

ICS 491 Fall 2005

INTRODUCTION TO BIOINFORMATICS: Genome and sequence analysis

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Class hours: Tuesday-Thursday 13:30 pm to 14:45 pm

Location: KUY 304

Professor Guylaine Poisson, guylaine@hawaii.edu

Office Hours: Tuesday-Thursday 15:00 to 16:30 or by appointment.

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Textbook: Online resources will be posted on the course website

A list of reference books, research publications and recommended reading will also be posted on the course website.

This is an introductory course, no knowledge of biology or bioinformatics is assumed. Basic knowledge of programming is desirable. This class will focus on the basic knowledge of bioinformatics in the sequence analysis problem. Next semester another class will focus on the structure analysis and other problems related to the analysis of biological sequences.

Auditors and students from other departments are welcome.

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The course is divided in five sections. In each one we will combine the molecular biology knowledge needed to understand the problems with looking at some algorithms and learning how to use them.

Section 1: Biological sequences: Molecular biology for computer scientist, Types of sequences, biological database on internet. Informatics problems related to sequencing, assembly techniques etc.

Section 2: Sequences comparison: Sequences comparison techniques. Sequences alignment (pair and multiple). Global and local comparison.

Section 3: Patterns in sequences : Techniques of prediction and classification for pattern recognition in sequences.

Section 4: Genome structure : Procarya and eukarya genomes. Gene prediction and annotation.

Section 5: Microarrays Data: Basic knowledge of the microarrays technology and their applications to biology. Analysis: clustering, classification, time-series etc

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Tentative: 5 assignments (for 40%), 2 exams (60%).