Honors Computational Genetics
01:447:203
Course Information and Policies

Semester:	Spring 2021
Classroom:	Online via Zoom (see Canvas for meeting link)
Meeting Times:	Mondays and Thursdays, 9:00-11:30am
Office Hours:	TBD (see Announcements on Canvas)
Course URL:	**https://canvas.rutgers.edu**

Course Instructors:	Dr. Chris Ellison chris.ellison@rutgers.edu Office hours: by appt

Teaching Assistant:	TBD
Undergraduate Assistant:	TBD

Course Design: Special thanks to Eric Chai and Rohith Kari for their assistance in preparing materials for this course.

Course Description: Honors computational genetics is a computer-based laboratory course that introduces students to the use of computers in biological research. This course is for freshman and sophomore Honors students who are thinking of careers at the intersection of life sciences, statistics, and/or computer science, particularly students who are considering majoring in Genetics. The course fulfills the laboratory requirement for the Genetics major. In the first half of the course, students will receive instruction in introductory computer programming (Python). In the second half of the course, students will practice writing code in Python via in-depth computational projects in genetics and genomics. Each class consists of a mixture of lecture and computer-based demos and/or exercises, as well as time for students to work on assignments. The course provides the introductory skills needed to conduct basic computational research in the life sciences, including many aspects of computer programming and genomic data analysis.

Credit cannot be received for both 01:447:203 and 01:447:302

Pre-requisites: Students must be in their first or second year at Rutgers in an approved Honors program (e.g., the Honors College or the SAS Honors Program). Students must have previously completed (or be concurrently enrolled in) General Biology I and II (01:119:115 and 01:119:116) or have placed out of these two courses (e.g., through AP credit or approved transfer credit).

Course Goals:
During this course students will:

1. Idependently design, code, and test short Python programs
2. Gain exposure to how computational methods are used in genetics research
3. Use Python and Unix commands to analyze large genetic and genomic datasets

Core Curriculum Learning Goals Met by this Course: Info Tech & Research [ITR]

- Goal: Employ current technologies to access information, to conduct research, and to communicate findings.

Course Materials: No textbook is required as all of the needed material is made available during class.

Online resources:
Whirlwind Tour of Python eBook (free):
https://www.oreilly.com/programming/free/files/a-whirlwind-tour-of-python.pdf
Think Python eBook (free): http://greenteapress.com/wp/think-python-2e/
Official Python Tutorial (free): https://docs.python.org/3/tutorial/index.html

Contacting the Instructors: The best way to contact the instructor is by email.

Attendance: Attendance is expected at all classes; in-class demos and exercises are an integral part of this class and it is difficult to make-up work when class is missed. If you must miss a class, please use the University absence reporting website https://sims.rutgers.edu/ssra/ to indicate the date and reason for your absence. An email is automatically sent to the instructors. It is unlikely you will pass this course if you have extended or repeated absences.

University policy regarding long-term absence:
If you anticipate missing more than one week of classes for serious illness, confidential, or sensitive personal reasons, you should notify the instructors immediately and also consult with a Dean of Students (http://deanofstudents.rutgers.edu/locations/) who will help to verify your extended absences from classes.

We will do our best to accommodate longer periods of absence that have been verified through the Dean of Students, however, contacting the instructors after several classes have already been missed greatly reduces the options available to us.

Assignments, Due Dates, and Course Announcements: You are responsible for being aware of all assignment due dates, which are included with each assignment. Unless otherwise noted, homework assignments from the previous class are due at the beginning of the next class. Changes to due dates or lecture topics will be announced in class and/or will be posted on the class Canvas website. **There are no late submissions**: You will be graded on whatever is present in your Assignment folder at the time the assignment is due. **There is no extra credit or make-up work available for this class.** However, we will drop the lowest score from your homework assignments and quizzes before calculating your final grade. Step-by-step instructions for fetching and submitting homework assignments are covered in the lecture materials from the first class.

Computers: All computational analyses will be conducted on a Rutgers computer cluster that can be accessed through a web browser. No special computer is required as long as you are able to access the internet and use Zoom.

Accessing materials from home: You will need to use a Virtual Proxy Network (VPN) to access the Rutgers cluster from home. We will cover how to install and run the VPN in class.

Performance Expectations and Evaluation: The course is graded on the basis of weekly assignments, short quizzes, a midterm programming exam and the final exam. The midterm and final exams will account for 15% and 20% of the final grade, respectively. All assignments will be turned in online, following instructions provided by the instructor.

Grades will be calculated based on overall course performance. The following grading scale will be used: 90% A 87% B+ 80% B 77% C+ 70% C

D and F grades will be determined based on the final score distribution at the end of the course.

Student Collaboration:
Students are encouraged to interact with other students while doing assignments in class, and in some cases may be required to work with one another. However, assignments that are turned in for grading must represent each student's individual work – they may not be copies or modified versions of another person's work.

Academic Integrity: ***We expect the honesty and integrity of every student in this course.***
Scientists, doctors, and all professionals must be intellectually honest. Scientists who fabricate data or commit plagiarism lose their grants and jobs. Plagiarism, a form of cheating, is quite easy to do. If you "cut and paste" from any source and then try to change a few words, this is still plagiarism. Never use terms unless you know the meaning of them. If the instructors suspect plagiarism, we will ask you to come in and explain your answers or writing. The official Rutgers policy on cheating can be found here: **http://academicintegrity.rutgers.edu**
There are at least 5 categories of violations: cheating, fabrication, plagiarism, denying others access to information or material, and facilitating Violations of Academic Integrity. Students who violate the Rutgers Integrity policies will be reported to the Office of Student Conduct. Sanctions will be determined by the Office of Student Conduct according to the procedures described in the University Policy on Academic Integrity.

Student-Wellness Services:

Counseling, ADAP & Psychiatric Services (CAPS)
http://health.rutgers.edu/medical-counseling-services/counseling/ (848) 932-7884
CAPS is a University mental health support service that includes counseling, alcohol and other drug assistance, and psychiatric services staffed by a team of professional within Rutgers Health services to support students' efforts to succeed at Rutgers University. CAPS offers a variety of services that include: individual therapy, group therapy and workshops, crisis intervention, referral to specialists in the community and consultation and collaboration with campus partners.

Violence Prevention & Victim Assistance (VPVA)
(848) 932-1181 / 3 Bartlett Street, New Brunswick, NJ 08901 / vpva.rutgers.edu
The Office for Violence Prevention and Victim Assistance provides confidential crisis intervention, counseling and advocacy for victims of sexual and relationship violence and stalking to students, staff and faculty. To reach staff during office hours when the university is open or to reach an advocate after hours, call 848-932-1181.

Disability Services
(848) 445-6800 / Lucy Stone Hall, Suite A145, Livingston Campus, 54 Joyce Kilmer Avenue, Piscataway, NJ 08854 / https://ods.rutgers.edu/

The Office of Disability Services works with students with a documented disability to determine the eligibility of reasonable accommodations, facilitates and coordinates those accommodations when applicable, and lastly engages with the Rutgers community at large to provide and connect students to appropriate resources.