

GBS 746 - Special Topic (Introduction to Scientific Computing)

Purpose:

The purpose of this course is to provide an introduction to main computational skills required for scientific computing. Specifically, the participants are exposed to practical use of standard web available resources and computational tools for the managing molecular biology data. A successful participation includes the development of scripts and programs for analyzing large-scale data. 1.00 Credit hours

Instructor: Malay K. Basu PhD and Emidio Capriotti, PhD

Levels: Graduate

Schedule Types: Lecture

Type: Class

Time: 10:00 a.m. – 1:00 p.m.

Days: Mondays, Tuesdays, Thursdays and Fridays

Where: West Pavilion Conference Center, Room G.

Date Range: February 15, through March 2, 2014

Graduate Biomedical Sciences (GBS) Program

Course Attributes:

Tuition Joint Health Science

Rationale and history:

Nowadays we are in the Big Data era. This is characterized by the collection of a huge amount of data so large and complex that it becomes difficult to process using on-hand database management tools or traditional data processing applications. In the near future, the main challenges will include, curation, storage, search, sharing, analysis, and visualization of these data. This exponential trend to a larger set of data is evident in biomedical sciences where cheaper high-throughput sequencing techniques are providing a huge amount of biomolecular data and connection between worldwide health institutions can provide access to a large set of medical data through the EMRs. According to this scenario, future researchers in biomedical science will need to deal with a large amount of data to deliver high quality research. To bridge the gap between experimental and *in silico* investigators in biomedical sciences, we introduce this course particularly designed for people with a low level of expertise in informatics that would like to learn basic scientific computing skills to improve their research.

Organization:

This course is organized as a hands-on training for graduate students, faculty and computational staff. A limited number of slots are made available for Pathology residents, fellows and graduate students with interests in learning basic computing skills for research purpose. The first part of the course will be dedicated to the installation/configuration of Linux operating system. The attendees will become familiar with the most important command lines in UNIX shell. In the second part of the course, students will learn about a scripting language (Python and/or Perl) understanding the basic data structure types and built-in functions available for them. In the final part of the course, an introduction to the R Project for Statistical Computing will be provided to perform basic statistical analysis.

Further details and information about the course and the lectures will be made available at <http://cmb.path.uab.edu/training>.

Evaluation:

Evaluation is based on class participation and project development. The attendees are required to present the implemented scripts and programs at the end of the course.

Additional Information:

- Cap class at 20 students
- Lecture Course
- Interview with course master before accepted in class
- Grading: letter grade
- Cross link PATH course with GBS and open to all 8 themes
- Must drop class within first week
- Attendees should bring their personal laptops (preferably Mac or Linux) to the class.