Matlab for Biologists  
Bio 410/510 Winter 2020

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

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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

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Schedule

Jan 6 Lecture: Variables and mathematical operations
Jan 8 No Lab

Jan 13 Lecture: Plotting
Jan 15 Lab: Computations and plotting

Jan 20 No class: MLK holiday
Jan 22 Lab: Data input/output

Jan 27 Lecture: Control structures
Jan 29 Lab: Control structures

Feb 3 Lecture: Creating functions
Feb 5 Lab: Functions

Feb 10 Midterm review
Feb 12 Midterm exam

Feb 17 Lecture: Statistics
Feb 29 Lab: Statistics

Feb 24 Lecture: Image processing
Feb 26 Lab: Image processing

Mar 2 Lecture: Analyzing biological data
Mar 4 Lab: Analyzing biological data

Mar 9 Overview
Mar 11 Final Exam