

## Department of Biology Course Outline

SC/BIOL 4290 4.00 Biotechnology  
Winter 2020

### Course Description

This laboratory course covers some of the methods currently in use in biotechnology research in industry and academia. Emphasis is placed on methods for transforming eukaryotes with marker genes. Advanced methods used in molecular biology are also covered. Two lecture hours, six laboratory hours. One term. Four credits. Prerequisite: SC/BIOL 3110 3.00 or SC/BCHM 3110 3.00.

### Prerequisites

SC/BIOL 3110 3.0 or SC/BCHM 3110 3.0

### Course Instructors and Contact Information

Dr. Katalin Hudak  
A304 Farquharson Bldg.  
hudak@yorku.ca  
Phone: 736-2100 x33470  
OFFICE HOURS: Please e-mail hudak@yorku.ca to make an appointment.

### Schedule

Monday 11:30am – 1:30pm  
Life Science Bldg 107

### Evaluation

PRESENTATION (20%)  
PARTICIPATION (10%)  
LAB REPORTS (35%)  
LAB QUIZ (10%)  
FINAL EXAM (25%)

Detailed information for Grading can be found under 'Course Content'

### Important Dates

For 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

No Required Textbook.

**Course Moodle:** Powerpoint slides of lectures will be posted on Moodle prior to lecture. Student papers and presentations will also be posted on Moodle.

## Learning Outcomes

- Knowledge and understanding of biotechnology topics and applications
- Critical evaluation of primary literature
- The ability to carry out challenging lab experiments; to collect and analyse data, to trouble-shoot, to write full-length lab reports
- To work in pairs in the lab
- To verbally present primary literature and field questions from the class

## Course Content

### LECTURE TOPICS:

Agricultural Biotechnology (GM foods, extricating foreign genes)

Industrial and Environmental Biotechnology (Biocatalysis, novel compounds, bioremediation)

Medical Biotechnology (Cloning, stem cells, gene therapy)

### GRADING FOR TERM

#### PRESENTATION (20%)

You will be expected to give a very concise and well organized oral presentation on a subject that is related to this biotechnology course. Based on your choice of a single recently published paper (choice must be approved by course director from provided list), give a 10 minute presentation on the paper, followed by 5 minutes for questions. Your answers to class questions will be used to evaluate your background knowledge and understanding of the work (methods used, potential applications, ethical issues).

#### PARTICIPATION (10%)

This grade will be based on your participation in both the laboratory exercises and the presentations. This means you have to ask questions in both environments!

Your participation in the oral presentations; i.e., your attendance and questions asked during the discussions will be assessed by the course director.

The lab performance grade is based on your laboratory technique, how well prepared you are for the lab, your lab cleanup, your attitude in the lab, your cooperation with your lab partner and on your laboratory notebook (which will be reviewed periodically by the teaching assistants). The grade for lab performance is determined by all of those involved in running the lab: the course director, the teaching assistants and the lab technician.

#### LAB REPORTS (35%)

Laboratory 1, PLANT BASED – Transient transformation and Immunocytochemistry 10%

Laboratory 3, MAMMALIAN CELL BASED - Immunoprecipitation of Activated MAP Kinase 10%

Laboratory 4, MICROBE AND IN VITRO BASED - Protein Expression and Purification, In Vitro Transcription and Translation 15%

#### LAB QUIZ (10%)

Laboratory 2, YEAST BASED – Genome editing with CRISPR-Cas9 10%

#### FINAL EXAM (25%)

This exam will be based on the lecture material and fellow student presentations, and will be held during the normal exam period.

## Course Policies

### LATE REPORTS AND MISSED TESTS:

Late lab reports will be penalized 10% each day. Absence from a lab or the lab quiz must be accompanied by a completed Attending Physician's Statement clearly stating why the lab/quiz was missed, within one week of the missed session. The grade value of the quiz will be added to the final exam. Missed final exams must be accompanied by a petition to write a deferred exam: "Academic Petition Form" (<http://science.yorku.ca/current-students/procedures/petitions/how-to-file-a-petition>) and other required documents.

## University Policies

### 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/>

### 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 and submit an Examination Accommodation Form at least 3 weeks before the exam period begins. The form can be obtained from Student Client Services, Student Services Centre or online at <https://secure.students.yorku.ca/pdf/religious-accommodation-agreement-final-examinations.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/>