BIOM*6900 Research Project in Biomedical Sciences

- This is a *mandatory* course for MBS students and essentially entails the research component of your program.
- This course is the only restricted graduate course in Biomedical Sciences – no MSC or PhD students may take this course.
- All course components *must* be completed to qualify to graduate from the course-based MSc (MBS) and forms the basis for the final degree grade.
- *Students will register for this course in semester 3* of the program, despite students initiating research and writing associated with this course as early as *semester 1*.
- A grade for BIOM*6900 is assigned based on marks in 4 components that are weighted as follows:
    - **30% - NSERC-style Discovery Grant (or similar) proposal**
        - In consultation with their Faculty Advisor, students will begin to develop research proposals structured in the form of an NSERC Discovery Grant application (or other funding agency applicable to the research project).
        - Instructions can be found on the NSERC website but students *will not* register the project online or submit the grant proposal to the NSERC website. The guidelines on the NSERC website are used as an example only.
        - This proposal is started as early as *semester 1* and it is expected that the draft proposal be submitted to the Advisory Committee for review by the *middle of the second month of semester 2.*
        - The proposal should be a minimum of 6 typed pages (single spaced) and the budget information is included at the discretion of the Faculty Advisor.
        - The final grant proposal is due for evaluation by the Advisory Committee no later than the *middle of the second month of semester 3*.
    - **15% - Poster Presentation**
        - Regardless of program start date, all students are required to present their research (or in some cases proposed research) in poster format at the annual Student Leadership & Research Program (SLRP) Presentation Days.
        - *SLRP is held in mid-August and attendance is mandatory.*
        - Students are encouraged to discuss their poster with their Advisory Committee.
        - Although every effort should be made to include original data in the poster, in some cases it may be necessary to focus on proposed work.
    - **40% - Research Paper**
        - Once the research project has been completed, students will be required to write their work up in the form of a research paper in a journal style agreed upon by the student and the Faculty Advisor.
        - By the *end of the third month of semester 3* the student is required to submit a draft of the research paper to the Advisory Committee. The

paper will then be reviewed with written critiques returned to the student.
- The student will then have the opportunity to revise the paper to address the review comments before resubmission of the final manuscript to the Advisory Committee for evaluation.
- The deadline for the final manuscript is the *middle of the second month of semester 3.*

- **15% - Advisor assessment of student performance**
  - This includes student effort within the laboratory, progression through the grant proposal process, and the poster presentation.

Table 1: Summary of due dates for research components associated with BIOM*6900.

Fall Start		Winter Start		Summer Start	
Month	Task	Month	Task	Month	Task
September		**January**		**May**	
October		**February**		**June**	
November		**March**		**July**	
December		**April**		**August**	*Poster Presentation
January		**May**		**September**	
February	**draft NSERC Grant (due mid-month)	**June**	**draft NSERC Grant (due mid-month)	**October**	**draft NSERC Grant (due mid-month)
March		**July**		**November**	
April		**August**	*Poster Presentation	**December**	
May		**September**		**January**	
June	**Final NSERC grant (due mid-month)	**October**	**Final NSERC grant (due mid-month)	**February**	**Final NSERC grant (due mid-month)
July	***Draft research paper (due mid-month)	**November**	***Draft research paper (due mid-month)	**March**	***Draft research paper (due mid-month)
August	*Poster Presentation Final Research Paper (due on the 12th)	**December**	***Final Research Paper (due on the 12th)	**April**	***Final Research Paper (due on the 12th)

* Poster Presentation – regardless of when a student starts the MBS program, a poster presentation is required in mid-August during the SLRP Presentation Days.
** The exact due date of the draft and final versions of the NSERC-style grant is determined by the Advisory Committee.
***The exact due date of the draft version of the research paper is determined by the Advisory Committee.

Research and research-related tasks:

- The research project will be designed so that it can reasonably be completed within 2-3 months of *full-time* lab work.
- As early as *semester 1*, students should conduct background research, discuss with their Faculty Advisor about receiving appropriate training for the proposed project, and begin research.
    - It is to the student's advantage to spend as much time in the lab as possible throughout the program in order to gain skills and become proficient in techniques necessary to complete the research project.
- Where applicable, students are required to prepare necessary ethical approval forms if human and/or animal ethical approval is required for the project. Even if the Faculty Advisor has already acquired ethical approval, students will still be required to prepare the necessary ethical approval forms.
- If applicable to the research project, students will also be required to take a portion of the Animal Care training course to ensure that they are able to handle live animals.
- The aim of completion of ethics forms and animal care training is to ensure that students know everything that is involved in setting up a research project.
- Students will be required to learn and demonstrate proficiency in the techniques that they will be using in their lab projects.
- It will not be necessary for students to publish their final paper in a scientific journal as factors related to the validity of the initial hypothesis, unexpected methodological difficulties, etc will often preclude development of a first-author paper in a total of only one or two semesters of work in the laboratory. However, the structure of the project will ensure that students are aware of the steps involved in conducting biomedical research; from the initial development of a research proposal, through the application for funding, preparation of results for publication, and writing up and submitting the results in the format of a scientific peer-reviewed journal manuscript.