

## MCB\*4510 - Research Project in Molecular and Cellular Biology

### Summer 2024 Course Outline

**Section: 01**

**Credits: 1.00**

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## Land Acknowledgement: Guelph

The University of Guelph resides on the ancestral lands of the Attawandaron people and the treaty lands and territory of the Mississaugas of the Credit. We recognize the significance of the Dish with One Spoon Covenant to this land and offer respect to our Anishinaabe, Haudenosaunee and Métis neighbours. Today, this gathering place is home to many First Nations, Inuit, and Métis peoples and acknowledging them reminds us of our important connection to this land where we work and learn.

## Calendar Description

This course involves independent research of a practical or theoretical nature on a specific topic in molecular and cellular biology. It is carried out under the supervision of an individual faculty member. Students should make arrangements with both a faculty advisor and the course coordinator at least one semester in advance of taking the course. The signature of the course coordinator will be required to select the course. A departmental registration form must be obtained from, and submitted to, the course coordinator no later than the 2nd class day of the semester in which the student is registered for the course.

**Prerequisite(s):** MCB\*4500. Normally, students must have completed 6 semesters in an appropriate program in the biological sciences. Minimum 70% cumulative average in science courses during the first 6 semesters of the relevant majors.

**Restriction(s):** Students in programs offering project courses cannot enroll in MCB\*4510. Grade requirements may be waived in exceptional circumstances at the discretion of faculty advisor and course coordinator. Course coordinator consent required.

**Department(s):** Department of Molecular and Cellular Biology

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## Course Description

The Research Project course 2 is a capstone course for students doing molecular bioscience research. The main qualities of the course are immersion in current research in a faculty advisor's laboratory, where students can apply their accumulated knowledge and experience to performing real research in a real laboratory setting.

## Lecture Schedule

The scheduling of your work in the research lab is based on discussion between you, your faculty advisor, and other lab members.

There is no final exam for this course.

## Instructor Information

Kelsey Pannunzio

Course Co-ordinator

Email: [kpannunz@uoguelph.ca](mailto:kpannunz@uoguelph.ca)

Office: SCC 3253

Office Phone: 1-519-824-4120 x56349

Your Faculty Advisor is the most important member of your Teaching team. Students should be sure that they know how to contact them for guidance and advice.

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## Learning Resources

### Required Resources

This course uses CourseLink (<https://courselink.uoguelph.ca/>) for the following:

- Deadlines for all assignments in the CourseLink Calendar
- Assignment outlines, grading rubrics with standards

#### **Software**

We will be using Zoom (<https://zoom.us>) in case presentations are being held online.

## **Recommended Resources**

### **High speed internet connection (Equipment)**

Although high speed connection to the internet is not required, it is highly recommended so that a better online experience with the tools, videos, and other materials used in the course can be achieved.

## **Campus Resources**

If you are concerned about any aspect of your academic program: Make an appointment with a Program Counsellor (<https://www.uoguelph.ca/uaic/programcounsellors/>) in your degree program. If you are struggling to succeed academically: There are numerous academic resources offered by the Learning Commons (<https://www.lib.uoguelph.ca/using-library/spaces/learning-commons/>) including, Supported Learning Groups for a variety of courses, workshops related to time management, taking multiple choice exams, and general study skills.

## **Course Learning Outcomes**

### **Course Level Learning Outcomes**

#### 1. Problem Solving and Critical Thinking

- Present and assess original research results they have generated through writing a scientific manuscript in the format used for submission to the journal Cell and making a scientific poster presentation of their research
- Evaluate the limits of and troubleshoot experimental approaches through hands on research

#### 2. Communication

- Write a scientific manuscript in the format used for submission to the journal Cell
- Deliver a poster presentation of their research to students and faculty

#### 3. Professional and Ethical Behaviour

- Work effectively and independently and in the context of a team, taking responsibility for their own research.
- Demonstrate good work ethic by setting goals and meeting deadlines.
- Add to their career planning by determining if they are capable of graduate school through direct experience with genuine research.

#### 4. Scientific Method

- Conduct and troubleshoot authentic experiments on a real research problem
- Record, analyze and interpret scientific data with relevant tools in a scientific manuscript and through a scientific poster presentation

#### 5. Breadth & Depth of Understanding in a Particular Discipline

- Demonstrate advanced, contemporary and relevant knowledge in the research area of their choice through written and oral communication.

#### 6. Scientific Technology & Techniques in a Scientific Discipline

- Conduct and troubleshoot experiments using relevant techniques, using relevant technologies as reported through a scientific manuscript and poster presentation.

## Teaching and Learning Activities

The primary activities of this course are the production of a literature review and research proposal for your research, an oral presentation of that proposal to an audience of your peers, and activity in a research group under the supervision of a faculty advisor.

### Responsibilities of the Students

(See Research Performance Rubric for how you will be assessed for your research work)

- Participate in real research in an area of your choice
- Initiate discussions with faculty advisor or others to solve problems
- Display independence in the lab
- Develop a strong grounding in the research area and produce a literature review and research proposal
- Deliver an oral presentation of your research proposal
- Begin experimentation toward your research goals

### Responsibilities of the Faculty Advisor

- Provides direction to the project
- Provides safety training and a safe environment in which to work
- Provides resources for the project, including mentoring, supplies, and certifications
- May assign a day-to-day mentor, but is ultimately responsible for supervision
- Assesses their student's written literature review and research proposal\*
- Assesses research proposal seminar presentations\*
- Assesses their student's semester research performance

\*In the rare instance when a faculty supervisor is unable to grade course assignments, the faculty supervisor is responsible for finding another faculty member to grade in their place.

### Responsibilities of the Course Coordinator

- Administers the course
- Organizes and communicates the structure of the course, including sign-up, course outlines, CourseLink, and assessments
- Provides access to the CourseLink page to all students and their faculty supervisors
- Schedules assessment deadlines
- Organizes seminar schedule
- Assigns second graders for the written report (of the two graders, at least one must be from the MCB department)
- Collects and reports course grades

## Assessment Breakdown

Details of all Assessments can be found on CourseLink (<https://courselink.uoguelph.ca/shared/login/login.html>)

Description	Weighting (%)	Due Date
Progress Report**	0%	June 20, 2024
Poster Presentation	20%	July 29th-August 1st, 2024
Scientific Manuscript	40%	Aug. 9, 2024
Research Performance	40%	
TOTAL	100%	

\*\* Ungraded Requirement and graded by: Faculty Advisor

## Assessment Details

### Presentation

#### Poster Presentation

**20%**

See Poster Presentation Rubric for details of the criteria assessed and standards.

**DATES:** July 29th-August 1st 2024; exact schedule will be provided on CourseLink

Students in MCB\*4510 are required to make and present a scientific poster similar to those presented at scientific conferences. You must prepare a poster summarizing your work and answer questions from faculty, and peers. Two faculty members will evaluate your poster and your knowledge of your research area, experimental design, results and conclusions.

Submit a PDF of your poster to the CourseLink Dropbox by the due date.

### Research Paper

#### Scientific Manuscript Writing

**40%**

See Scientific Manuscript Rubric for details of the criteria assessed and standards.

**DUE DATE:** August 9, 2024 at 4:00 pm

**SUBMISSION:** submit a pdf and a word document of your manuscript to the CourseLink Dropbox by the due date

**LATE PENALTIES:** 10% + 10% / day up to 50%, including weekends. A grade of zero will be assigned after 5 days late.

**Requirement:** You will write a manuscript that mimics the format and style of a submission to the journal Cell. Read and follow the requirements outlined for submissions to Cell and associated webpages. Things to note are the length limits for the Summary (150 words) and that the introduction "should be succinct, without subheadings..."

The introduction of your report for 4510 will therefore be very different than your literature review from 4500, requiring careful thought about the essential points needed for the reader to understand the context for the results.

**You cannot copy and paste material from your MCB\*4500 literature review. Material can be taken as the basis of your report, but you must rewrite it.**

Given MCB\*4510 is a continuation of your work in MCB\*4500, some overlap between MCB\*4500 and 4510 reports will be acceptable in the methods section.

Manuscripts that do not conform to the required format will be returned for revision and resubmission. Late penalties will be applied if the resubmission is after the due date.

Write your manuscript with a word processor. Insert your high-quality figures at the end of the submission. Please note that each figure is presented on its own page. It is also strongly suggested that you make use of referencing software to insert citations and format your final manuscript. Mendeley is powerful, free reference managing software that works across computer platforms and integrates with Word.

The final grade for the Scientific manuscript will include grades for clear, concise and grammatically correct writing. Proofreading your manuscript is essential for high quality writing. Therefore, plan your writing to have your first complete draft done a week to 5 days before the due date to provide time for others to proofread your work and allow you enough time to make the necessary changes.

**NOTE:** Technical breakdowns are not a valid reason for requesting an accommodation. Important documents and drafts of documents should ALWAYS be backed up.

### Performance

#### Laboratory Performance

**40%**

See Research Performance Rubric for details of the criteria assessed and standards.

Students should realize that it is important that the experiments and analyses are done logically and thoroughly, so that results can be meaningfully interpreted. A lack of positive results in their project will not lead to a lower grade, as long as what has been done has been properly carried out.

"Negative" results may be useful if they demonstrate that an initial hypothesis was wrong, or if it can be shown that the experimental procedures used were not appropriate.

## Last Day to Drop Course

The final day to drop Summer 2024 courses without academic penalty is the last day of classes: August 02

After this date, a mark will be recorded, whether course work is completed or not (a zero is assigned for missed tests/assignments). This mark will show on the student's transcript and will be calculated into their average.

## Course Grading Policies

### Submission of Assignments

Assessments for this course should be submitted electronically via the online Dropbox tool. When submitting your file using the Dropbox tool, do not leave the page until your file has successfully uploaded. To verify that your submission was complete, you can view the submission history immediately after the upload to see which files uploaded successfully. The system will also email you a receipt. Save this email receipt as proof of submission. Be sure to keep a back-up copy of all of your files in the event that they are lost in transition. In order to avoid any last-minute computer problems, your instructor strongly recommend you save your files to a cloud-based file storage (e.g., Google Docs), or send to your email account, so that should something happen to your computer, the file could still be submitted on time or re-submitted.

It is your responsibility to submit your documents on time as specified on the Schedule. Be sure to check the technical requirements and make sure you have the proper computer, that you have a supported browser, and that you have reliable Internet access. Remember that technical difficulty is not an excuse not to turn in your assignment on time. Don't wait until the last minute as you may get behind in your work.

### Resolving Conflict

Working in teams can involve differences of opinions or personalities. If you experience a conflict with a member of your lab, bring this conflict to the attention of your faculty advisor for help. If you experience a conflict with your faculty advisor that you are not able to resolve on your own, contact the Chair of the Department of Molecular and Cellular Biology for advice and assistance.

### Use of Turnitin

In this course, we will be using Turnitin, integrated with the CourseLink Dropbox tool, to detect possible plagiarism, unauthorized collaboration or copying as part of the ongoing efforts to maintain academic integrity at the University of Guelph.

All submitted assignments will be included as source documents in the Turnitin.com reference database solely for the purpose of detecting plagiarism of such papers. Use of the Turnitin.com service is subject to the Usage Policy posted on the Turnitin.com site.

A major benefit of using Turnitin is that students can educate and empower themselves in preventing academic misconduct. In this course, you may screen your own assignments through Turnitin as many times as you wish before the due date. You will be able to see and print reports that show you exactly where you have properly and

## Department of Molecular and Cellular Biology Statements

### Academic Advisors

If you are concerned about any aspect of your academic program. Please make an appointment with a program counsellor in your degree program. B.Sc. Academic Advising (<https://bsc.uoguelph.ca/>) or Program Counsellor (<https://www.uoguelph.ca/uaic/programcounsellors/>)

### Academic Support

Science Commons: Located in the library, the Science Commons provides support for physics, mathematic/statistics, and chemistry. Details on their hours of operations can be found at: Chemistry / Physics Help (<http://www.lib.uoguelph.ca/getassistance/studying/chemistry-physics-help/>) and Math / Statistics Help (<http://www.lib.uoguelph.ca/getassistance/studying/math-stats-help/>)

### Course Offering Information Disclaimer

Please note that course delivery format (face-to-face vs online) is subject to change up to the first-class day depending on requirements placed on the University and its employees by public health bodies, and local, provincial and federal governments. Any changes to course format prior to the first class will be posted on WebAdvisor/Student Planning (<https://www.uoguelph.ca/webadvisor/>) as they become available.

### Online Behaviour

Inappropriate online behaviour will not be tolerated. Examples of inappropriate online behaviour include:

- Posting inflammatory messages about your instructor or fellow students
- Using obscene or offensive language online
- Copying or presenting someone else's work as your own
- Adapting information from the Internet without using proper citations or references
- Buying or selling term papers or assignments
- Posting or selling course materials to course notes websites
- Having someone else complete your quiz or completing a quiz for/with another student
- Stating false claims about lost quiz answers or other assignment submissions

- Threatening or harassing a student or instructor online
- Discriminating against fellow students, instructors and/or TAs
- Using the course website to promote profit-driven products or services
- Attempting to compromise the security or functionality of the learning management system
- Sharing your username and password
- Recording lectures without the permission of the instructor

## Personal Information

Personal information is collected under the authority of the University of Guelph Act (1964), and in accordance with Ontario's Freedom of Information and Protection of Privacy Act (<http://www.e-laws.gov.on.ca/index.html.html>) (FIPPA). This information is used by University officials in order to carry out their authorized academic and administrative responsibilities and also to establish a relationship for alumni and development purposes.

For more information regarding the Collection, Use and Disclosure of Personal Information policies (<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/intro/index.shtml/>) please see the Undergraduate Calendar.

## Wellness

If you are struggling with personal or health issues:

- Counselling services (<https://www.uoguelph.ca/counselling/>) offers individualized appointments to help students work through personal struggles that may be impacting their academic performance.
- Student Health Services (<https://www.uoguelph.ca/studenthealthservices/clinic/>) is located on campus and is available to provide medical attention.
- For support related to stress and anxiety, besides Health Services and Counselling Services, Kathy Somers runs training workshops (<http://www.selfregulationskills.ca/>) and one-on-one sessions related to stress management and high performance situations.

## Standard Statements for Undergraduate Courses

### Academic Integrity

The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community – faculty, staff, and students – to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

The Academic Misconduct Policy (<https://calendar.uoguelph.ca/undergraduate-calendar/undergraduate-degree-regulations-procedures/academic-misconduct/>) is outlined in the Undergraduate Calendar.

### Accessibility

The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required; however, interim accommodations may be possible while that process is underway.

Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability. Use of the SAS Exam Centre requires students to make a booking at least 10 days in advance, and no later than the first business day in November, March or July as appropriate for the semester. Similarly, new or changed accommodations for online quizzes, tests and exams must be approved at least a week ahead of time. For students at the Guelph campus, information can be found on the SAS website. (<https://www.uoguelph.ca/sas/>)

### Accommodation of Religious Obligations

If you are unable to meet an in-course requirement due to religious obligations, please email the course instructor within two weeks of the start of the semester to make alternate arrangements.

See the Academic calendar for information on regulations and procedures for Academic Accommodations of Religious Obligations (<https://calendar.uoguelph.ca/undergraduate-calendar/undergraduate-degree-regulations-procedures/academic-accommodation-religious-obligations/>).

## Copies of Out-of-class Assignments

Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

## Drop Date

Students will have until the last day of classes to drop courses without academic penalty. The deadline to drop two-semester courses will be the last day of classes in the second semester. This applies to all undergraduate students except for Doctor of Veterinary Medicine and Associate Diploma in Veterinary Technology (conventional and alternative delivery) students. The regulations and procedures for course registration are available in the Undergraduate Calendar - Dropping Courses (<https://calendar.uoguelph.ca/undergraduate-calendar/undergraduate-degree-regulations-procedures/dropping-courses/>).

## Email Communication

As per university regulations, all students are required to check their <uoguelph.ca> e-mail account regularly: e-mail is the official route of communication between the University and its students.

## Health and Wellbeing

The University of Guelph provides a wide range of health and wellbeing services at the Vaccarino Centre for Student Wellness (<https://wellness.uoguelph.ca/>). If you are concerned about your mental health and not sure where to start, connect with a Student Wellness Navigator (<https://wellness.uoguelph.ca/navigators/>) who can help develop a plan to manage and support your mental health or check out our mental wellbeing resources (<https://wellness.uoguelph.ca/shine-this-year/>). The Student Wellness team are here to help and welcome the opportunity to connect with you.

## Illness

Medical notes will not normally be required for singular instances of academic consideration, although students may be required to provide supporting documentation for multiple missed assessments or when involving a large part of a course (e.g., final exam or major assignment).

## Recording of Materials

Presentations that are made in relation to course work—including lectures—cannot be recorded or copied without the permission of the presenter, whether the instructor, a student, or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

## Resources

The Academic Calendars (<http://www.uoguelph.ca/registrar/calendars/?index>) are the source of information about the University of Guelph's procedures, policies and regulations which apply to undergraduate, graduate and diploma programs.

## When You Cannot Meet a Course Requirement

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. See the Undergraduate Calendar for information on regulations and procedures for Academic Consideration. (<https://calendar.uoguelph.ca/undergraduate-calendar/undergraduate-degree-regulations-procedures/academic-consideration-appeals-petitions/>)