Biol 107a – Data analysis and statistics workshop
Syllabus

Part I: Plotting and basic statistics
Basic plots
X-Y plots
Histograms
Cumulative density histograms / percentiles

Basic computer processing
Reading data from disk
Simple processing in Matlab/Octave

Basic stats:
Hypothesis testing
Non-parametric tests
Parametric tests

Part II: Analyzing physical data
Fitting
Using basic fits (methods, quality of fits, garbage-in / garbage-out)
Innovating with fits; model selection, and the bootstrap

The design of robust index values

Time series analysis
Sampling: analog/digital issues, filtering, Fourier analysis, aliasing
Signal detection (including issues of noise and garbage-in/garbage-out)
Continuous signals vs. discrete events
Correlation

Image analysis
Understanding image systems (brightness vs. look up tables, dynamic range)
Imaging processing: feature detection, tracking regions of interest

Computerized representations of data
Using data structures
Generating random data / sanity checking
Reading data from disk part 2
Storage of results

Classifiers
Clustering
Dimensionality reduction with principal component analysis

Advanced plotting
Using color, symbols, geometry