and biomedical sciences. A fourth-year capstone course, the thesis is a self-directed learning experience in a cutting edge, research environment for biomedical research. Students will take initiative to practice effective time management, communication and professionalism in order to be successful. Students will plan and execute this learning experience with inputs from both the scientific literature and their research environment and will

communicate their findings in both written and oral form. Their lab supervisor(s) and co-workers will be very important resources. There will also be occasional tutorials with the course coordinators.

Prerequisite(s): Registration in an Honours Biochemistry or Biomedical Discovery and Commercialization program. Permission of the Department is required.

Antirequisite(s): BIOCHEM 4B06 A/B , 4C03, 4F09 A/B, 4R12 A/B, 4Z03, ISCI 4A12 A/B

HTHSCI 4B06 A/B S, 4A09 A/B S, 4A12 A/B S, 4A15 A/B S, 4C06 A/B, 4C09 A/B, 4C12 A/B, 4C15 A/B, 4D09 A/B, 4D12 A/B, 4G09 A/B S, 4G12 A/B, 4G15 A/B S, 4R09 A/B, 4R12 A/B S, 4D06 A/B, 4G06 A/B S

Not open to students enrolled in the Bachelor of Health Sciences Program.

Not open to students with credit or registration in any Level IV department- or program-based thesis or independent study/project course.

May not be taken concurrently with any research project (BIOCHEM 3R06 A/B), thesis, or experiential education course under the supervision of the same supervisor.

Course and Learning Objectives

Learning Objectives

Upon completion of this course, the student will be able to:

1. Critically analyze, assess, and appraise primary literature in a field relevant to the scope of the approved project
2. Plan and execute experiments (wet or dry lab) relevant to the scope of the approved project
3. Gather, organize, and clearly communicate their findings to an audience of peers and faculty

Class Activities:

The intent of this course is to provide an immersive research experience and therefore, class times will only be used on an *ad hoc* basis. We will NOT meet every week. Our expectation is that you will be working on your project during these dedicated times. **The extent to which your research project will take place in-person (in the lab) or virtually (data analysis, computational, bioinformatics etc.) will be dictated by your supervisor.** If changes to your proposed research are necessary, these will be assessed on a case-by-case basis by the course coordinators. Announcements will be posted on A2L when class sessions are planned, and either a room or Zoom link will be provided.

Materials & Fees

Required Materials/ Resources

None

Virtual Course Delivery

To follow and participate in virtual classes it is expected that you have reliable access to the following:

- A computer that meets performance requirements [found here](#).
- An internet connection that is fast enough to stream video.
- Computer accessories that enable class participation, such as a microphone, speakers and webcam when needed.

If you think that you will not be able to meet these requirements, please contact uts@mcmaster.ca as soon as you can. Please visit the [Technology Resources for Students page](#) for detailed requirements. If you use assistive technology or believe that our platforms might be a barrier to participating, please contact [Student Accessibility Services, sas@mcmaster.ca](#), for support.

Course Overview and Assessment

Literature review article: Students will complete a literature review that demonstrates analysis and integration of the current literature and if applicable unpublished findings. The literature review should address an important and relevant aspect of the research area in their assigned laboratory. **The topic of the literature will be set by the principal investigator of the lab.** Laboratory supervisors will help guide and mentor students through the drafting and completion of this assignment. Maximum 10-pages, double-spaced, Times New Roman 12-point font, 2 cm margins. Figures, tables, and references do not count in the page limit and can be added at the end of the document.

Literature review checkpoint assignments: These assignments have been designed to help ensure students make steady progress and receive timely feedback from their lab mentors. They will include: topic submission, outline and reference list, and a review of mentor feedback. Please see the Assessment Guidelines document for more information.

Lab Performance and progress: Lab performance (wet or dry) will be assessed three times throughout the course by the lab supervisor(s) and will include a discussion of this assessment.

Final Written Thesis: Students will prepare a written thesis document that makes clear the relevant background, the problem that they are trying to solve, the progress made and analysis of results in the context of the research field. Maximum 20-pages, double-spaced, Times New Roman 12-point font, 2 cm margins. Figures, tables, and references do not count in the page limit and can be added at the end of the document.

Final Thesis Presentation: Students will deliver a 15-minute PowerPoint presentation summarizing their research efforts in the context of the field followed by a 5-minute question period.

Evaluation

Assessment Method	Weight
Literature Review Checkpoint Assignments	5% (total)
Checkpoint Assignment 1 = 1%	
Checkpoint Assignment 2 = 2%	
Checkpoint Assignment 3 = 2%	
Literature Review Article	15%
Lab Performance and Progress	40% (total)
Lab Mentor Evaluation 1 = 10%	
Lab Mentor Evaluation 2 = 15%	
Lab Mentor Evaluation 3 = 15%	
Final Written Thesis	20%
Final Thesis Presentation	20%
Total	100%

Requests for Relief for Missed Academic Term Work

[McMaster Student Absence Form \(MSAF\)](#): In the event of an absence for medical or other reasons, students should review and follow the Academic Regulation in the Undergraduate Calendar “Requests for Relief for Missed Academic Term Work”.

MSAF Course Specific Information

It is your responsibility to follow up with Drs. Mullarkey and Schertzer immediately about the nature of the accommodation. Relief will be assessed on a case-by-case basis and is at the discretion of the instructor.

Academic Accommodation of Students with Disabilities

Students with disabilities who require academic accommodation must contact [Student Accessibility Services \(SAS\)](#) at 905-525-9140 ext. 28652 or sas@mcmaster.ca to make arrangements with a Program Coordinator. For further information, consult McMaster University's [Academic Accommodation of Students with Disabilities](#) policy.

Academic Accommodation for Religious, Indigenous Or Spiritual Observances (Riso)

Students requiring academic accommodation based on religious, indigenous or spiritual observances should follow the procedures set out in the [RISO](#) policy. Students should submit their request to their Faculty Office **normally within 10 working days** of the beginning of term in which they anticipate a need for accommodation or to the Registrar's Office prior to their examinations. Students should contact their instructors as soon as possible to make alternative arrangements for classes, assignments, and tests.

Courses with An On-Line Element

Some courses may use on-line elements (e.g. e-mail, Avenue to Learn (A2L), LearnLink, web pages, capa, Moodle, ThinkingCap, etc.). Students should be aware that, when they access the electronic components of a course using these elements, private information such as first and last names, user names for the McMaster e-mail accounts, and program affiliation may become apparent to all other students in the same course. The available information is dependent on the technology used. Continuation in a course that uses on-line elements will be deemed consent to this disclosure. If you have any questions or concerns about such disclosure, please discuss this with the course instructor.

Online Proctoring

Some courses may use online proctoring software for tests and exams. This software may require students to turn on their video camera, present identification, monitor and record their computer activities, and/or lock/restrict their browser or other applications/software during tests or exams. This software may be required to be installed before the test/exam begins.

The Use of Generative Artificial Intelligence

USE PROHIBITED

Students are not permitted to use generative AI in this course. In alignment with McMaster’s Academic Integrity policy, it, “shall be an offense knowingly to....submit academic work for assessment that was purchased or acquired from another source.” This includes work created by generative AI tools. Using Generative AI tools is a form of contract cheating. Charges of academic dishonesty will be brought forward to the Office of Academic Integrity.

Academic Integrity

You are expected to exhibit honesty and use ethical behaviour in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity.

It is your responsibility to understand what constitutes academic dishonesty.

Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: “Grade of F assigned for academic dishonesty”), and/or suspension or expulsion from the university. For information on the various types of academic dishonesty please refer to the [Academic Integrity Policy](#).

The following illustrates only three forms of academic dishonesty:

- plagiarism, e.g. the submission of work that is not one’s own or for which other credit has been obtained.
- improper collaboration in group work.
- copying or using unauthorized aids in tests and examinations.

Authenticity / Plagiarism Detection

Some courses may use a web-based service (Turnitin.com) to reveal authenticity and ownership of student submitted work. For courses using such software, students will be expected to submit their work electronically either directly to Turnitin.com or via an online learning platform (e.g. A2L, etc.) using plagiarism detection (a service supported by Turnitin.com) so it can be checked for academic dishonesty.

Students who do not wish their work to be submitted through the plagiarism detection software must inform the Instructor before the assignment is due. No penalty will be assigned to a student who does

not submit work to the plagiarism detection software. **All submitted work is subject to normal verification that standards of academic integrity have been upheld** (e.g., on-line search, other software, etc.). For more details about McMaster's use of Turnitin.com please go to the [McMaster Office of Academic Integrity's](#) webpage.

Conduct Expectations

As a McMaster student, you have the right to experience, and the responsibility to demonstrate, respectful and dignified interactions within all our living, learning and working communities. These expectations are described in the [Code of Student Rights & Responsibilities \(the "Code"\)](#). All students share the responsibility of maintaining a positive environment for the academic and personal growth of all McMaster community members, **whether in person or online**.

It is essential that students be mindful of their interactions online, as the Code remains in effect in virtual learning environments. The Code applies to any interactions that adversely affect, disrupt, or interfere with reasonable participation in University activities. Student disruptions or behaviours that interfere with university functions on online platforms (e.g. use of Avenue 2 Learn, WebEx or Zoom for delivery), will be taken very seriously and will be investigated. Outcomes may include restriction or removal of the involved students' access to these platforms.

Copyright and Recording

Students are advised that lectures, demonstrations, performances, and any other course material provided by an instructor include copyright protected works. The Copyright Act and copyright law protect every original literary, dramatic, musical and artistic work, **including lectures** by University instructors.

The recording of lectures, tutorials, or other methods of instruction may occur during a course. Recording may be done by either the instructor for the purpose of authorized distribution, or by a student for the purpose of personal study. Students should be aware that their voice and/or image may be recorded by others during the class. Please speak with the instructor if this is a concern for you.

Research Ethics

Students will meet with their supervisor to complete the "Initial Meeting Form". Students will also complete mandatory safety form(s) and an acknowledgement of confidentiality form. These forms

(available on A2L) are to be submitted to the A2L assignment folder by the specified due date, or you will not be allowed to do laboratory work.

Extreme Circumstances

The University reserves the right to change the dates and deadlines for any or all courses in extreme circumstances (e.g., severe weather, labour disruptions, etc.). Changes will be communicated through regular McMaster communication channels, such as McMaster Daily News, A2L and/or McMaster email.