

## Department of Biology Course Outline

### SC/BIOL 2070 3.0 Research Methods in Cell and Molecular Biology Winter 2018

#### Course Description

The course focuses on laboratory techniques in the life sciences. Practical research skills are developed through experiential learning (via integrated and relevant laboratory techniques). Research skills include scientific writing, data analysis/interpretation, experimental design and hypothesis testing. Practical experience with current techniques in cellular/molecular biology is gained in the laboratory. One online lecture hour\* and six laboratory/practical hours **per week**. One term. Three credits. (\*Lectures are provided using multimedia formats.)

#### Prerequisites

SC/BIOL 1010 6.0 or SC/BIOL 1000 3.0 and SC/BIOL 1001 3.0; SC/CHEM 1000 3.00 and SC/CHEM 1001 3.00.

#### Course Instructors and Contact Information

**Course Director:** Dr. Vivian Saridakis

**TA Coordinator:** TBA

**Course Website:** <https://moodle.yorku.ca>

**Course Email:** [biol2070@yorku.ca](mailto:biol2070@yorku.ca)

#### Schedule

One e-learning lecture hour per week.  
Six laboratory/practical hours per week.  
Lab Schedule: Please consult the university online course information site as well as the laboratory schedule found on the course Moodle site.

#### Evaluation

The course is organized into an orientation followed by four modules.

Module 1: Scientific Writing (Dry lab)	20%
Module 2: Genetics (Wet lab)	20%
Module 3: Biochemistry (Wet lab)	20%
Module 4: Cell Biology (Wet lab)	20%
Final Exam:	20%

## Important Dates

FINAL EXAM: Dates/times/rooms for exams are scheduled and published by the Registrar's Office  
Last Day to drop the course without receiving a grade: <https://registrar.yorku.ca/enrol/dates/fw18>  
Last Day to withdraw from the course and receive "W": <https://registrar.yorku.ca/enrol/dates/fw18>  
NOTE: for additional information on withdrawing from a course refer to <http://secretariatpolicies.info.yorku.ca/policies/withdrawn-from-course-w-policy-and-guidelines/>  
NOTE: for additional important dates such as holidays, refer to the "Important Dates" section of the Registrar's Website at <http://www.yorku.ca/yorkweb/cs.htm>

## Resources

- BIOL2070 Resource Manual (available in the bookstore)
- Hard cover lab notebook with numbered pages.
- Reed et al. (2016) Practical Skills in Biomolecular Sciences, 5<sup>th</sup> ed. Pearson Education.
- Moodle website <https://moodle.yorku.ca>
- Highly Recommended: McMillan, V.E. (2012) Writing Papers in the Biological Sciences. Bedford Books

## Learning Outcomes

- Experimental design and hypothesis testing;
- Data interpretation, including standard curve interpolation (graphing) and determining molecular weight of an unknown protein or genotype;
- Critical thinking and assessment of current scientific publications;
- Scientific writing of results and data analysis;
- Use of model organism(s);
- Genetic engineering in microorganisms (e.g., bacteria, yeast);
- DNA analysis, including DNA extraction, use of restriction enzymes, polymerase chain reaction and gel electrophoresis;
- Identification of genetic inheritance patterns based on genotype and phenotype including sex-linked traits;
- Bright field, phase contrast and fluorescence microscopy, and identification of cellular components.
- Spectrophotometry, chromatography and enzymatic assays;
- Making dilutions and buffers;
- Protein analysis via SDS-PAGE

## Course Content

### **Course Organization**

The course is organized into an orientation followed by four modules. Students rotate through the different modules, which are held in different rooms in the Life Science Building (LSB). Different lab sections follow a different order of modules. Each module has 5 lab days.

### **Modules**

Module 1: Scientific Writing (TBA)

Module 2: Genetics (wet) in Life Sciences Building (LSB) 221

Module 3: Cell Biology (wet) in Life Sciences Building (LSB) 223

Module 4: Biochemistry (wet) in Life Sciences Building (LSB) 225

## Experiential Education and E-Learning

### **Experiential Education**

- Laboratory work

### **E-Learning**

- Moodle Website
- Online quizzes
- Supplemental videos and presentations for laboratories

## Other Information

- Laboratories Start on January 10<sup>th</sup> 2018 for Monday and Wednesday Classes
- Laboratories Start on January 11<sup>th</sup> 2018 for Tuesday and Thursday Classes
- The last day to make permanent lab switches is Thursday January 11<sup>th</sup> 2018.

## Course Policies

### **Laboratory coat and safety goggles (available at York Bookstore)**

• You must bring a laboratory coat and safety goggles to each wet lab including the orientation (these are labs that occur in LSB 221, 2223 and 225). If you lack one or more of these items you will not be permitted to remain in the labs and no makeup will be granted.

### **Email Policies and etiquette**

We will try to respond to email (biol2070@yorku.ca) within two working days, but this is not always possible.

In order to ensure a prompt answer please follow the following guidelines.

Email messages not meeting these guidelines may not be answered.

- Use your @my.yorku.ca email address when emailing instructors and others within the university. Email from other sources may be filtered out and not reach the intended recipient.
- SUBJECT LINE - Include the course code, lab section and brief indication of topic.

Lab email example: BIOL2070 lab4 – missed lab because of illness.

- The lab group is critical to ensure the appropriate TA and instructor receive your message.
- Include your NAME and STUDENT NUMBER at the end of each email. We work with hundreds of students and the only way we can access your course information is via your student number.
- Remember, you are in a professional environment and thus all your written correspondence, including emails, should be professional. This means full sentences, proper grammar, NO text message lingo. Please begin your message appropriately: “Dear Professor XXXX” not “Hey!”. Or use “To whom it may concern”.
- Before emailing the instructor or TA, consider the nature of your question and whether another resource should be consulted first. For example, most of the information you need is in this outline or posted on the course website.

### **Academic Honesty and Integrity**

York students are required to maintain the highest standards of academic honesty and they are subject to the Senate Policy on Academic Honesty (<http://secretariat-policies.info.yorku.ca/policies/academic-honesty-senate-policy-on/>). The Policy affirms the responsibility of faculty members to foster acceptable standards of academic conduct and of the student to abide by such standards.

There is also an academic integrity website with comprehensive information about academic honesty and how to find resources at York to help improve students' research and writing skills, and cope with University life. Students are expected to review the materials on the Academic Integrity website at - <http://www.yorku.ca/academicintegrity/>

### **Access/Disability**

York University is committed to principles of respect, inclusion and equality of all persons with disabilities across campus. The University provides services for students with disabilities (including physical, medical, learning and psychiatric disabilities) needing accommodation related to teaching and evaluation methods/materials. These services are made available to students in all Faculties and programs at York University.

Students in need of these services are asked to register with disability services as early as possible to ensure that appropriate academic accommodation can be provided with advance notice. You are encouraged to schedule a time early in the term to meet with each professor to discuss your accommodation needs. Please note that registering with disabilities services and discussing your needs with your professors is necessary to avoid any impediment to receiving the necessary academic accommodations to meet your needs.

Additional information is available at the following websites:

Counselling & Disability Services - <http://cds.info.yorku.ca/>

Counselling & Disability Services at Glendon - <http://www.glendon.yorku.ca/counselling/personal.html>

York Accessibility Hub - <http://accessibilityhub.info.yorku.ca/>

### **Ethics Review Process**

York students are subject to the York University *Policy for the Ethics Review Process for Research Involving Human Participants*. In particular, students proposing to undertake research involving human participants (e.g., interviewing the director of a company or government agency, having students complete a questionnaire, etc.) are required to submit an *Application for Ethical Approval of Research Involving Human Participants* at least one month before you plan to begin the research. If you are in doubt as to whether this requirement applies to you, contact your Course Director immediately.

### **Religious Observance Accommodation**

York University is committed to respecting the religious beliefs and practices of all members of the community, and making accommodations for observances of special significance to adherents. Should any of the dates specified in this syllabus for an in-class test or examination pose such a conflict for you, contact the Course Director within the first three weeks of class. Similarly, should an assignment to be completed in a lab, practicum placement, workshop, etc., scheduled later in the term pose such a conflict, contact the Course director immediately. Please note that to arrange an alternative date or time for an examination scheduled in the formal examination periods (December and April/May), students must complete an Examination Accommodation Form, which can be obtained from Student Client Services, Student Services Centre or online at [http://www.registrar.yorku.ca/pdf/exam\\_accommodation.pdf](http://www.registrar.yorku.ca/pdf/exam_accommodation.pdf) (PDF)

### **Student Conduct in Academic Situations**

Students and instructors are expected to maintain a professional relationship characterized by courtesy and mutual respect. Moreover, it is the responsibility of the instructor to maintain an appropriate academic atmosphere in the classroom and other academic settings, and the responsibility of the student to cooperate in that endeavour. Further, the instructor is the best person to decide, in the first instance, whether such an atmosphere is present in the class. The policy and procedures governing disruptive and/or harassing behaviour by students in academic situations is available at - <http://secretariat-policies.info.yorku.ca/policies/disruptive-andor-harassing-behaviour-in-academic-situations-senate-policy/>