Biology 610: Scientific programming for biologists

This purpose of this course is to introduce graduate students to core concepts in programming using the Python language. Students are **not required** to have any previous experience with programming-- if you do have previous experience consider this an excellent opportunity to practice "Beginner's mind". The course will be taught in an interactive, workshop-like environment where we will go over code together. This environment will benefit the active participant, so please do you best during class to concentrate on the material at hand rather than blowing it off until later (even if Andy is terribly boring). Below is the tentative schedule for the course. Depending on the speed we go through topics there might be shifts in the schedule.

January 8. Getting Python going on your machine

Installing anaconda, jupyter notebooks, python baby steps

January 10. Python programming language

Printing, data structures, indexing

January 12. Python language continued

Control flow, conditionals, looping. Assignment 1 handed out.

January 17. Functions, Modules

Writing our own functions. Getting functions from other sources

January 19. Numpy and Scipy

Using numpy and scipy to boost our productivity. ndarrays, indexing, etc.

January 22. Matplotlib, plotting data

Basics of matplotlib, histograms, scatterplots, making things pretty. Assignment 2 handed out.

January 24. Pandas, dealing with data

Using the pandas library to analyze data. Import, export, manipulations, plotting.

January 26. More pandas / scipy / matplotlib

Doing statistical analysis with pandas / scipy. Basics of simulation.

January 29. Putting it all together

Doing simulations using python. Assignment 3.

January 31. Biopython

Using biopython to handle sequence data. More advanced string stuff