

## **LITERATURE-BASED RESEARCH IN BIOMEDICAL SCIENCES** **BIOM\*4500**

### **Course Description and Requirements**

In the Department of Biomedical Sciences, a variety of research course formats are available (single-weighted and double-weighted over 1 or 2 semesters).

The Literature Review course is:

- (a) **BIOM\*4500** (single-weighted in 1 semester): - a literature review and research proposal (LR)

#### **Objectives**

The review course is 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 this courses is 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 (student's and/or published reports), (e) teach problem solving and (f) improve written and oral communications skills.

BIOM\*4500 is designed to give the student a realistic view of research by providing an opportunity for critical review of the literature.

#### **Faculty and Student Commitments**

Bio-Medical Science Majors may require both the single (BIOM\*4500) and one of the double-weighted courses (BIOM\*4510 // BIOM\*4521/2) for their programs. Thus, accepting a student may involve a commitment to 3 single course equivalents of research taken over 2 or 3 sequential semesters (depending on how the courses are arranged). The '0-6' and '0-12' h/week labels on the courses should be regarded as the minimum time commitment for students. In other courses, students are expect ed to work on course material after lectures and laboratories are finished. Research course students (particularly those doing 'hands-on' experimental projects) can expect that they will have to spent more like 12-20 h/wk and/or work irregular hours to complete their research work. Students may have to deliberately limit the time that they devote to these courses if they find the work particularly interesting or demanding. If a student feels that a problem is arising, he/she must talk to the supervisor about either becoming more efficient, or limiting the workload. Students should also feel free to talk to the course coordinator.

#### **Academic Misconduct**

The University of Guelph has adopted a set of policy guidelines to deal with academic misconduct. The University's view is that "academic misconduct is behaviour that erodes the basis of mutual trust on which scholarly exchanges commonly rest, undermines the University's exercise of its responsibility to evaluate students' academic achievements, or restricts the University's ability to accomplish its learning objectives." Never get yourself into a situation where you may be questioned about fabrication of research results and plagiarism because the University will deal severely with individuals who do these things. Make sure that you have the research results to support what you are writing about. It is under stood that different people may interpret the same research results differently. On the issue of plagiarism, avoid this by learning how to cite the work of other people properly (study research papers, talk to your supervisor). If possible, avoid making repeated references to a given paper.

## **Course Evaluation**

Two weeks before the end of the semester, students will be asked to complete a course evaluation - [https://courseeval.uoguelph.ca/CEVAL\\_LOGIN.php](https://courseeval.uoguelph.ca/CEVAL_LOGIN.php)

If you see ways that the course could be improved, please comment on the evaluation form. Your feedback is vital for us to assess the impact of the research courses and to fine-tune the way we operate. It will be used by the course coordinator to make improvements to the course .

## **Methods of Evaluation**

1. Formal Seminar Presentation - 30%
2. Evaluation of your colleagues' seminars (5 in total) - 5%
3. Final Written Report in the form of a literature review paper and research proposal - 40% (2 reviewers)
4. Assessment by the Supervisor\* - 25% for research projects and reviews.

\* The supervisor's assessment might include factors such as: interaction with others on the laboratory, organization of time, preparation for meetings, development of technical competence. 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 a oral presentation. This formal seminar will be presented using the 10/5 format commonly used in scientific meetings - a 10 minute presentation and a 5 minute question period. The emphasis in the presentation, and in the evaluation, should be on development of logical ideas and on effective communication utilizing MS Powerpoint 2010 only. Ideally, the seminar should include the following components:

- Introduction - general terms to orient the audience and provide background information.
- Objectives/Hypothesis - definition of the scope of the experimental project, or subject of the literature review
- Methodology/Experimental Design - provide an overview of the methods were used, database accessed or literature covered.
- Summary of Literature
- Discussion of Literature
- 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-mails (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) has 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, and you will be notified when this is available.

**\*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 morning(s) and/or afternoon(s) of these days. Every attempt being 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 these time restriction. Presentations will not be allowed to run overtime.

Students are required to assist with the evaluation of their colleagues' presentations and to participate in the question periods. Each student 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.

## **Details of Seminar Requirement**

Students are required to present one 10 minute seminar and answer questions from the audience for 5 minutes afterwards. By your seminar day, you should have a good understanding of the problem and what you aim to do to address it. You will have had time to read most of the relevant literature: you can introduce your subject and take your audience as far into the problem as your knowledge allows. The emphasis in the presentations and in the evaluations should be on development of logical ideas and on effective communication with appropriate audiovisual materials. The style of presentation is important for creating a good impression but you will want to avoid giving a theatrical performance without substance. Generally, the subject should be introduced without any audiovisuals by looking at audience and telling them in simple terms why you are interested in the subject and how it might relate to them: then, the problem can be defined with the aid of an outline of the entire project, indicating perhaps that you will only cover the first 1-3 or 4 points in your presentation. Your audience will know where you will be directing your efforts in the weeks ahead. You can then present the details regarding the first 1-4 points and conclude. This format applies to literature reviews and experimental projects. During the question period, students (and faculty) will receive critical feedback before they go too far. The departmental evaluation form will be marked by everyone present. Faculty should feel free to come and go during these seminars like in a typical scientific meeting.

You should realize now that 10 minutes is very little time to make a presentation but this is what is standard at scientific meetings. It is sometimes very difficult to sort out what to present because you have so much stuff! However, this is part of your training in this course. The worst thing that you could do to overcome the problem is talk fast and try to cram the information into the time available. A better approach is to:

1. Decide on a few opening lines using familiar words to introduce the subject (do not put outline up yet - look at audience). Why are you working on this topic? How does this relate to the audience or people in general?
2. Outline what you want to cover.
3. Cover it restricting yourself to 4 or 5 slides each with 5-6 lines maximum.
4. Conclude.

You have to introduce your topic well because the audience may not know anything about it. Relating the relevance of the work to you, the field or the Department gives the talk a context and helps people to become interested in what you say. If you are doing a review of literature, you can outline the full scope of the review indicating that you will only be covering the first 1-4 headings in your seminar. If you are presenting experimental findings, describe your idea and then your methods and results (if any): this an orderly approach that scientists can follow even if they are not familiar with your topic.

The short period allowed for each seminar has generally been handled well by the students. The main problem has involved developing the topics well but this comes back to focussing on the problem at hand rather than trying to give a crystal clear picture of the ‘universe’ in 10 minutes! The 10 minute format in regular meetings of various Societies forces scientists to be brief and to the point. The clarity comes from them thinking in the planning stages about the points they really want to make. Students also need practice to develop this skill.

The assessment forms will be scanned and returned to you, and your supervisor, shortly after the end of the presentations. Your supervisor should review your comments with you. The comments made on the evaluation forms may seem a little nit picky but our intention is to help students improve their communication skills. Take heed especially to common elements in the evaluations. Since there are usually fairly large differences between marks given by different faculty, we attempt to have each paper evaluated by at least 3 people. The average should be a reasonable indication of a student’s ability to communicate scientific information orally. Try to use the comments to improve your next presentation.

The faculty realize that these research project courses are the first exposure that students will have had to research. You are not expected to perform at the level of an MSc or PhD student. Having said this though, it is reasonable to expect students in the last semesters of the BSc degree to be able to speak clearly in front of people, to use neat visual materials and to organize their thoughts when they introduce their subjects and progress from literature through their hypotheses, methods, data and its interpretation to conclusions. Data and conclusions are not required in the seminars for this course - they have been scheduled too early for that.

Finally, you should take comfort from the fact that you and your supervisor probably know much more about your project than anyone else in the room.

### **The Final Written Report**

The date given for the final written report on the literature review (*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).

Literature review and research proposal (LR) reports should be arranged in a logical manner which allows development of the topic. The format is flexible but there should be a Title Page, Abstract, Key Words, Introduction, appropriate sub-headings, Summary and Conclusions, and References. The references for both types of report should be in the format of one of the principle journals consulted during your research project.

It is proper for the supervisor to read a draft of the project final report once, and offer specific suggestions for improvement before the student submits the final version. Graduate faculty provide advice to their graduate students when the latter are drafting MSc or PhD thesis. This feedback is part of the learning process and should be part of these research project courses experiences as well. 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 (25% component of the final grade) should be discussed and agreed upon at the first meeting with your supervisor.
2. When the semester begins, contact your supervisor and proceed according to his/her directions.
3. Arrange a time each week to meet with your supervisor to discuss your progress.
4. You need to discuss the points raised in the *Seminar Questionnaire*. This form needs to be returned to Kim Best, Room 2633 before the deadline date to facilitate planning the seminar days.
5. All seminars will be prepared using PowerPoint 2010 (see *The Seminar Preparation*). 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. (You will lose 5 marks off your final average if past the deadline.)
6. 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 door several days before the practice times are scheduled.
7. 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.
8. Complete the course evaluation on-line, during the last 2 weeks of classes, at [https://courseeval.uoguelph.ca/CEVAL\\_LOGIN.php](https://courseeval.uoguelph.ca/CEVAL_LOGIN.php).
9. A preliminary draft of your *Final Written 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 by the specified date given (see *Semester Deadlines* - use this date as a guideline).
10. Direct questions to the course coordinator Dr. Jim Petrik, ext 54921; Rm 3627 or Kim Best ext 54918; Rm 2633, Biomedical Sciences.

## A CHECK-LIST FOR SUPERVISORS

1. Read section on course objectives and goals. Students will do a literature review and research proposal (LR) Literature review in BIOM\*4500 only.
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 weekly meetings with the student to discuss progress, assign tasks or just have a short chat. Try to monitor regularly the time that your student is spending on the course.
4. Review basics of doing literature search by computer (OVC network) or by hand.
5. 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.
6. If you have to be away from campus for a significant period of time, arrange for your student to meet with a colleague at prearranged times. Contact can also be maintained by the email.
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 LR.
8. Discuss the seminar evaluations with your student when they are returned to you.
9. Be prepared to help your student meet your expectations if he/she is having to spent considerably more than 6 or 12h/wk on assigned tasks. We need to maintain a standard but the students also have to maintain other courses: help them with the balancing act
10. Provide guidance (re: prices of chemicals, disposables, etc.) for their budgets in the research proposal.
11. Provide specific comments when your student asks you to review the preliminary draft of the final report. (We help MSc and PhD students in such a way and should therefore provide written feedback to these research students.)
13. Two copies of the student's final report are due by the specified date given (see *Semester Deadlines* - use this date as a guideline). Find a senior colleague (not from your lab in order to provide independent objective assessment) to mark the second copy of the report. You will submit the two individual grades out of 100%.
14. Marks must be submitted to Dr. Jim Petrik or Kim Best by e-mail by 12:00p the specified deadline so that student grades can be compiled by the course coordinator for submission to the Registrar's Office.
16. Give marks out of 100%. We will calculate the final grade.

Direct any questions to: Dr. Jim Petrik ext. 54922; e-mail: [jpetrik@uoguelph.ca](mailto:jpetrik@uoguelph.ca), or Kim Best ext. 54918; [kbestb@uoguelph.ca](mailto:kbestb@uoguelph.ca).