Introduction to Programming for Biological Research

Summer 2017

Objectives:

This course, Introduction to Programming for Biological Research (iPBR), aims to teach students the basic principles of computer programming and the power of programming approaches in modern biology research. We assume no prior knowledge of computer programming, and begin from the fundamentals of algorithm design. By the end of the course, students will be familiar with the basics of computer programming in MATLAB, understand the roles of computer science in biology, and be better prepared to employ computational methods in their own research.

Course Staff:

Georgia Squyres: squyres@g.harvard.edu (Instructor)
Matt Smith: matthewsmith01@g.harvard.edu (Instructor)

Registration:

Space is limited! To register, or if you have any questions, please Georgia Squyres at the e-mail address above. Registration will remain open through the first week of classes; the deadline is June 21.

Format:

The course is taught over the eight weeks of the SROH program. The course meets Mondays and Wednesdays from 7-8:30 PM in Northwest Building, Room 243. Each week includes a lecture (Wednesdays, 7-8:30 PM) and a review session (Mondays, 7-8:30 PM). Lectures are given by the course instructors, and cover course material. Review sessions provide an opportunity for students to work in groups, review challenging material with course instructors, and work on weekly or group assignments.

Assignments:

During the first three weeks of the course, short assignments will be issued at the end of lecture each Wednesday. They will be due at the beginning of lecture the following Wednesday. Most of these assignments will include both a written component and a coding requirement, and should be sent, via email, to the corresponding week's lecturer. Assignments will be designed to provide practice with MATLAB so you can familiarize yourself with the syntax and art of coding.

Student projects: After lecture 4, students will separate into groups to begin working on group projects that will comprise the remainder of the course's homework. Groups can choose from any of the projects put forth by the instructors, or propose their own. However, if you are proposing your own project, you must first get it approved by the instructors.

Through the remainder of the class, the students will receive guidance from instructors on how best to push forward their project and what should be done to complete it. During the final lecture students will present their results.

Course Website:

The course website can be found here: http://mcosroh.fas.harvard.edu/summer-course
The course website is updated weekly with lecture slides, supporting code, assignments, and assignment solutions, and contains a copy of the syllabus and other course documentation.

Syllabus:

Date	Lecture topic	Instructor
Wednesday, June 14	Why code, and what is it?	Georgia
Monday, June 19	Review session	
Wednesday, June 21	Introduction to Matlab part I	Matt
Monday, June 26	Review session	
Wednesday, June 28	Introduction to Matlab part II	Matt
Monday, July 3	No class!	
Wednesday, July 5	Data analysis	Georgia
Monday, July 10	Review session	
Wednesday, July 12	Mathematical modeling	Georgia
Monday, July 17	Review session	
Wednesday, July 19	Sequence alignment	Matt
Monday, July 24	Review session	
Wednesday, July 26	Image processing	Matt
Monday, July 31	Review session	
Wednesday, August 2	Student presentations	You guys!