

# FA21-BL-BIOL-Z620-46585 (NCGAS Bioinformatics Course)

## Course Syllabus

### Course Description

This course is taught by the National Center for Genome Analysis Support (NCGAS) Staff and will teach the use of high performance computing (HPC) systems and bioinformatics methods. The goal is to prepare students to analyze data generated by projects in the Genomics and Eco-evolution of Multi-Scale Symbioses (GEMS) program, but non-GEMs students should find the material informative. This semester, we will cover a workflow to assemble a new bacterial genome from raw Illumina and Nanopore reads, followed by downstream analyses with the new genome. During this process, we will also cover HPC skills such as command line, data and software management, and job handlers - all important in making your analyses go smoothly.

**Time and location of class meetings.** Thursdays from 10AM -12PM, virtual via Zoom

**Office hours:** On-line help office hours will be available through Discord on Tuesdays from 1PM-3PM.

### Learning Outcomes

Upon completion of this course, students should be able to:

1. find, load, run, and scale jobs on the cluster efficiently
2. read and evaluate various genomic data formats
3. understand the general workings of various genome assemblers
4. assemble genomes with different data combinations
5. describe the biases of various software and how to control for them in their analyses
6. perform QC analyses on raw data and post-analyses
7. assess the quality of published genomes
8. plan future projects
9. describe and perform downstream analyses with genomes

### Course Requirements

#### Required Text and Materials

- All text and materials will be provided. There is no textbook.

# Technical Requirements

You will need the following in order to participate in this course:

- Computer or tablet;
- Reliable internet connection;
- Microphone;
- Access to Canvas using a [supported web browser](#).

## Technical Support

For additional help with technical issues, consult:

- [University Information Technology Services \(UITS\) \(Links to an external site.\)](#) (human support)
- [IU Knowledge Base \(IUKB\) \(Links to an external site.\)](#) (guides)
- [IUware \(Links to an external site.\)](#) (download free software)

## Course Assessment & Grades

### Course Assessment:

Grades will be determined from the following:

- 40% Participation
- 40% Completion of Demos
- 10% Discussions
- 10% Genome Paper Review

Demos, discussions, and paper assignments will be turned in and graded through Canvas. There is no final exam. If there are any questions about the grading or expectations, please contact the instructor associated with the activity well in advance of the due date.

### How Will I Know How I'm Doing in This Course?

Grades will be posted in Canvas. Since Canvas keeps track of all of your grades, you should always be able to calculate your current grade in the course. If you need assistance, please contact the instructors via Discord.