

# **Bioinformatics, Biology 653, Fall 2017**

**Instructor of Record/Course Director:** Dr. Bert Ely, [ely@sc.edu](mailto:ely@sc.edu)

**Course Instructor:** Geetha Saarunya S, [sreeramc@email.sc.edu](mailto:sreeramc@email.sc.edu)

**Class Schedule:** Tuesday & Thursdays, 1:15Pm-2:30Pm , CLS 202

**Office Hours:** Mondays, Wednesday & Fridays: 10AM-3PM

**Required Materials:** Personal Laptop  
USB flash drive(>4gb) for data storage

**Prerequisites:** BIOL 302 & 303

## **Course overview:**

BIOL 653 for Fall 2017 is a 3-credit hour project-based course with a focus on genomic data studies and analyses. The general idea of the course is to expose the students to critically examine and analyze published /in-preparation datasets in a hands-on fashion. The course is divided into four modules spread across 10 weeks. The Modules will be as follows: Genome assembly and annotation, Comparative Genomics, Metagenomics , RNA-Seq analysis and Biomedical data analysis. Each module will be 2.5 weeks long. The instructor will introduce to the students a set of two research problems at the start of a module: One in Prokaryotic system and the other in Eukaryotic system. At the end of the module, students will present their data analysis in the form of a project report. For the final project, students will design a research problem on their topic of interest (needs to be discussed and pre-approved by the instructor) and write a report justifying their research hypothesis, methodology and result summarization. Students will also have an opportunity to present their final report as a poster at the end of the semester through ISCB-RSG-SE USA (International society of Computational biology-Regional student group-South East USA) conference to be held at University of South Carolina.

## **Course outcomes and competencies:**

The learning objectives of this course include the following:

- I. To familiarize the students with various Next-gen sequencing technologies, data output and manipulation, analyzing their strengths & weakness', identifying alternate methodologies to answer research question.
- II. To introduce to the students the best practices of computational biology data analysis for each module.
- III. To familiarize the students with command line programming, Open-source genomic software usage, and working with R statistical package.

The Core competencies of this course includes:

- I. The ability to design Bioinformatics experiment and analysis based on the research question about specific molecular measurement.
- II. The ability to design and troubleshoot analysis of sequencing data and at the same time elicit biological information from the data.

**Course Expectations:**

- Read assigned chapters and papers on :
- Complete homework assigned on Blackboard
- Attend all classes to solve in class assignments.
- Students are responsible to adhere to homework and project deadlines.
- Blackboard is to be used for class announcements, assignment submission and grade viewing.

**Grading scheme:**

The final course grade will be based on the following point distribution:

1. Module Projects = 4 X 80 = 320 points
2. Class participation = 80 points
3. Final Project = 100 Points

The maximum score a student can get is 500.

A  $\geq 450$  , B+  $\geq 425 \leq 449$  , B  $\geq 400 \leq 424$  , C+  $\geq 375 \leq 399$  , C  $\geq 350 \leq 374$  , D+  $\geq 325 \leq 349$  , D  $\geq 300 \leq 324$  , F  $\leq 299$

**Attendance:**

Students are expected to attend all classes. Each class will have 20 minutes of lecture and 40 minutes of hand-on lab practical. Missing three classes will result in a loss of 10 % from class participation points. Arriving late by more than 10 minutes will count as a missing class. Prior permission and alternative arrangement has to be made with the instructor for a make-up class.

**Classroom policies:**

1. Students are expected to have their personal laptops and work with instructor on downloading of programs and softwares required for the class.
2. Students engaging in disruptive behavior, including but not limited to, cell phone usage, social media surfing and talking in class, will be asked to leave the class room. And this will count for one class absence.
3. No food or drink will be allowed in lab.
4. Students are expected to maintain the highest standards of academic integrity. All reports will be submitted to safe-assign to check for plagiarism. Any breach to this expectation will result in failing the assignment and referral to the Office of Academic integrity.
5. Reach out the instructor in advance for any issues or problems pertaining to classroom policies.