Matlab for Biologists  
Bio 410/510 Spring 2016

Lecture: 9:00-9:50am Weds  
Pre-lab orientation: 9:00-9:50am Fri  
Lab: 10:00am -12:50pm Fri

Instructor:  Cristopher Niell  
Email: cniell@uoregon.edu  
Office Hrs: Thurs 1-2pm (LISB 214) starting April 7

GTF: Nick Ponvert  
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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 Wednesdays, 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 Fridays, 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 Friday lab session I will distribute a homework set consisting of 1-2 programming problems, as well as occasional written questions. These should be completed and returned by midnight on the following Thursday. 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

Mar 30 Lecture: Variables and mathematical operations
April 1 No Lab

Apr 6 Lecture: Plotting
Apr 8 Lab: Computations and plotting

Apr 13 Lecture: Data input/output
Apr 15 Lab: Data input/output

Apr 20 Lecture: Control structures
Apr 22 Lab: Control structures

Apr 27 Lecture: Creating functions
Apr 29 Lab: Functions

May 4 Midterm review
May 6 Midterm exam

May 11 Lecture: Statistics
May 13 Lab: Statistics

May 18 Lecture: Image processing
May 20 Lab: Image processing

May 25 Lecture: Analyzing real biological data
May 27 Lab: Neural data

June 1 - Overview
June 3 – Final Exam