**CSB 474H1S – METHODS IN GENOMICS AND PROTEOMICS**

48P

**This course has a lab fee of $50.**

**Lab coat is required and the approximate cost is $16. Students are responsible for purchasing this.**

NOTE: This is a balloted course. You must apply to the Department of Cell and Systems Biology for entry. Go to [**http://www.csb.utoronto.ca/undergraduate/forms**](http://www.csb.utoronto.ca/undergraduate/forms) for a ballot form.

**Lecturer:**

TBA

**Prerequisites:** BIO260H1/HMB265H1, BIO255H1/CSB330H1/350H1 or permission of instructor

Students who have not taken BIO255H1/CSB330H1/350H1 will be considered for entry into the course if they have done well in BIO230H1/BIO240H1/BIO241H1 or CSB352H1

**Recommended Preparation:** BCH311H1/CSB349H1/MGY311Y1

Genomics and proteomics have revolutionized biological research. It is now theoretically possible to fully characterize the structure, organization, regulation and interaction of all genes, proteins and small bioactive molecules in an organism. CSB 474H1 is an intensive and rigorous laboratory course that will teach students how to produce and analyze data that are central to the fields of genomics and proteomics. The course is divided into three modules, the first of which focuses on genomics, the second on transcriptomics, and the third on proteomics. Each module begins with at least two wet labs where students generate data and end with computer labs where students analyze the data. In this way students will learn how to conduct an experiment from beginning to end. Techniques taught include DNA and RNA extraction, shotgun library construction, PCR, DNA sequencing, expression profiling, 2D-gel proteome analysis, mass spectrometry and associated bioinformatics analyses such as sequence analysis and assembly, and statistical analysis of expression data and mass spectrometry data. This is an advanced laboratory and computer-based course, and assumes a strong background in molecular genetics and some prior laboratory experience. It is most appropriate for students wishing to pursue careers involving biological research.

**Required Text:** No required textbook. Information will be provided through lectures presented in the first wet lab and first computer lab of each module and posted articles.

**Evaluation:** Three quizzes (15%), three lab reports (60%), lab performance (25%). Graduate students have an additional grant proposal (20%).