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 9. Getting Python going on your machine

Installing anaconda, jupyter notebooks, python baby steps

January 11. Python programming language

Printing, data structures, indexing

January 13. Python language continued

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

January 16. Numpy and Scipys

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

January 18. Matplotlib, plotting data

Basics of matplotlib, histograms, scatterplots, making things pretty.

January 20. Scipy for data, optimization, Pandas

Getting more useful with Scipy for data analysis. First looks at Pandas. Assignment 2 handed out.

January 23. Simulation of Genetic Drift

Using our skills to simulate some the population genetic model of genetic drift.

January 25. Biopython

Using biopython to handle sequence data. More advanced string stuff

January 27. Scikit-allel for population genetics

Population genetic analysis using Alistair Miles' very excellent scikit-allel package. Assignment 3.

January 30. tbd