

RESEARCH PROJECTS IN MOLECULAR AND CELLULAR BIOLOGY

MCB*4500 Projects 1 and MCB*4510 Projects 2

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 supervisor 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.

ADMINISTRATION

The course coordinator is Dr. Marc Boileau. (Rm. 3482, Science Complex, email: boileau@uoguelph.ca). Students are expected to complete all arrangements with a faculty supervisor and submit a signed Research Agreement (enclosed) to the Coordinator before the first week of classes. **All students must attend the course meeting during the first week of classes.**

PREREQUISITES

MBG*3350 or equivalent laboratory experience at the discretion of the student's project advisor. 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.

COURSE REQUIREMENTS

Projects 1	The student should become familiar with the background literature of the research project. A research plan should be defined in consultation with the Advisor and experiments initiated. The time spent completing a detailed literature review, learning new techniques and initiating experiments will average at least 20 hours per week. Note: Due to the diversity in research projects, the time spent in the lab may vary from week to week during the semester.
MCB*4500	<u>Deliverables (exact due dates found in the CourseLink Schedule)</u> <ol style="list-style-type: none"> 1. Safety Training Documentation (10th day of classes). 2. Seminar 1 presentation and critiques (normally during the 4th or 5th week of semester). 3. Progress Interview (6th week of classes). 4. Final Presentation (Seminar 2-during the final week of semester). 5. Project Report submitted to the Course Coordinator and the Faculty Advisor (last day of regular classes).
Projects 2	Students should begin new or continue experiments started in the first semester, spending on average at least 20 hours per week in the lab. There is no mid term presentation in this course; only a Final Presentation.
MCB*4510	<u>Deliverables (exact due dates found in the CourseLink Schedule)</u> <ol style="list-style-type: none"> 1. Progress Interview (6th week of classes). 2. Final Presentation (Poster-during the final week of the semester). 3. Project Report submitted to the Course Coordinator and the Faculty Advisor (last day of regular classes).

GRADING/ASSESSMENTS

Students will be assessed on their Laboratory work, Presentations, Participation and Reports in each course separately. Assessments for these components will be the result of evaluations provided by the Advisor, Coordinator and/or Department-Faculty members.

LABORATORY

Some factors which contribute to your assessment in the laboratory include: knowledge of the literature related to the rationale and objectives of your research project, ability to design experiments including the necessary controls, presentation and critical assessment of data, completion of experiments, organization of time, interaction with others in the laboratory, development of independence and technical competence.

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.

PRESENTATIONS

Students in MCB*4500 are required to make two presentations. The first is a five-minute seminar that focuses on the biological (not technical) aspects of the student's research project. **This seminar should put your project in its biological context.** The second and Final Presentation is also a seminar that is given in the final week of the semester. It is a 12-minute presentation followed by a 3-minute question period. You are expected to attend all seminars in the session in which you present your seminar. Participation (asking questions) is expected and will also be evaluated.

The seminars should be informative and understandable for members of the audience who are not experts in the field. The presentation should be organized in a logical and concise manner. The hypothesis should be clearly stated with reference to pertinent background information. The presentation should include carefully prepared, and well-labelled, original diagrams, tables and figures, which enhance a presentation only if they make the data easier to follow. PowerPoint presentations are strongly encouraged. The data should be summarized and interpreted, relating the results to the hypothesis and future research. Judges will evaluate each seminar based on clarity of presentation, demonstration of effort throughout the course and knowledge of the subject. Students should feel free to discuss their seminar presentations with their Advisor, lab colleagues and with the course coordinator.

Students in MCB*4510 are required to make a single, Final, presentation. The Final Presentation via a poster is another way of presenting work at a scientific conference. You prepare a poster summarizing your work and answer questions from faculty, and departmental passers-by. This is given in the final week of MCB*4510 and summarizes the work of the project.

PROJECT REPORT

A written report is submitted to the Advisor and course coordinator at the end of the semester for both MCB*4500 and MCB*4510. This report should be in the form of a scientific paper, such as in standard scientific journals, e.g., Genetics, Journal of Molecular Biology, Cell or Molecular and Cellular Biology. Students should consult the "Guide to Authors" for the journal they intend to use for their manuscript. Students should prepare the report in an unformatted manuscript form, with spacing etc. as required by the journal model chosen but not in a formatted "galley proof" style. The title page should indicate clearly what journal model was used.

The first semester's report should include an appropriate review of the literature, the experimental procedures and rationale, and discussion of any results. The second semester's report should focus upon a presentation and analysis of the results and their relevance as well as a discussion of any major issues of experimental procedure and interpretation.

Reports should be written in a clear, concise and grammatically correct style and contain an abstract, introduction, objectives, material and methods, results, discussion and reference list. The abstract should include a summary of the research completed. The introduction should summarize background information pertinent to the hypothesis, objectives and experimental strategy used in the experiments. Material and Methods should be in sufficient detail so that a co-worker would be able to repeat the experiments based on the information provided. Data should be presented in well designed and labeled, original (your own) tables and figures. The rationale for each experiment and a summary of the data, highlighting important or key results and controls, should be presented in a logical and concise manner. The Discussion should include a detailed interpretation of the experiments, relating the conclusions to the hypothesis, pertinent literature and future studies. The reference list should be accurate, complete and include a complete list of authors and title for each article cited.

Registering in Molecular and Cellular Biology Research Projects MCB*4500

Students in these courses do independent research under the supervision of individual faculty. You must have identified and confirmed a supervisor before you can register and begin your Project course.

Instructions for students:

The following steps must be completed before you can register in a Research Projects program

1. You must be a Molecular Biology and Genetics or Microbiology major.
2. You must successfully complete MBG*3350 Laboratory Methods in Molecular Biology and Genetics. We recommend that your cumulative average be **70% or better**. If you do not have a 70%, we recommend that you register in the Topics course of your respective program.
3. You must identify a faculty member who is willing to provide lab space, resources and supervision to you in the research project courses. Potential supervisors should be contacted at least one semester before you register in your project course. Supervisors can be from any Department at the University of Guelph provided that their research involves molecular biology, genetics and/or microbiology.
4. ***After you have decided on an advisor you should confirm the commitment of the faculty member. Complete (including signatures) the Project Agreement (attached below).***
5. When you have secured an advisor, you should make an appointment to meet with the Course Coordinator. Dr. Marc Boileau (boileau@uoguelph.ca), must sign your Course Waiver Request form before you can be registered.

Research Projects in MCB

Research Project Agreement

We hereby indicate that we agree to conduct the named project according to these principles.

The supervisor will provide the appropriate resources and supervision for the project to be carried out. The supervisor will be available to participate in the MCB Research Projects Program as identified by the Coordinator. The supervisor will also ensure that the student receives a Safety Orientation in accordance with the University Safety Policy 851.06.10 and the host Department. The University Policy requires that the student will also receive project appropriate safety training within the first week of the semester when entering to work in a new laboratory. The supervisor will complete the Progress Interview document indicating any improvements required of the student (if any) as prescribed by the Course Program as prescribed by the Coordinator.

The student confirms that they have successfully attained all of the Course Prerequisites*. The student will invest the appropriate time and effort to carry out the project and the course. The time required for students to complete a detailed literature review, learn new techniques and initiate experiments will average at least 20 hours per week. However, due to the diversity in research projects and students, the time spent in the lab may vary among projects, students and from week to week during the semester. The student agrees that they have an understanding of the commitment that will be required of them for this particular project. The student will be responsible for submitting all course deliverables to the Course Co-ordinator and specifically, the Student Safety Orientation record.

Where the student's performance is not satisfactory to the supervisor during the first semester, the supervisor is not obliged to invite the student to return for the Research Projects 2 (MCB*4510).

* **Lab Methods MBG*3350; 70% Science Course Average; 15 Credits: Prerequisite deficiencies must be approved by the Supervisor and Coordinator.**

Please print	Circle your major:	MBG	MICR	Other _____
Student's name:				
E-mail address:				
Supervisor:				
Department:				
E-mail address:				
Lab extension:				
Office extension:				
Title of project: (required)				

Signatures: Student:

Supervisor:

Date: _____

Date: _____