

## ASTR 121 – Spring 2016

### Lab 1 – Introduction to MATLAB: Prelab Questions

Due Monday, [Date TBA]

To prepare for the first computer lab, where you will learn the basics of the MATLAB data analysis and visualization environment, carry out this pre-lab assignment on your own.

Installing your own copy of MATLAB as described below could be beneficial for your studies while at the University of Maryland, but it is not a requirement for the ASTR 121 lab.

1. If you have a personal computer or laptop, install the (free) student-licensed version of MATLAB on it:
  - a. Open a browser and go to <https://terpware.umd.edu/Windows/Package/2053> (this is for the PC version of MATLAB—links on this page are available for the Mac or Linux versions if you prefer).
  - b. Follow the instructions for downloading and installing MATLAB for your operating system (you will also need to download the document containing the activation key). You will need to log in using your directory ID.
  - c. Note you may need to connect to a license server with VPN software to use MATLAB off campus. Follow the instructions on the UMD site. VPN software is available at <https://terpware.umd.edu/Windows/Package/2039> if you need it.
2. If you do not have a personal computer or laptop, go to one of the many IT Computer Labs on campus (see <http://www.it.umd.edu/as/cl/>) or the Astronomy undergraduate computer lab (CSS 1220).
3. Open MATLAB, then from the drop-down menu select Help → Documentation → MATLAB → Getting Started with MATLAB (you may also find a direct link to this page on the opening screen).
4. You should see a list of available tutorials (the first is “Desktop Basics”). Read through these tutorials and follow along by typing the examples into the MATLAB command window. Optionally, watch the “Getting Started with MATLAB” tutorial video.
  - a. The most important tutorials are “Desktop Basics,” “Matrices and Arrays,” “Workspace Variables,” “Calling Functions,” and “2-D and 3-D Plots.”

- b. Some of the examples involve possibly unfamiliar “matrix operations,” such as taking the transpose or inverse of a matrix. If you have not had a course in vector/matrix algebra yet, just skip those examples, but you still need to know how to manipulate arrays and matrices. Basically an array is usually a collection of numbers, and a matrix is made up of rows of arrays. With MATLAB there are easy ways to do operations on all the elements of an array or a matrix at once.
- c. You can safely ignore all examples involving complex/imaginary numbers.

That’s it! If you have any trouble with these steps, bring your questions to the lab. It’s ok if you were unable to complete this pre-lab assignment—you will do similar exercises in lab to familiarize yourself with MATLAB.