College of Biological Science
Molecular and Cellular Biology

COURSE OUTLINE
BIOT*6500 Molecular Biotechnology [0.50]

This course will provide an overview of molecular approaches relevant to a broad range of biotechnology industries including those found in medical, microbial, protein, pharmaceutical, environmental and agricultural fields. The material covered will involve an analysis of the main molecular techniques required for the biotechnology industries. These include but are not limited to: methods to produce proteins of economic interest in a variety of systems; the ability to modulate important traits through genetic change in important crop species; the ability to detect microorganisms in the environment; methods to detect gene variants for human health; and issues around bioprocessing and fermentation. The emphasis will be on the current approaches in each of these areas using the published literature and how these are being used in the biotechnology industry.

BIOT*6500 consists of three modules that will combine lecture-based theoretical content with hands-on practical training. Students are evaluated on their performance in journal clubs, individual reports and group presentations (**see guidelines**). The curriculum for Fall2016 is as follows.

Lectures:
Lectures are in room SSC3317 on Monday mornings, 9:30AM-12:30PM
All material covered in lectures and the assigned readings are the responsibility of the student.

Instructors
Dr. Scott Ryan
SSC Room 3456

Dr. Tariq Akhtar
SSC Room 4461

II) Specific Learning Outcomes

By the end of the course, successful students will:
1. Demonstrate advanced critical analysis of current research literature in molecular biosciences to identify the best approaches for a specific applied research goal

2. Demonstrate a high degree of literacy in written reports

3. Understand the global context in which molecular biotechnology operates by identifying molecular applications that are globally competitive

4. Communicate clearly and persuasively, their analyses and conclusions, in both written and oral form

III) Course Structure

Module 1 - Applications in Biotechnology
Topics: Omics and applications, Metabolite Profile in Agriculture, Medicinal Plant Metabolomics

Module 2 - Tools in Biotechnology 1
Topics: DNA Technology, Chromatography Technology, Mass Spectrometry

Module 3 - Biotechnology and the life science industry
Topics: Modeling Human Disease - Animals vs Cells, Modeling Human Disease- Issue in Biotechnology, High throughput screening for pre-clinical drug development

Module 4 - Tools in Biotechnology 2
Topics: DNA Technology, Imaging Technology, Screening Technology

Tentative Schedule

Week	Date	Lecture Topic
1	Sept. 11	Genomics and applications - Akhtar
2	Sept. 18	Student presentations
3	Sept. 25	Proteomics - Akhtar
4	Oct. 2	Student presentations
5	Oct. 9	No Class – Thanksgiving (Module 1 Report Due)
6	Oct. 16	Metabolomics (Module 2 Report Due)
7	Oct. 23	Modeling Human Disease - Ryan
8	Oct. 30	Student presentations
9	Nov. 6	High throughput screening - Ryan
10	Nov. 13	Student presentations
11	Nov. 20	Student presentations (Module 4 Report Due)

IV) Methods of Assessment

Assessment	% of final grade	Date	Course activity	Learning outcomes assessed
Class presentations Module 1&3	2 x 25%	schedule to be provided	Presentations	1-4
Class participation	10%		Submitted questions	1-4
Written Data Reports Modules 1 & 2	2 x10%		*In silico* Data Analysis	1-5
Written Data Report Module 4	20%		AAC-Imaging	1-5

V) Course and University Policies

When You Cannot Meet a Course Requirement

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons, please advise the course instructor in writing, with your name, id#, and e-mail contact, and be prepared to provide supporting documentation. See the undergraduate calendar for information on regulations and procedures for Academic Consideration:
http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml

The nature of the consideration will depend on the specific circumstances but a likely outcome would be to have the final exam reweighted to include the value of the missed assessment.

Accessibility

The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability or a short-term disability should contact the Centre for Students with Disabilities (soon to be renamed Student Accessibility Services) as soon as possible.
For more information, contact CSD at 519-824-4120 ext. 56208 or email csd@uoguelph.ca or see the website: http://www.csd.uoguelph.ca/csd/

Academic Misconduct

The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community – faculty, staff, and students – to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.
Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.
The Academic Misconduct Policy is detailed in the Undergraduate Calendar:
http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml

E-mail Communication

As per university regulations, all students are required to check their <mail.uoguelph.ca> e-mail account regularly: e-mail is the official route of communication between the University and its students. Course instructors are not obliged to answer course-related emails from students that do not originate from official university student email accounts.

Drop Date
The last date to drop one-semester courses this fall, without academic penalty, is November 3, 2017 (the 40th class day). For regulations and procedures for Dropping Courses, see the Undergraduate Calendar:
http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml

Copies of out-of-class assignments
Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

Recording of Materials
Presentations which are made in relation to course work—including lectures—cannot be recorded or copied without the permission of the presenter, whether the instructor, a classmate or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

Grading
Missed lecture or laboratory material as a result of absence is your responsibility. Grades will be assigned according to the standards outlined in the University of Guelph Undergraduate Calendar.

Campus Resources
The Academic Calendar is the source of information about the University of Guelph's procedures, policies and regulations which apply to undergraduate, graduate and diploma programs:
http://www.uoguelph.ca/registrar/calendars/index.cfm?index

If you are concerned about any aspect of your academic program:
make an appointment with a program counsellor in your degree program.
http://www.bsc.uoguelph.ca/index.shtml or
https://www.uoguelph.ca/uaic/programcounsellors

- If you are struggling to succeed academically:
There are numerous academic resources offered by the Learning Commons including, Supported Learning Groups for a variety of courses, workshops related to time management, taking multiple choice exams, and general study skills. You can also set up individualized appointments with a learning specialist.
http://www.learningcommons.uoguelph.ca/

- If you are struggling with personal or health issues:
Counselling services offers individualized appointments to help students work through personal struggles that may be impacting their academic performance.
https://www.uoguelph.ca/counselling/
Student Health Services is located on campus and is available to provide medical attention. https://www.uoguelph.ca/studenthealthservices/clinic
For support related to stress and anxiety, besides Health Services and Counselling Services, Kathy Somers runs training workshops and one-on-one sessions related to stress management and high performance situations.
http://www.uoguelph.ca/~ksomers/

- If you have a documented disability or think you may have a disability:

The Centre for Students with Disabilities (CSD) can provide services and support for students with a documented learning or physical disability. They can also provide information about how to be tested for a learning disability. For more information, including how to register with the centre please see: https://www.uoguelph.ca/csd/