

Biology 610
Population Genetics
Winter 2023

Course Meeting Time: MW 10:00 am -11:20 am; F 10:00 am - 10:50 am
Course Meeting Location: Price Science Commons B042

Instructor Information

Nadia Singh

Office Location: Pacific 313

email: nsingh@uoregon.edu

Office Hours: By appointment.

Course description: Evolution is defined as the change in allele frequencies in populations. Population genetics explores how allele frequencies change in populations over time by modeling the four main evolutionary forces - natural selection, genetic drift, mutation and gene flow. This course aims to provide students with an understanding of the history of the field of population genetics, the evolutionary forces that shape the genetic composition of populations, and foundational models and concepts at the heart of this field. This goal is accomplished through a combination of lectures, readings from textbooks and the primary literature, and problem solving.

Learning Objectives:

- Become aware of what population genetics is, its connection to our lives, and its importance for the scientific and public communities
- Gain foundational knowledge for key models in population genetics
- Develop working knowledge of types of approaches used to interrogate population genetic questions in natural populations
- Develop understanding of how to interpret population genetic data and connect these data to biological concepts and evolutionary forces acting in natural populations

Class Schedule

Date	Topic(s)	Homework & Reading
2/1	Introduction to Genetic Variation, Models	Reading 1: Genetic variation
2/3	Models	Reading 2: Drift
2/6	Linkage Disequilibrium	Problem Set 1
2/8	Random Genetic Drift I	Reading 3: Neutral Theory
2/10	Random Genetic Drift II	Reading 4: Selection
2/13	Mutation Models, Neutral Theory	Reading 5: Science Spotlight
2/15	Neutral Model	Reading 6: Molecular Population Genetics
2/17	Selection	Problem Set 2
2/20	Mutation-Selection Balance	Reading 7: Signatures of Selection
2/22	Molecular Population Genetics	

Course Website: All course material will be available through Canvas (canvas.uoregon.edu).

Required readings: I will be assigning reading from a variety of sources. By 5:00 pm the day the reading is assigned, I will have posted the readings and assignments on Canvas. These will be in PDF form, so you will need access to a PDF reader on a computer. If this poses a challenge for you, please contact me during the first week of class so we can make alternative arrangements.

Problem Sets: Problem sets will be assigned throughout the course. These will consist of questions that encourage students to think critically about the concepts presented in class. The goal of these assignments is to reinforce and extend the concepts learned in class, while serving as an indicator to the student about his/her own understanding of the material. The assignments will be due **at the start of class**. Students are permitted to discuss the questions with one another, but his/her/their answers must be his/her/their own independent work. Late assignments will not be accepted.

Office Hours: Office hours will be held on by appointment

Communication: All of my communication to you outside of class will take place via email. I will use the email registered to you by the University of Oregon. You may email me with questions or comments. Please send messages from your University of Oregon account and include "BI610" in the subject line. Your email correspondences are an extension of your class participation, so please maintain a professional tone. I will generally respond to email messages within 1-3 days.

Campus resources to support your learning

Tutoring and Academic Engagement Center (<https://engage.uoregon.edu/services/>) Drop-in math and writing support in addition to tutoring, study skills support, and Class Encore. Located in the 4th Floor Knight Library (541) 346-3226, engage@uoregon.edu.

Counseling Center Call anytime to speak with a therapist who can provide support and connect you with resources. Located on the 2nd Floor of the Health Center (541)346-3227

Accessible Education Center The University of Oregon is working to create inclusive learning environments. The instructor believes strongly in creating inclusive learning environments. If there are

aspects of the instruction or design of this course that result in barriers to your participation, please notify us as soon as possible. You are also encouraged to contact the Accessible Education Center. If you are not a student with a documented disability, but you would like for us to know about class issues that will impact your ability to learn, we encourage you to come visit during office hours so that we can strategize how you can get the most out of this course. Located on the 1st Floor of Oregon Hall (541) 346-1155, uoac@uoregon.edu

Center for Multicultural Academic Excellence (CMAE) mission is to promote student retention and persistence for historically underrepresented and underserved populations. We develop and implement programs and services that support retention, academic excellence, and success at the UO and beyond. We reaffirm our commitment to all students, including undocumented and tuition equity students. Located on the 1st Floor of Oregon Hall (541) 346-3479, cmae@uoregon.edu

The *UO Access Shuttle* is an on-campus ride service provided at no cost to students with conditions that limit mobility. More information and a sign-up form can be found on the parking & transportation department website: <https://parking.uoregon.edu/content/access-shuttle>.

Class Courtesy: Please arrive in class on time. Late arrivals distract the instructor and the other students. Please turn off cell phones during the class meeting times. Use your laptop only for class activities. Do not leave class early unless you have cleared it with the instructor in advance. Ask questions if you did not hear or understand something.

Classroom courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, culture, religion, politics, sexual orientation, gender, gender variance, and nationalities. Class rosters are provided to the instructor with the student's legal name. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the quarter (or before) so that I may address you properly.

Our classroom is a learning environment, and as such should be a safe, inclusive and respectful place. Being respectful also includes using preferred pronouns for your classmates. Disrespecting fellow students as well as combative approaches, tones and/or actions are not acceptable. Please make me aware if there are classroom dynamics that impede your (or someone else's) full engagement.

Academic integrity: All students will be expected to adhere to the University's guidelines on academic integrity as outlined in the Student Conduct Code: <https://policies.uoregon.edu/vol-3-administration-student-affairs/ch-1-conduct/student-conduct-code>. As detailed in the policy, academic misconduct means the violation of university policy involving academic integrity. This includes cheating ("any act of deception by which a student misrepresents or misleadingly demonstrates that the student has mastered information on an academic exercise that the student has not mastered"), and plagiarism ("using the ideas or writings of another as one's own.") The instructor has a zero tolerance policy for academic dishonesty. All persons involved in academic dishonesty will be disciplined in accordance with University regulations and procedures.

Students are encouraged to discuss class material with one another, including the reading and homework questions. However, **all submitted written work**, including answers to homework questions, **must be the original work of each student**.

Students with Disabilities: The instructor believes strongly in creating inclusive learning environments. Please notify me if there are aspects of the instruction or design of this course that

result in disability-related barriers to your participation. You are also encouraged to contact the Accessible Education Center in 164 Oregon Hall at 541-346-1155 or uoaec@uoregon.edu.

Discrimination and Harassment

Prohibited Discrimination and Harassment Reporting

Any student who has experienced sexual assault, relationship violence, sex or gender-based bullying, stalking, and/or sexual harassment may seek resources and help at safe.uoregon.edu. To get help by phone, a student can also call either the UO's 24-hour hotline at 541-346-7244 [SAFE], or the non-confidential Title IX Coordinator at 541-346-8136. From the SAFE website, students may also connect to Callisto, a confidential, third-party reporting site that is not a part of the university.

Students experiencing any other form of prohibited discrimination or harassment can find information at respect.uoregon.edu or investigations.uoregon.edu or contact the non-confidential AAEO office at 541-346-3123 or the Dean of Students Office at 541-346-3216 for help. As UO policy has different reporting requirements based on the nature of the reported harassment or discrimination, additional information about reporting requirements for discrimination or harassment unrelated to sexual assault, relationship violence, sex or gender based bullying, stalking, and/or sexual harassment is available at [Discrimination & Harassment](#).

Specific details about confidentiality of information and reporting obligations of employees can be found at titleix.uoregon.edu.

Reporting

The instructor of this class is an Assisting Employee. As such, **if you disclose to me, I will respond to you with respect and kindness. I will listen to you, and will be sensitive to your needs and desires. I will not judge you. I will support you.** As part of that support, I will direct students who disclose sexual harassment or sexual violence to resources that can help. **I will only report the information shared to the university administration when you as the student requests that the information be reported** (unless someone is in imminent risk of serious harm or is a minor). Please note the difference between 'privacy' and 'confidentiality.' As a Student Directed Employee I can offer privacy because I am not required to report certain information to the university. However, I cannot be bound by confidentiality in the same way that a counselor or attorney is. Confidential resources such as these means that information shared is protected by federal and state laws. Any information that I as a student-directed employee receive may still be accessed by university or court proceedings. This means, for example, that I could still be called as a witness or required to turn over any related documents or notes that I keep. Please note also that **I am required to report all other forms of prohibited discrimination or harassment to the university administration.**

Mandatory Reporting of Child Abuse

UO employees, including faculty, staff, and GEs, are mandatory reporters of child abuse. This statement is to advise you that your disclosure of information about child abuse to the instructor may trigger my duty to report that information to the designated authorities. Please refer to the following links for detailed information about mandatory reporting: [Mandatory Reporting of Child Abuse and Neglect](#).

Safe Ride

541-346-7433 ext 2

pages.uoregon.edu/saferide

Safe Ride is an **assault prevention shuttle** that works to provide free, inclusive, and accessible alternatives to traveling alone at night for **UO students, faculty, and staff.**

We are a schedule-ahead service and riders can (1) call once we open to schedule a ride with a dispatcher or (2) leave a voicemail on the day of their ride request. We do not call riders ahead of time to confirm due to capacity constraints, but riders are always welcome to call us to double-check that their ride was scheduled. We are a feminist, 'for-the-students/by-the-students' organization and operate out of the Women's Center in EMU 12F.

Operating hours:

Spring term	Sunday - Thursday 7p - midnight Friday + Saturday 7p - 2a
Summer term	Sunday - Thursday 9p - midnight Friday + Saturday 9p - 2a
Fall/Winter term	Sunday - Thursday 6p - midnight Friday + Saturday 6p - 2a

Policy and rules:

1. We are a **schedule-ahead service**, we **do not call ahead**, and we can only wait for riders for 5 minutes at their pick-up time and location.
2. We only give rides to groups of **3 or less** to prioritize groups that are at higher risk.
3. We are a **free service** and do not accept tips.