

INTRODUCTION TO PYTHON

Welcome to your Computer Lab!

You may be wondering, “Why a computer lab in a Calculus course?” There are several reasons discussed below. One major reason is that many of you are students in the College of Engineering and are learning (or will learn) Python in your ENGR 102 course. This lab gives you an integrated curriculum; one whereby you apply techniques of Python programming to help solve Calculus problems. Generally, these computer labs will contain three types of problems:

- 1) Problems which allow you to review the general algorithmic processes to solve by hand while eliminating the tedious algebraic and computational aspects.
- 2) Problems which allow you to visualize some of the important principles of Calculus to help improve conceptual understanding.
- 3) Problems (often of a practical nature) which are too algebraically and/or computationally tedious to solve by hand.

We will spend the first labs reviewing the basic commands of Python (numerical calculations, substituting, symbolic manipulation, solving equations, and plotting graphs). Since most labs will be done in teams, we will wait to start until add/drop is finished. For now, some important information about the Python interface we will be using, Jupyter, and basics about the Python program itself.

HOW TO GET JUPYTER AND PYTHON ON YOUR DEVICE

Obviously, since Python labs are worked in and outside of class, you will need to have the software on your device. The Jupyter interface we use in your math courses may be different from the interface used in ENGR 102 (such as PyCharm or Spyder), but ALL these interfaces run Python! The Jupyter notebook makes it easier to collect your input, Python’s output, and graphs all in one “Notebook”, which your team will use to produce one PDF file to upload when you are done. **NOTE:** if you prefer to use another interface, you may do so, but it is YOUR team’s responsibility to figure out how to put their code, Python’s output, and all graphs in ONE easy-to-follow PDF file. If you need to download Jupyter, it is part of the Anaconda package (which also include Python). Here are the steps to download it:

- 1) Go to www.anaconda.com/products/individual
- 2) Near the bottom of the page, you will find “Anaconda Installers”. Click on the one appropriate to your operating system (Windows, Mac, or Linux). If the link to the top version doesn’t work, try the bottom version.
- 3) Once the installer is downloaded, click on it to install the software (as you would any other app)
- 4) After the Anaconda software is installed (it may take a while!), find Jupyter in your usual start menu (probably under “Anaconda”). Alternatively, open a command window and type “jupyter notebook”.
- 5) When you run Jupyter, you may be asked which app to run it in. Jupyter opens in a browser window, so choose your favorite browser.