RESEARCH IN BIOMEDICAL SCIENCES COURSES
BIOM*4510 or BIOM*4521/2

Course Description and Requirements

In the Department of Biomedical Sciences, two, double-weighted over 1 or 2 semester, research course formats are available. The courses are:

(a) **BIOM*4510** (double-weighted in 1 semester; 1.0 credits)
or
(b) **BIOM*4521/2** (double-weighted in 2 subsequent semesters; 2.0 credits)

Objectives
These research courses are designed to expose students to biomedical research where information is created, interpreted and integrated with current knowledge, and to teach effective skills for communicating scientific information orally and in writing.

Goals
The specific goals of these courses are to: (a) develop an appreciation for research, (b) improve library skills by researching the literature on a specific topic, (c) develop awareness of current research techniques, (d) develop the techniques and attitudes of critical thinking through evaluation of research data, (e) teach problem solving and troubleshooting in an experimental setting, and (f) improve written and oral communication skills. The courses are designed to give the student a realistic view of biomedical research by providing an opportunity for 'hands-on' discovery.

It is important to realize that these courses are at the undergraduate level where the emphasis should be on a small well-defined problem, with a reasonably likelihood of success. Students will not be penalized when a project fails due to circumstances beyond their control.

Faculty and Student Commitments
The '0-12' hr/week labels for these courses in the Undergraduate Calendar should be regarded as the absolute minimum time commitment for students. In other courses, students are expected to work on course material after lectures and laboratories are finished, thus research course students can expect to spend on average approximately double the listed time/week to complete their experimental work. Students are reminded that these research courses do not have scheduled contact hours, and thus apparent large gaps in their weekly schedule represent time that they should be devoting to these projects, rather than time available for extracurricular events. Students should plan their semester schedule accordingly, and for students enrolled in BIOM*4521/2, the expectation is that approximately equal activity will occur in both semesters. If a student feels that a problem is arising with workload, he/she must talk to the supervisor about either becoming more efficient, or limiting the project as appropriate. Students should also feel free to talk to the course coordinator when problems with workload arise.

Academic Misconduct
The University takes a serious view of academic misconduct and will severely penalize students, faculty and staff who are found guilty of offences associated with misappropriation of others' work, misrepresentation of personal performance and fraud, improper access to scholarly resources, and obstructing others in pursuit of their academic endeavours. In addition to this policy, the University has adopted a number of policies that govern such offences, including the policies on Misconduct in

Research and Scholarship and the Student Rights and Responsibilities regulations. These policies will be strictly enforced.

Details of the University of Guelph policies on Academic Misconduct, including penalties to be imposed can be found at:
http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml

Course Evaluation

Two weeks before the end of the semester, students will be asked to complete a course evaluation by going to the CCS evaluation web site and completing the evaluation for your particular course.

https://courseeval.uoguelph.ca/CEVAL_LOGIN.php

Your feedback is vital for us to assess the impact of the research courses and to fine-tune the way these courses are run. All ratings and any comments will be anonymous unless you choose to identify yourself, and will not be provided to the course coordinator until after the end of each semester.

Methods of Evaluation

BIOM*4510
a) Formal Seminar Presentation - 30%
b) Evaluation of your colleagues' seminars (5 in total) - 5%
c) Final Written Report in the form of a research project paper - 35% (2 reviewers)
d) Assessment by the Supervisor* - 30%

BIOM*4521
a) Abstract of Research Project, maximum 500 words - 15%
b) Formal Seminar Presentation - 30%
c) Evaluation of your colleagues' seminars (5 in total) - 5%
d) 1st Written Report in the form of a research project paper - 30% (2 reviewers)
e) Assessment by the Supervisor of 1st semester's work* - 20%

BIOM*4522
a) Formal Seminar Presentation on the entire project - 35%
b) Evaluation of your colleagues' seminars (5 in total) - 5%
e) 2nd Written Report in the form of a research project paper, on the entire project - 40% (2 reviewers)
f) Assessment by the Supervisor of 2nd semester's work* - 20%

* The supervisor's assessment should include factors such as: interaction with others on the laboratory, organization of time, preparation for meetings, development of technical competence and quality of laboratory notes, etc . The student should discuss the specific criteria for this assessment with the supervisor before the project begins.

The Formal Seminar

All students are required to give an oral presentation. This formal seminar in BIOM*4510 and BIOM*4521 will be presented using the 10/5 format commonly used in scientific meetings - a 10 minute presentation and a 5 minute question period.

The formal seminar in BIOM*4522 will be 15 minutes in length with 5 minutes for questions. In all cases the emphasis in the presentation, and in the evaluation, should be on development of logical ideas and on effective communication.

Ideally, the seminar should include the following components (headings are not necessary):

• an Introduction - general terms to orient the audience and provide background information.
• Objectives/Hypothesis - definition of the scope of the experimental project.
• Methodology/Experimental Design - this will provide an overview of the methods used.
• Experimental Results
• Discussion of Results
• Summary/Conclusions - review of the main points and concise conclusions.

Seminar Preparation:
All seminars are to be computer-generated presentations using MS Powerpoint 2010 only. Supplemental audiovisual aids are not permitted. The presenter must keep in mind the time restrictions for the seminar. The presentations will be timed. All students registered in the Biomedical Sciences Research Project courses require a network account (this will be set up for you). With this network account, students have access to the 'V' drive, and will be able to use the computers in OVC for: (a) word processing; (b) searching for literature and saving references with abstracts; (c) reading Current Contents ; (d) organizing your references; (e) producing visual materials for your seminars, and (f) sending and receiving e-mail (we will use e-mail and CourseLink to correspond with you during the semester). The computers in the Biomedical Sciences' seminar rooms (Rm 1642 & 3648) have been upgraded to Windows XP and Powerpoint 2010.

Specific rehearsal times will be provided in the week before the seminars. A sign-up sheet will be set up the week before rehearsals begin.

***NOTE:** All seminar presentations must be brought, or e-mailed, to Kim Best for loading to the 'V' drive -V:\Workgroup_Shares\Biomed Research Presentations\Place presentations here - by 8:00a on the day of your seminar. If not received by the required time, 5 marks will be deducted from your final average. (This process precludes rebooting the computer between presentations. All material for your presentation MUST be uploaded as described above)

Seminar Presentation:
Specific days have been designated for the seminar presentations. After soliciting student/supervisor input (*Seminar Questionnaire*), a program will be scheduled for a specific timeslot of these days. Every attempt will be made to accommodate your first choice of day/time (am/pm). It is important that your presentation be thoroughly rehearsed to ensure that it meets the time restrictions for the assignments. Presentations that significantly run overtime will be halted and marked accordingly.

Students are required to assist with the evaluation of their colleagues' presentations and to participate in the question periods. Each students must submit, at least **5**, evaluations for their peer presentations. These evaluations must have your name, and the presenter's name, clearly printed to receive the five marks. All present in the audience will be asked to evaluate and grade each seminar. Only seminar scores provided by the faculty present will be used in determining the grade for the presentation. All evaluation forms will ultimately be returned to the student and his/her supervisor, and the supervisor will be expected to review these with the student as a means of providing feedback on the oral presentation.

Abstract of Research Project (BIOM*4521 only)

You must prepare a detailed abstract of your research project and provide one copy to your supervisor and one to the course coordinator by the due date. This should be a structured abstract, maximum 500 words, with the following headings:

Title
Introduction
Hypothesis & Objectives
Methods
Expected Results & Significance

The Methods section should be the largest component and will include details of the methodology and materials involved in the planned analysis, the number of experimental subjects, samples, etc., and details of planned statistical analysis. It is appropriate to discuss these components in detail with your advisor, but the written abstract should be in your own words.

The Final Written Report

The date given for the final written report (*Semester Deadlines*) is to be used as a guideline. The report should be submitted in duplicate for assessment by the supervisor and by a second senior reviewer not from their lab but delegated by the supervisor (electronic or paper submission? between supervisor and student).

Reports should be written in the format of a journal paper of the supervisors choosing, with the following sections: Title Page, Abstract, Key Words, Introduction, Materials and Methods, Results, Discussion, Conclusions, and References. The emphasis for BIOM*4510 and BIOM*4521 will be on the presentation and discussion of the research data generated during the semester; the final report for BIOM*4522 will be on the entire 2 semester's worth of work. The references for these reports should be in the format of the chosen journal.

It is appropriate for the supervisor to read a draft of the report once, and offer specific suggestions for improvement before the student submits the final version. This feedback is part of the learning process and students should schedule this preliminary reading with their supervisors well in advance of the due date of the report.

A CHECK-LIST FOR STUDENTS

1. Criteria for the supervisors assessment (the 20-30% component of the final grade) should be discussed and agreed upon at the first meeting with your supervisor.

2. When the semester begins, YOU are responsible for contacting your supervisor and proceeding according to his/her directions.

3. It is a good idea to arrange a time each week to meet with your supervisor to discuss your progress.

4. All seminars will be prepared using PowerPoint 2010 (see *The Seminar*). Assistance can be obtained from Kim Best, Rm 2633, OVC. Seminars must be brought to Kim for loading or e-mailed by 8:00a the morning of your presentation. If it's not there by that time you will lose 5 marks off your final average.

5. Preview your completed computer-generated presentation with your supervisor. Book a time(s) on the 'sign-up sheet' that will be posted on the seminar room several days before the practice times are scheduled.

6. You are expected to participate and to critique your colleagues' presentations (5 in total). Evaluation forms will be provided. Your name and the name of the presenter's must be clearly marked.

7. Complete a course evaluation on line at:
https://courseeval.uoguelph.ca/CEVAL_LOGIN.php

8. A preliminary draft of your report should be submitted to your supervisor for general comments and feedback before the final copy is submitted. Allow time for this to occur. Two copies of the final report are due to your supervisor on the specified day (see *Semester Deadlines* - use this date as a guideline).

9. Direct questions to the course coordinator, Dr Jim Petrik - ext 54921; Rm 3627, OVC; jpetrik@uoguelph.ca or Kim Best - ext 54918; Rm 2633, OVC; kbestb@uoguelph.ca.

A CHECK-LIST FOR SUPERVISORS

1. Read section on course objectives and goals. Students may do a laboratory research project double weighted in a single semester or double-weighted in each of 2 adjacent semesters.

2 In the initial meetings with your student, focus on opening up lines of communication because regular one-on-one meetings with a professor are likely to be a new experience. Students may feel intimidated and be reluctant to ask or respond to questions. Discuss your expectations of the student and be sure to clearly identify the criteria you will use in assessing the student's performance (e.g. the supervisor's assessment component of the overall evaluation).

3. Arrange regular meetings with the student to discuss progress, assign tasks or just have a short chat. Try to monitor the time that your student is spending on the course. The expectation is that these 1.0 credit courses should involve 15-24 hrs or student effort per week.

4. Discuss the questions posed on the *Seminar Questionnaire* that your students needs to return to the course coordinator before the specified deadline. Supervisors are expected to attend their student's oral presentation and to help evaluate other seminars in the time block selected.

5. If you are supervising a student enrolled in BIOM*4521, review a draft of the student's abstract, and provide a grade to the course coordinator no later than one week after the abstracts due date listed in each semesters' *Deadline Dates*.

6. If you have to be away from campus for a significant period of time, arrange for the supervision of your student in your absence.

7. Preview your student's presentation before seminar day on the computer in the seminar room. Practice times are scheduled during the week preceding the seminars. The emphasis should be on a clear development of ideas relating to their project.

8. Discuss the seminar evaluations with your student when they are returned to you.

9. Provide specific comments when your student asks you to review the preliminary draft of their final report.

10. Two copies of the student's final report are due in your hands by the specified deadline (see *Semester Deadlines* - use this date as a guideline). Find a senior colleague (not from your laboratory) to mark the second copy of the report. You will submit the two individual grades out of 100%. Also you must submit one mark out of 100% for your students overall performance, basically did the student meet all your expectations that you discussed at the beginning of the course?

11. Marks must be submitted to the course coordinator Dr. Jim Petrik or Kim Best by e-mail or hand delivered by 12:00noon on the specified deadline (tba) so that student grades can be compiled by the course coordinator for submission to the Registrar's Office.

12. Give marks out of 100%. We will calculate the final grade.

Direct any questions to: Dr. Jim Petrik ext. 54922; jpetrik@uoguelph.ca, or Kim Best ext. 54918; kbestb@uoguelph.ca.