**Pabio 536: Bioinformatics, Gene Sequence Analysis and Beyond**

**Syllabus**

*Co-taught by David Sherman, Shuyi Ma, and Tige Rustad*

The goal of this class is to introduce students to a set of bioinformatic tools they can use to further their future research. The first section of the class will introduce the basics of Github, python, and some of the python libraries for data handling, analysis, and presentation. We will then focus on tools for analyzing sequence data, with an emphasis on RNAseq analysis. The data will be used in the next section, where we will cover various ways of describing data using networks. The last classes will cover bioinformatic approaches to dealing with the added complexity of proteins. We will wrap up the class with a self-guided project, where students use the tools from this class to solve a \*reasonable\* problem of interest to them or their lab.

Students need to bring laptops with them every class. Windows, Apple, or Unix operating systems are all acceptable. Before class begins students need to install two software packages:

1. The program for running git commands, select the one specific for your OS:
   1. <https://git-scm.com/downloads>
2. The Anaconda distribution of python, python tools, and many common python libraries
   1. <https://www.anaconda.com/distribution/>
      1. Select your OS
      2. Download the newest version
      3. Install using all the default settings
      4. Test your installation by running the Anaconda prompt and try these two commands:
         1. conda -–version
         2. jupyter notebook
      5. The first should show you the current version installed and the second will open a browser window showing your local files
3. Finally, please create a free account at [www.github.com](http://www.github.com)
   1. Student discounts available if you want more Github access, but it’s not necessary for the class

Grades will be based on participation (10%), homework (70%), and the final project (20%).

Most classes will start with a brief lecture/tutorial. Most classes will have an assignment, which will be due by the start of class the following Monday. Your grade will be based on the work that you turn in. There will be a final project, but there will not be any exams. The class time set aside for finals will instead be used for completing the final project.