Life Sciences 3L03
Laboratory Methods in Life Sciences

Note: This is a preliminary outline as of July 2017
Modifications to course content may vary slightly.

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COURSE DESCRIPTION:
In this inquiry-based laboratory course, we will utilize model organisms to investigate fundamental processes of human development. Specifically, students will utilize techniques in histology, cytology and genetics, and physiology to evaluate the changes that occur during our developmental timelines. We will also examine how environmental toxins can alter our developmental processes and lead to teratological or disease outcomes in a developing human.

COURSE AIMS:
In this course, students will have the opportunity to:
• Utilize model organisms to investigate processes of human development
• Combine multiple approaches in research methodologies to answer questions pertaining to human development
• Develop advanced skills in experimental design
• Gain proficiency in scientific data analysis
• Engage in the communication of research in the Life Sciences to multiple audiences

ONLINE CONTENT:
This course uses Avenue to Learn to post the course outline, assignments, and other notices. Go to http://avenue.mcmaster.ca to find out how to log-on to the course’s platform.

TEXTBOOK:
There is no required textbook for this course. Required readings will be provided for each lecture.
**SCHEDULE:**

- The course is divided into 4 modules (*listed below*).
- Every module will begin with a lecture on Wednesday (50 minutes) that will introduce the topic.
- Your two lab sections will be scheduled on Monday and Thursday or Tuesday and Friday. Each lab section is scheduled for 1 hour and 50 minutes.
- Note: Your lab scheduling is tied so that you are in the same lab as your group partners in each lab section.

**LifeSci 3L03 MODULES include a focus on human development in the following areas:**

- Histological studies of developing tissue - gametogenesis
- Physiology of developmental processes - respiration, cardiac activity and metabolic rates
- Cytology and genetics - chromosome analysis and markers for paternity testing
- Toxicology - impacts of heavy metals and toxins on development

**EVALUATION:**

- Each lab will be preceded by an online quiz that will prepare you for the lab techniques.
- Working in groups of four, you will maintain a collaborative online lab notebook into which you will collect, analyze, and summarize data and plan future experiments.
- There will be two practical tests that you will complete individually. These tests will cover both the lecture and lab material, and will especially allow you to demonstrate your laboratory and analytical skills.
- There will be two opportunities to prepare laboratory reports. One will be completed with your group at the start of the term and one will be completed on your own, to be submitted at the end of the course.
- There will be opportunities for reflection and discussion on laboratory activities.

**Evaluation Breakdown:**

- Online quizzes: 10 x 1% (=10% total) (*individual; weekly quiz covering pre-lab material*)
- Lab assignments: 5X 4% each =20%
- Group Lab Report 1: 10%
- Individual Lab Report 2: 15%
- Practical tests: 30% (*individual; 2 x 15% each*)
- Electronic Lab Notebook: 10%
- Guided Reflection: 5%

**PLEASE NOTE:** This is a preliminary course outline. The course schedule and all other course-related information will be released closer to the start of term.