

Welcome!

The primary goal of the course is to provide theory and practice of computational genomics, and empower to conduct independent genomic analyses.

- ▶ We will study the leading computational and quantitative approaches for comparing and analyzing genomes starting from raw sequencing data.
- ▶ The course will focus on human genomics and human medical applications, but the techniques will be broadly applicable across the tree of life.
- ▶ The topics will include genome assembly, variant identification and analysis, gene- and miRNA expression, methylation and epigenomic analysis, copy number variant analysis, metagenomics, single-cell analysis, 3D genomics, and cancer genomics.

Logistics

- ▶ Course Webpage:
<https://mdozmorov.github.io/BIOS668.2018/>
 - ▶ Lecture notes in PDF, exercises R code, references will be posted there
- ▶ Course Discussions: <https://blackboard.vcu.edu>
 - ▶ Announcements, assignments, homework submission and grading
- ▶ Class Hours: Monday/Wednesday, 9:00 am to 10:20 am
- ▶ Office Hours: Monday/Wednesday 10:30 am to 12:00 pm at Biostatistics Office 730.
 - ▶ Any other time - by appointment

Prerequisites

- ▶ BIOS 567 (Statistical Methods for High-throughput Genomic Data I), BIOS 692 (Reproducible Research Tools)
- ▶ Access to an Mac or Linux machine, or, for Windows machines, install VirtualBox
- ▶ Familiarity with the Unix command line for exercises
- ▶ Familiarity with R programming environment
- ▶ Knowledge of Git and GitHub for homework submission

Resources

- ▶ Primary Texts: We will be studying primary research papers
- ▶ Lecture notes will contain many footnotes with links. Make a good use of them, explore the references on your own!
- ▶ Other Resources: Google, SEQanswers, Biostars, StackOverflow

Grading Policies

- ▶ Homework assignments practicing methods and tools learned in class: 50% of the total grade. Due at 9:00am ~two weeks after assignment
- ▶ Paper reading is important. Paper notes will be graded
- ▶ Final Project developing a fully reproducible genomics analysis: 30%. Pre-proposal due in the middle of the semester, the final project due at the end
- ▶ Class attendance and participation: 20%.
- ▶ Deadlines are mandatory
- ▶ Discuss homework with your peers, work together, but provide your own solution

Course evaluation

- ▶ At the end of the course, you will be asked to evaluate it
- ▶ Assess what you learned during the course
- ▶ Take notes on what you like in the course, what you want to be improved
- ▶ Your evaluation is anonymous