Honors Computational Genetics
01:447:203

Course Information and Policies

Semester: Fall 2017
Classroom: Nelson B125
Meeting Times: Tuesdays and Fridays, 10:20-1:20
Course URL: https://sakai.rutgers.edu

Course Instructors:
Dr. Chris Ellison chris.ellison@rutgers.edu
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848-445-3841 848-445-3125
Nelson B420 Nelson C205
Office hours: Thurs 3-4 or by appt Office hours: by appt.

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 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. Guest investigators will make short presentations (in person or by skype) to provide illustrations of how programming and informatics is critical for their research. 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 year at Rutgers in an approved Honors program (e.g., the Honors College or the SAS Honors Program). Students must have previously completed 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. Independently design, code, and test short Python programs
2. Gain exposure to how computational methods are used in genetics research
3. Use Python to manipulate 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. A useful resource to have on hand if you prefer to have a printed book is:
Online resources:
Think Python eBook (free):  http://greenteapress.com/wp/think-python/

Contacting the Instructors: The best way to contact the instructors is by email.  NOTE: we get scores of email each day.  To ensure your email is noticed, be sure to put “Comp Genetics 2017” in your email subject header.  We try to respond within 24 hours M-F.

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. In the case of a medical emergency or equally serious unforeseen circumstance, please contact the instructors and/or one of the Student-Wellness services listed at the end of this document as soon as possible and we will do our best to arrange for accommodation. Contacting the instructors after several classes have already been missed greatly reduces the options for accommodation.

Assignments, Due Dates, and Course Announcements: You are responsible for being aware of all assignment due dates, which are included with each assignment. Changes to due dates or lecture topics are made in class and/or will be posted on the class Sakai website. There are no late submissions. Most assignments are handed in online. If a class must be missed when an assignment is due, in order to receive credit, the assignment must be uploaded online by the deadline. There is no extra credit or make-up work available for this class.

Computer Use: A username and password is assigned to use on the Windows computers in the computer lab for the duration of the course. These student accounts provide individual space for class work. The lab computers cannot be accessed outside of class, therefore each student should transfer their files to the cloud (DropBox, etc) or a USB drive at the end of each class. Printing is not available during class.

Laptop computers are welcome in class. There is wireless access to the Rutgers network from the classroom (called RUWireless-DLS).

At the End of Class, Before Leaving: Backup your entire scratch space folder to a USB Flash Drive or to the cloud. Shutdown your computer and turn off the monitor.

Classroom Time: Computers are for work in Computational Genetics. Please do not do other work, email, or web browse, etc. during class.

Performance Expectations and Evaluation: The course is graded on the basis of weekly assignments, short quizzes, and the Final Exam. The Final Exam is an in-class cumulative exam that accounts for 20% of the final grade. 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, when asking another student for help, you may show them your code, but you may not view theirs. Furthermore, 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. Doctors who fake lab results or are dishonest in other ways not only lose their jobs and licenses but might also go to jail. 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/](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:**
- **Just In Case Web App**  
  [http://codu.co/cee05e](http://codu.co/cee05e)
  Access helpful mental health information and resources for yourself or a friend in a mental health crisis on your smartphone or tablet and easily contact CAPS or RUPD.

- **Counseling, ADAP & Psychiatric Services (CAPS)**  
  (848) 932-7884 / 17 Senior Street, New Brunswick, NJ 08901 / rhscaps.rutgers.edu/  
  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/](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.

- **Scarlet Listeners**  
  Free and confidential peer counseling and referral hotline, providing a comforting and supportive safe space.