

Department of Biology Course Outline

BIOL 4030, Proteomics
Winter, 2016

Course Description

Contemporary proteomic methodologies and applications. Specific topics: high-throughput methods, protein identification, protein complexes, structural proteomics, sub-cellular proteomics and molecular modeling.

Prerequisites

SC/BIOL 3130 3.00

Course Instructors and Contact Information

Logan Donaldson / Professor
323B Life Sciences Building
logand@yorku.ca

Office hours are by appointment only

Schedule

Monday and Wednesday classes, 5:30-7:00 , CB 129
No tutorial or laboratory

Evaluation

- in class exam on aspects of protein structure (10%)
- in class exam on proteomics strategies (10%)
- in class exam on selection methods (10%)
- fold-it computer modeling task (10%)
- PyMOL modeling task (10%)
- comprehensive final exam (50%)

Important Dates

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

All material (software, notes and readings) are provided
There is no textbook

Learning Outcomes

Upon successful completion of this course, students should be able to:

- describe what the field of proteomics is and how it contributes to our understanding of biology
- understand the basic elements of protein structure and be able to describe proteins visually with modern software
- compare proteins at various levels (primary, secondary, tertiary structure) and understand what current research is doing to solve the structure of proteins from first principles
- understand the use of combinatorial libraries and how they advance high throughput applications
- improve their knowledge of programming through the use of a scripting language

Course Content

This fourth year course, over the past five years, has evolved from covering high throughput methods of protein detection to an introduction to proteomics followed by contemporary aspects of protein structure and design. The shift in curriculum has been in response to a need for more intermediate/advanced biochemistry in the upper levels and to provide some exposure to bioinformatics.

Unit 1 - contemporary proteomics approaches and systems biology

Unit 2 - combinatorial and peptide libraries

Unit 3 - protein structure and structural proteomics

Unit 4 - comparing and classifying proteins

Unit 5 - protein design

Experiential Education and E-Learning

Hands on molecular modeling with PyMOL graphics software
Hands on aspects of protein structure with FoldIt software

Other Information

Please consult the website and blog regularly at www.yorku.ca/biol4030

Course Policies

Missed exam weighting may or may not be transferred to the final exam depending on the circumstances.

Late assignments will incur a penalty of 25% per day

Lectures may be recorded, although a blog is provided for a course synopsis

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/>

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 (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/>