

Comp 790-087: Computational Genetics

Bulletin Description

Comp 790: Topics in Computer Science is a graduate seminar. The course has variable content and may be taken multiple times for credit.

General Course Info

Term: Spring 2014
Department: COMP
Course Number: 790
Section Number: 087
Time: MW, 1:00 – 2:15
Location: SN 011
Website:

www.csbio.unc.edu/mcmillan/index.py?run=Courses.Comp790S14

Instructor Info

Name: Prof. Leonard McMillan
Office: SN 311
Email: mcmillan@cs.unc.edu
Phone: 919-590-6078
Web: <http://www.cs.unc.edu/~mcmillan>
Office Hours: Tuesdays, 3:00 – 4:30pm, or by appointment

Teaching Assistants

None

Textbooks and Resources

The course will be taught using lecture notes and assigned readings of recent publications.

Course Description

The Spring 2014 offering of Comp 790-087 will explore the latest advances in genetics and genomics with a focus on developing computational modeling and analysis tools. It will cover microarray and high-throughput sequence data analysis, as well as develop theoretical models suitable for prediction including population structure, the coalescent theory, selection, evolution, recombination, phasing, and genome mapping. The course will be both hands on (in-class programming exercises) and project oriented (with both group and individual projects).

Target Audience

The audience for 790-087 is graduate students interested in pursuing research topics in computational biology or bioinformatics.

Prerequisites

Comp 555: Bioalgorithms is highly recommended but not required. All students are expected to be proficient in programming.

Goals and Key Learning Objectives

1. To introduce students to current open problems in genetics and genomics.
2. To develop critical reading skills of recent publications from multidisciplinary research areas.
3. Identify areas where collaborations between computational and biological scientists can advance both fields.
4. Insights into using a computer to develop models and analyze of biological information systems.
5. To develop a small to medium scale research project suitable for publication.

Course Requirements

Students taking Comp 790 will be required to read and present two recent research papers, take part in a group project to develop shared-code infrastructure, and complete a final research project with a write up in the style of a research paper submission.

Key Dates

There will be no mid-term or final exam. By the second week of classes a schedule for student paper and proposal presentations will be established.

Grading Criteria

20 %	-	Research paper presentations
20 %	-	Project proposal presentation
50 %	-	Final Project write up
10 %	-	Course participation

Course Policies

Class attendance is expected. Multiple absences will be reflected in the class participation component of the course grade.

Honor Code

Students are encouraged to collaborate, but final projects are expected to reflect the research efforts of an individual student.

Course Schedule

A detailed schedule of topics and presentations will be posted on the course web site after the second week of class.

Disclaimer

“The professor reserves the right to make changes to the syllabus, including project due dates and test dates. These changes will be announced as early as possible.”