Program Description:
The Master of Biomedical Sciences (MBS) program is a one-year course-based Masters program that involves coursework and a major research project (or literature review) or practicum placement. MBS students complete the degree under the supervision of a faculty advisor and advisory committee. Course selection and the topic of the research project (or practicum placement) are decided in consultation between the student and advisory committee.

There are multiple options to complete the MBS degree, and this is decided at the time when the student applies to the program.

(1) The standard MBS program involves the completion of 3.0 course credits plus the 1.0 credit course BIOM*6900 “Research Project in Biomedical Sciences” which is tied to the major research project. This major research project may be based on either a laboratory research project or a literature review project.

(2) The MBS program within the Applied Reproductive Biotechnologies stream has similar requirements to the standard program but involves a specific application process and mandatory Fall semester start. Students in this stream must complete a specific, prescribed set of graduate courses.

(3) The MBS program within the Applied Toxicology stream involves the completion of 3.0 course credits plus the 1.0 credit course BIOM*6910 “Practicum in Biomedical Sciences” which is tied with the one-semester practicum placement specific to this stream. The practicum is completed in lieu of the standard BIOM*6900 course and its related research project. This stream involves a specific application process and the completion of a prescribed set of graduate courses.

Degree Requirements:
- The MBS program requires a minimum of 3 semesters (12 months) of study.
- It is expected that students complete the program requirements by the end of the 3 semesters. Students who cannot finish by this time may be allowed to continue in the program if approval is granted by the advisory committee.
- Students are required to complete a minimum of 4.0 course credits. This includes 3.0 credits of typical classroom courses plus the mandatory 1.0-credit course BIOM*6900 (or BIOM*6910 if completing the Applied Toxicology stream). Students must register for BIOM*6900 or BIOM*6910 only during the third/final semester in the program. Please see the “Courses” section below.

Advisory Committee:
- The advisory committee must be established during the first semester of study.
- The advisory committee consists of the faculty advisor plus at least one additional graduate faculty member. The composition of the advisory committee is decided by the student and their faculty advisor.
- It is recommended that the student meets with the advisory committee once per semester.
**Forms:**
Students will submit two forms through the online GryphForms portal as early as possible. This must be complete during the student’s first semester in the MBS program.

1. The Advisory Committee Appointment GryphForm is available at this website: https://graduatestudies.uoguelph.ca/current/forms. This form may be found by selecting the red “Graduate Records Forms” button on this website. When completing this form, students should select ‘First Submission” and add the information for the faculty advisor and other member(s) of the advisory committee. Once the student submits this form, they will be prompted to complete the Degree Program GryphForm, which is the second form on this list.

2. The Degree Program GryphForm is available by selecting the red “Graduate Records Forms” button on the website above. Students should consult with their faculty advisor before completing this Degree Program GryphForm, because this is the place where they record the courses that they will complete in order to fulfill the MBS program requirements. These courses shall be listed in the section for Prescribed Courses and should equal to the 4.0 required credits (including BIOM*6900 or BIOM*6910). Any additional or optional courses that students may want to complete shall be listed under the Ancillary Courses section.

**Courses:**
- Students should select courses in consultation with their faculty advisor.
- Students may enroll in courses from the list of Graduate Courses in Biomedical Sciences or from any other department at the University of Guelph.
- In special circumstances, and with approval or the faculty advisor and course instructor, students may complete up to 1.0 course credits from 4th year undergraduate courses.
- Students must complete 4.0 course credits which includes 3.0 credits of typical classroom courses plus 1.0 credit of the mandatory BIOM*6900 or BIOM*6910. Details for BIOM*6900 are outlined below. Details for BIOM*6910 should be discussed with the faculty advisor for the Applied Toxicology MBS stream.
- In semester 1, students will be automatically registered in UNIV*7100 “Academic Integrity for Graduate Students”. There is no need to add this course on WebAdvisor. This is an online course and access to this course will begin on the first day of scheduled classes.
- For every semester, students must register for either UNIV*7510 “Active F/T Registration” or UNIV*7520 “Active P/T Registration”, depending on their full-time or part-time status.
- If there is a semester in which a student does not register for any courses, they should register for the placeholder course UNIV*7500 “Research/Writing”. The addition of this placeholder course ensures that the semester appears on the student’s transcript. Example situations may include the Summer semester for students who start the MBS program in the Winter or Summer semesters, if they are not taking any other courses.
- For students with Regular status, a course grade of 65% is required to pass an individual course and an overall grade average of B− (70%) is required to complete the program.
- For students with Provisional status, a course grade of 70% must be attained for each individual course and an overall grade average of 73% must be maintained.
BIOM*6900 “Research Project in Biomedical Sciences”

• This course provides academic credit for the research component of the MBS program.
• All course assignments must be completed before the end of semester 3, in order to complete this course and qualify to graduate from the MBS program (with the only exception noted in “Degree Requirements” above).
• Students must register for this course during semester 3 only, despite students initiating their MBS research project and associated written assignments as early as semester 1.
• The final grade for BIOM*6900 is assigned based on marks in the four course components as described below. Due dates are listed as recommendations for students and faculty advisors.
• Faculty advisors shall forward the marks for the four course components to the course coordinator before the end of semester 3.

Research Proposal (worth 30%)

• In consultation with their faculty advisor, students will develop a research proposal based on their actual research project. This proposal should be formatted based on the NSERC Discovery Grant application (regardless of Natural Sciences versus Health topics), or based on another funding agency that is applicable to the research project.
• Instructions may be found on the NSERC website but students will not register the proposal online or submit the proposal to the NSERC website. The guidelines on the NSERC website are used as an example only.
• Students may start work on the research proposal as early as semester 1 and it is expected that the draft proposal be submitted to the faculty advisor for review by the middle of the second month of semester 2. The faculty advisor shall provide feedback in a timely manner.
• The research proposal should be a maximum of 5 typed pages (single spaced) including figures and tables. Budget information may be included at the discretion of the faculty advisor. A reference list of up to two pages should also be included.
• The final research proposal should be submitted to all members of the advisory committee no later than the middle of the second month of semester 3. This assignment shall be marked by all members of the advisory committee.

Poster Presentation (worth 15%)

• Students are required to present their research in poster format. Students may present at a dedicated MBS student presentation session held on campus during mid-August, or, at an external scientific meeting. Students should consult with their faculty advisor to select their presentation venue.
• Students are encouraged to discuss the format and content of the poster with their advisory committee.
• Although every effort should be made to include original results in the poster, there may be some situations in which students will need to present proposed or preliminary work. Example situations include students starting in the Summer semester who have not yet been able to complete their full research project.
• This assignment shall be marked by all members of the advisory committee.

Final Research Paper (worth 40%)

• Once the laboratory-based or literature review-based research project is complete, students are required to write-up their work in the form of a research paper in a journal style agreed
Master of Biomedical Sciences (MBS) Program Outline

upon by the student and their faculty advisor.

- Students should submit a draft of the research paper to the faculty advisor for their review by the middle of the third month in semester 3. The faculty advisor shall provide feedback in a timely manner.
- Students will then have the opportunity to revise the final research paper to address the review feedback before submission of the final version to all members of the advisory committee no later than the 12th day of the fourth month of semester 3. This assignment shall be marked by all members of the advisory committee.

**Faculty Advisor Assessment of Student Performance (worth 15%)**

- The faculty advisor shall assign a mark based on factors including the student’s effort on their laboratory-based or literature review-based research project, progression through the research proposal process, and the poster presentation.

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

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<td>*poster presentation</td>
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<td>*<strong>final research paper (due on the 12th)</strong></td>
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* Poster Presentation: Regardless of when a student starts the MBS program, they may present at the dedicated mid-August MBS poster session or at another scientific meeting.

** Research Proposal: The exact due date of the draft and final versions of the research proposal may be determined by the advisory committee.

*** Final Research Paper: The exact due date of the draft and final version of the research paper may be determined by the advisory committee.
Research and Research-Related Tasks:
- The laboratory-based or literature review-based research project will be designed so that it can reasonably be completed within 2-3 months of full-time work. It should be noted that full-time work is not necessarily based on a 40 hour work week, but rather is reflective of the time commitment typically experienced by a Masters level student.
- Students may want to begin work on their research project as early as semester 1. This work may include conducting background research, receiving appropriate laboratory training and certifications, and performing the actual research.
- It is to the student’s advantage to spend as much time as possible in the laboratory or reading relevant literature throughout their MBS program, in order to gain skills and become proficient in techniques necessary to complete the research project.
- Where applicable, students may prepare necessary ethical approval forms if human and/or animal ethical approval is required for the research project.
- Where applicable, students may also be required to complete certain Animal Care training modules to ensure that they are able to use live animals in research.
- Students will be required to learn and demonstrate proficiency in the techniques that they will use for their research projects.
- It will not be necessary for students to publish their final research paper in a scientific journal, as factors related to the validity of the initial hypothesis, unexpected methodological difficulties, etc., will often preclude the development of a first-author paper in the time that MBS students are able to spend on their research project. However, the structure of the project will ensure that students are aware of the steps involved in conducting a laboratory-based or literature review-based research project in the biomedical sciences, from the initial development of a research proposal through the application for funding, preparation of results for publication, and writing and submitting the results in the format of a scientific peer-reviewed manuscript.

Transfer from the MBS program to the MSc program:
- Do you love your research and want to transfer from the course-based MBS program to the thesis-based MSc program? This may be possible, depending on several factors related to the student, advisor, and research project.
- If a student is interested in this transfer, they should consult with their faculty advisor as early as possible.
- The decision to transfer and the associated application for the internal program transfer must be submitted, with the assistance of the Graduate Program Assistant, no later than the middle of the third semester in the MBS program.
Please direct any questions to:

(1) For questions related to the academic aspects of the MBS program, including course selection, the research project / BIOM*6900, and interactions with the advisory committee:

Graduate Coordinator for the MBS program:
Dr. Craig Bailey
Office: OVC Biomedical Sciences Building (#40), Room 2602
Phone Extension: 54954
Email: baileyc@uoguelph.ca

(2) For questions related to the technical aspects of the MBS program, including forms and policies of the Department and University:

Graduate Program Assistant for Biomedical Sciences:
Heather Hamilton
Office: OVC Stewart Building (#45), Room 2509
Phone Extension: 54780
Email: bmsgrad@uoguelph.ca