

BIOL 301: Cell and Molecular Laboratory
Fall 2020 Course Plan* (*subject to change based on resource availability)

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Workload: 4 credits (Per week: 1h lecture – 6h laboratory – 5h out-of-class; or equivalent)

Prerequisites: BIOL 200, BIOL 201 (or ANAT 212/BIOC 212); or BIOL 219

Restriction: Not open to students who have taken or are taking BIOC 300, or BIOC 220 and BIOC 320. Requires departmental approval.

Content: An introduction to biology research and communication with a focus on cell and molecular biology. Through designing and conducting a series of project-based experiments, and writing a final report, molecular and synthetic biology techniques such as gene cloning, manipulation, protein isolation and characterization and how research is conducted, analyzed and communicated will be addressed. In addition, an introduction to bioinformatics methods and their role in analysis will be provided.

Research questions include:

- What is happening at the cellular/molecular level? What hypotheses can I generate based on preliminary data and reading of the literature?
- How can we investigate it? What techniques do we need to use?
- What samples do I use? How can I be confident that my experiment worked?
- What do my results mean?
- How does this compare to what is currently known/not known in the scientific literature?
- What do I need to do next to follow up on my results?

In BIOL 301 this fall we will give students an opportunity to answer these questions and communicate their results through a variety of activities. For example:

- Students will perform immersive, case study-based simulations to introduce them to experimental techniques
- Students will design experiments that will be carried out by lab staff and then analyze their “own” results
- Students will work on protocol development and/or trouble-shooting of experiments that have failed in the past
- And, students will work in mentored teams to do “choose your own adventure” case studies based on publicly available data and open science initiatives

Readings: The Laboratory Manual is essential and available online through *myCourses*. There is no assigned textbook, but texts used in BIOL 200 and 201 (for e.g. Lodish) are very useful and highly recommended. Selected articles are recommended in the Manual and in lectures and are available online through PubMed and McGill Libraries.

Evaluation: The grade for the course is based on assignments, laboratory quizzes, written proposal and laboratory reports, and a final presentation.

Enrolment in this course is limited. Departmental approval for both sessions of BIOL 301 must be obtained from the Biology Department by e-mailing anne-marie.sdicu@mcgill.ca prior to registering in Minerva. Be sure to include in that email your student I.D. number, the semester and two choices of lab day.