Collaboratory Workshop
Intro to MATLAB

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Winter 2022

Course website: Collaboratory website
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Dates: Jan. 18, 19, 20
Hours: 9:30 am - 12:00 pm
Location: Online (Zoom)

Course Description

MATLAB is a powerful, high-level programming language for numerical computation, visualization, and application development. This workshop will start by introducing the MATLAB environment and then cover working with arrays and matrices, loops and conditional statements, writing your own functions, working with files and visualizing your data. The final day will briefly introduce utilizing MATLAB to solve differential equations and the basics of computational systems biology modeling using MATLAB. The course is supplemented with many hands-on exercises.

Prerequisites

There is no prerequisites for this workshop. This workshop is suitable for those with or without coding experience in other languages.

Technical Requirements

Computer with access to MATLAB and to the internet to participate in the coding component of the course.

- UCLA students, faculty and staff, can install MATLAB or access MATLAB online with a UCLA licence from the UCLA Software Center website.
- External participants can download MATLAB or access MATLAB online from mathworks.com (does not include licence).

Course Material

The complete course material (recordings, slides and scripts) will be made available daily on the Collaboratory Google Drive (link will be sent to participants at the beginning of the workshop).

Course Objectives

Students will gain proficiency with MATLAB. In particular, they will learn:

- The basic syntax of MATLAB.
- How to use conditional statements, loops and functions.
- How to read and write data.
- How to generate plots.
- How to write code that is easy to read and understand.

Assessment

An assignment will be provided at the end of the workshop. It is mandatory for UCLA students taking the workshop for credit (via BIOINFO 275A/B), and optional for the other participants. The assignment is divided in 2 parts:

- A quiz aimed at testing your basic MATLAB knowledge.
- A set of coding exercises aimed at testing your MATLAB pro-efficiency.

Assessment and correction will be based on a two-step iterative process:

- Participants ***can*** **submit a first version of their work (potentially accompanied with questions) by Saturday February 5, 2022** ('optional' deadline, two weeks after the workshop). The instructor will send a detailed correction within a week.
- Participants ***have to*** **submit the final version of their work by Saturday February 19, 2022** ('mandatory' deadline, a month after the workshop).

The final grade will be calculated based on the last submission.

Late assignments will be accepted for no penalty if a valid excuse is communicated to the instructor before the deadline.

Course Policies

During Class

The workshop will be 100% online this quarter due to COVID-19 restrictions. Participants will be expected, if possible, to turn on their cameras and microphones to introduce themselves at the beginning of the workshop, but can keep them off the rest of the time. Participants are encouraged to ask questions at any time during the workshop by posting them in the chat or by using the raising hand feature. Follow-up questions can be asked by email.

Attendance

Attendance is expected in all sections and will be recorded for UCLA students taking the workshop for credits (see BIOINFO 275A/B). Valid excuses for absence will be accepted before class, and course material (including recordings) will be made available to all the participants.

Inclusive teaching

This workshops is addressed to anyone interested in the topic, independently of their background and other individual characteristics, including potential disabilities. Reasonable accommodations cab be made for participants with disabilities. Participants are expected to follow UCLA Code of Conduct.

Schedule and Daily Learning Goals

Day 1	**Day 2**	**Day 3**
Navigating the interface	`for` and `while` loops	Reading and writing files
Command lines and basic syntax	Matrix manipulation	Generating figures
Variable types and operations	Writing and executing functions	Intro to dynamical systems
Writing and executing scripts		
Conditional (`if`) statements		