



MCB*4500 Research Project in Molecular and Cellular Biology I

Winter 2024

Section(s): 01

Department of Molecular and Cellular Biology

Credit Weight: 1.00

Version 1.00 - January 05, 2024

1 Course Details

1.1 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.

Pre-Requisites: MBG*3350 or equivalent laboratory experience at the discretion of the student's faculty advisor. Normally, students must have completed 6 semesters in an appropriate program in the biological sciences

Restrictions: Minimum 70% cumulative average in science courses during the first 6 semesters of the relevant majors. Students in programs offering project courses cannot enroll in MCB*4500. Grade requirements may be waived in exceptional circumstances at the discretion of faculty advisor and course coordinator. Course coordinator consent required.

1.2 Course Description

1.3 Timetable

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

Please note the proposed course format, schedule or location for the Winter 2024 semester may change up to the first day of classes due to personnel, resource, and public health circumstances and if conditions cannot be met to ensure the safety of our students and instructors. Continue to watch the Student Planning website as format information could be updated until the first day of classes.

1.4 Final Exam

There is no final exam for this course

2 Instructional Support

2.1 Instructional Support Team

Course Co-ordinator: Kelsey Pannunzio
Email: kpannunz@uoguelph.ca
Telephone: 519-824-4120 Ext. 56349
Office: SSC3253

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.

3 Learning Resources

3.1 Required Resources

Courselink (Website)

<https://courselink.uoguelph.ca>

There is a Courselink site for this course. Information on the Courselink site include:

- Deadlines for all assignments in the Courselink Calendar
- Assignment outlines, grading rubrics with standards
- Course outline

Zoom or Microsoft Teams (Software)

In case seminars/meetings cannot be held in-person, we will be using either Zoom (<https://zoom.us>) or Microsoft Teams for meetings, sessions and presentations in this course.

3.2 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.

4 Learning Outcomes

The Research Project course 1 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.

4.1 Intended Learning Outcomes

If students work diligently, they will:

1. Problem Solving and Critical Thinking

- Practice gathering and critically assessing the primary literature through completion of a literature review and research proposal in their chosen research area
- Report proposed experiments to advance an area of research as part of a research proposal
- Evaluate the limits of and troubleshoot experimental approaches as part of their research proposal and through hands on research

2. Communication

- Compose a written literature review and research proposal
- Deliver an effective short oral presentation and answer questions regarding their research proposal from an audience of their peers

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

- Design and conduct authentic experiments on a real research problem as reported through a research proposal and oral presentation
- Interpret scientific data with relevant tools through their research proposal and oral 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

- Design and conduct experiments using relevant techniques, using relevant technologies as reported through a research proposal and oral presentation

5 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.

5.1 Responsibilities

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

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 the literature review and research proposal of one other MCB*4500 student per each student they advise as assigned by the course coordinator**
- **At least one of the graders of each literature review and research proposal will be a faculty member of MCB**
- 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.

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 students' literature review and research proposal papers
- Collects and reports course grades

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.

6 Assessments

6.1 Methods of Assessment

| Form of Assessment | Weight of Assessment | Due Date (2024) | Graders |
|----------------------------------|----------------------|------------------|-----------------|
| 1. Safety Training Documentation | Ungraded requirement | Monday Feb 5th | Faculty Advisor |
| 2. Progress Report | Ungraded requirement | Monday, Feb 19th | Faculty Advisor |

| Form of Assessment | Weight of Assessment | Due Date (2024) | Graders |
|--|-----------------------------|--|--|
| 3. Seminar Presentation | 20% | Dropbox March 29th Seminar: April 1st-April 5th | 2+ faculty members |
| 4. Literature Review and Research Proposal <i>(includes brief reflection component)</i> | 40% | Friday April 12th @ 11:59 PM | Faculty advisor + one other faculty member |
| 5. Research Performance | 40% | Friday April 12th | Faculty advisor |

6.2 LITERATURE REVIEW AND RESEARCH PROPOSAL (and brief reflection) – 40%

See *Literature Review and Research Proposal* Rubric for details of the criteria assessed and standards.

SUBMISSION: submit a pdf and a word copy of your paper 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.

Requirements: 20 pages double-spaced, margins 1-inch all around, 12-pt Times or 11-pt Arial font. Page limits do not include a **required** Title page and list of references. Use the in-text citation style used in the journal *Cell*. **Discuss the format and contents with your Advisor as they will be grading the paper along with another faculty member.**

Papers 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.

The literature review presents a critical review of the literature and a rationale for the research. The focus is on the biological (less than the technical) aspects of your research project.

The research proposal must outline the objectives of your research and outline the experiments (including methods) planned to meet those objective. Potential pitfalls and alternatives should be addressed. A timeline to completion is advised. Please see the **Student Information Paper** document on CourseLink for further information and advice. *In particular*, note the following:

While you are not expected to include data, you may show preliminary data to demonstrate the feasibility of your proposal. Control experiments that show a certain technique works or a DNA gel showing your production of a construct you will be using in your work are some examples.

The reflection component is in conjunction with the Experiential Learning Team. Students will reflect upon and describe their experiences in MCB*4500. Students will focus on lessons learned, and how these can be applied outside this course.

See course content and rubric on CourseLink for further details regarding the reflection.

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

6.3 SEMINAR PRESENTATIONS – 20%

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

DATES: Seminar PowerPoint file DUE in Dropbox, March 29th, 2024

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

Seminar presentation scheduled April 1-5 2024 (In-person); exact schedule TBD.

A 12-minute presentation followed by a 3-minute question period. Marks will be deducted for going over time.

You are expected to attend all seminars in the session (2 hrs) in which you present your seminar.

PowerPoint presentations are strongly encouraged.

Seminars are graded based on:

- demonstration of understanding in your area of study
- developing a hypothesis and / or objectives
- distilling the most important ideas
- oral presentation skills
- delivering an effective presentation to an audience of your peers

(see *Seminar Presentation* rubric for full details and standards)

Students are encouraged to discuss their seminar presentations with their faculty advisor and lab colleagues well in advance of their seminar date to obtain feedback with time to make changes.

6.4 RESEARCH 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.

6.5 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 improperly referenced the outside sources and materials in your assignment.

7 Course Statements

7.1 Grading

Indicate all course policies regarding in-semester tests and assignment submissions, including time and place for submission of assignments and explicit penalties for late submissions.

7.2 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.

8 Department of Molecular and Cellular Biology Statements

8.1 Academic Advisors

If you are concerned about any aspect of your academic program:

- Make an appointment with a program counsellor in your degree program. [B.Sc. Academic Advising](#) or [Program Counsellors](#)

8.2 Academic Support

If you are struggling to succeed academically:

- Learning Commons: There are numerous academic resources offered by the Learning Commons including, Supported Learning Groups for a variety of courses, workshops related to time management, taking multiple choice exams, and general study skills. You can also set up individualized appointments with a learning specialist.
<http://www.learningcommons.uoguelph.ca/>
- 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: <http://www.lib.uoguelph.ca/get-assistance/studying/chemistry-physics-help> and <http://www.lib.uoguelph.ca/get-assistance/studying/math-stats-help>

8.3 Wellness

If you are struggling with personal or health issues:

- Counselling services offers individualized appointments to help students work through personal struggles that may be impacting their academic performance.

<https://www.uoguelph.ca/counselling/>

- Student Health Services is located on campus and is available to provide medical attention. <https://www.uoguelph.ca/studenthealthservices/clinic>
- For support related to stress and anxiety, besides Health Services and Counselling Services, Kathy Somers runs training workshops and one-on-one sessions related to stress management and high performance situations.
<http://www.selfregulationskills.ca/>

8.4 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 (FIPPA) <http://www.e-laws.gov.on.ca/index.html>. 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 please see the Undergraduate Calendar.
(<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/intro/index.shtml>)

8.5 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 as they become available.

9 University Statements

9.1 Email Communication

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

9.2 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. The grounds for Academic Consideration are detailed in the Undergraduate and Graduate Calendars.

Undergraduate Calendar - Academic Consideration and Appeals
<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml>

Graduate Calendar - Grounds for Academic Consideration
<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml>

Associate Diploma Calendar - Academic Consideration, Appeals and Petitions
<https://www.uoguelph.ca/registrar/calendars/diploma/current/index.shtml>

9.3 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 students (undergraduate, graduate and diploma) 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 their respective Academic Calendars.

Undergraduate Calendar - Dropping Courses
<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml>

Graduate Calendar - Registration Changes
<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/genreg-reg-regchg.shtml>

Associate Diploma Calendar - Dropping Courses
<https://www.uoguelph.ca/registrar/calendars/diploma/current/c08/c08-drop.shtml>

9.4 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.

9.5 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 14 days in advance, and no later than November 1 (fall), March 1 (winter) or July 1 (summer). Similarly, new or changed accommodations for online quizzes, tests and exams must be approved at least a week ahead of time.

For Guelph students, information can be found on the SAS website
<https://www.uoguelph.ca/sas>

For Ridgetown students, information can be found on the Ridgetown SAS website
<https://www.ridgetownc.com/services/accessibilityservices.cfm>

9.6 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 encourages academic integrity. 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.

Undergraduate Calendar - Academic Misconduct

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml>

Graduate Calendar - Academic Misconduct

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml>

9.7 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.

9.8 Resources

The Academic Calendars are the source of information about the University of Guelph's procedures, policies, and regulations that apply to undergraduate, graduate, and diploma programs.

Academic Calendars

<https://www.uoguelph.ca/academics/calendars>

9.9 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).
