University of Guelph
College of Biological Science
Department of Molecular and Cellular Biology
COURSE OUTLINE
MCB*4510 Research Project in Molecular & Cellular Biology 2
Summer 2016

Course 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.

* Departmental registration form is the Research Agreement enclosed in this document below

(0-12) [1.00]

Prerequisite(s): MCB*4500

Restriction(s): 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.

Teaching team

The course co-coordinator is:

Prof. John Dawson. (Rm. 2248, Science Complex, email: jdawso01@uoguelph.ca)

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.

Course schedule

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

Learning goals and rationale

The Research Project course 2 is an extension of the Research Project course 1 and the final undergraduate capstone course for students doing molecular bioscience research. The main qualities of the course are immersion in real, current research going on in a faculty advisor's laboratory, where students can apply their accumulated knowledge and experience to performing real research in a real laboratory setting.

Intended Learning Outcomes
If students work diligently, they will:

1. Problem Solving and Critical Thinking
a. 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
b. Evaluate the limits of and troubleshoot experimental approaches through hands on research

2. Communication
a. Write a scientific manuscript in the format used for submission to the journal *Cell*
b. Deliver a poster presentation of their research to students and faculty

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

4. Scientific Method
a. Conduct and troubleshoot authentic experiments on a real research problem
b. 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
a. 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
a. Conduct and troubleshoot experiments using relevant techniques, using relevant technologies as reported through a scientific manuscript and poster presentation

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

- Deadlines for all assignments in the Courselink Calendar
- A means of communicating your class schedules to the Coordinator so they can arrange the scheduling of student seminars (see methods of assessment below)
- Assignment outlines, grading rubrics with standards
- This course outline

Course Content

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.

Responsibilites:

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
- Conduct research in the laboratory
- Prepare a scientific manuscript outlining the research
- Present a scientific poster to other students and faculty

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 scientific manuscript*
  - Finds another faculty member to assess the scientific manuscript
  - Of the two graders, at least one must be a faculty from the MCB Department
- Assesses poster 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
- 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.

Methods of Assessment

Students will find details of all Assessments on CourseLink.

Assessment Form of Assessment	Weight of Assessment	2016 Due Date	Graders
1. Progress Report	Ungraded requirement	June 22	Faculty Advisor
2. Poster Presentation	30%	TBD – August 3-5	Faculty members
3. Scientific Manuscript	30%	Mon, August 15 @ 4 PM	Faculty advisor + one other faculty member
4. Research Performance	40%		Faculty advisor

POSTER PRESENTATIONS – 30%

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

DATES: August 3-5, 2016; exact schedule TBD

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.

SCIENTIFIC MANUSCRIPT WRITING – 30%

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

DUE DATE: Mon, August 15, 2016 at 4:00 pm

SUBMISSION: submit a pdf of your manuscript to the Courselink Dropbox by the due date

LATE PENALTIES: 10% / day up to 50%. A grade of zero is 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

The introduction "should be succinct, with ot 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.

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.

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.

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.

Important Dates

A list of important dates is available in the Undergraduate Calendar.

Course and University Policies

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.

Accessibility

The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability or a short-term disability should contact Student Accessibility Services (formerly the Centre for Students with Disabilities) as soon as possible.

For more information, contact Student Accessibility Services at 519-824-4120 ext. 56208 or email csd@uoguelph.ca.

Academic Misconduct

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 is detailed in the Undergraduate Calendar.

E-mail 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.

Drop Date

The last date to drop one-semester courses, without academic penalty, is the 40th class day. To confirm the actual date please see the schedule of dates in the Undergraduate Calendar. For regulations and procedures for Dropping Courses, see the Undergraduate Calendar.

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.

Recording of Materials

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

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.

Campus Resources

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

Make an appointment with a Program Counsellor in your degree program.

If you are struggling to succeed academically:

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.

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.

Student Health Services 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 and one-on-one sessions related to stress management and high performance situations.

If you have a documented disability or think you may have a disability:

Student Accessibility Services (SAS) formerly Centre for Students with Disabilities can provide services and support for students with a documented learning or physical disability. They can also provide information about how to be tested for a learning disability.