Matlab for Biologists
Bio 410/510 Spring 2018

Lecture: 9:00-9:50am Mon
Lab: 9:00am -12:50pm Weds

Instructor: Cristopher Niell
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Office Hrs: Tues 3-4pm (LISB 214)

GTF: Elliott Abe
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Office Hrs: During lab section

Description
Scientific programming is an essential skill for biological research in the 21st century. This course will provide an introduction to programming, using the Matlab environment, for students with none to minimal previous experience. We will use focus on tools and applications relevant to biology, but the skills will be applicable to a wide range of scientific endeavors. Furthermore, the basic programming knowledge should greatly facilitate learning other languages such as python or R. However, it should be noted that this course is meant to be a practical "how-to" introduction, rather than the theoretical foundation that would be provided in a computer science course.

Each week, new concepts will be introduced in a lecture on Monday, which will include direct demonstration of the use in Matlab. "Lecture notes" will be provided, which consist of the Matlab script generated through the course of the lecture. On Wednesdays, there will be a hands-on lab session to work through several problems that will be provided. The lab will be preceded by a short lecture including a review of the week's concepts and an outline of the lab problems.

Requirements

Homework – After each Wednesday lab session I will distribute a homework set consisting of 1-3 programming problems, as well as occasional written questions. These should be completed and returned by midnight on the following Tuesday. Programming problems should be submitted as matlab scripts.

Exams – There will be two exams, which will be in a similar format to the homework assignments, but will be completed during Friday lab sections.

Grading

Homework	30%
Midterm	30%
Final Exam	40%

Schedule

Apr 2 Lecture: Variables and mathematical operations
Apr 4 **No Lab**

Apr 9 Lecture: Plotting
Apr 11 Lab: Computations and plotting

Apr 16 Lecture: Data input/output
Apr 18 Lab: Data input/output

Apr 23 Lecture: Control structures
Apr 25 Lab: Control structures

Apr 30 Lecture: Creating functions
May 2 Lab: Functions

May 7 Midterm review
May 9 **Midterm exam**

May 14 Lecture: Statistics
May 16 Lab: Statistics

May 21 Lecture: Image processing
May 23 Lab: Image processing

May 28 Memorial Day – no class
May 30 Lab: Analyzing biological data

Jun 4 - Overview
Jun 6 – **Final Exam**