



**BISC 325 – Genetics (Fall 2024)**

**Units: 4**

**Mon, Wed, Fri 1 PM – 1:50 PM**

**Room: Taper Hall (THH) 101**

**Instructor:** Trond Sigurdson, Ph.D.

**Office:** AHF 139

**Office Hours:** TBD (email for appointment)

**Contact Info:** sigurdse@usc.edu

**Teaching Assistant:** Luke Genutis, genutis@usc.edu

### **Course Description**

The aim of this course is to introduce students to the fundamental aspects of genetics, from the molecular level to the level of the organism and populations.

### **Learning Objectives**

- \* Fundamentals of gene structure, function, and transmission
- \* Methods of genetic manipulation
- \* Systems genetics
- \* Genetic analysis of populations and evolution

**Prerequisite(s):** Biological Sciences 120/121 and 220/221 (the First-year Biology sequence)

Permission of instructor can be requested if you have not met the prerequisites.

**Recommended Preparation:** Familiarity with basic chemistry and physics is assumed. Facility with algebra is recommended.

### **Course Notes**

- 1) Short quizzes will be administered in section most, if not all, weeks. Each quiz will be worth an equal portion of the 10% of the course credit resulting from quizzes. No makeup quizzes will be administered, so section attendance is critical.
- 2) Exam dates are firm. There are no makeup exams in the course. Performance on the final may be prorated to substitute for a missing midterm exam, if an excuse considered valid by faculty is presented in a timely fashion. An acceptable written excuse or documentation must be provided to the faculty. The final exam will be administered only on the date and time set by the University.
- 3) Midterm exams will be returned to students by the TAs during discussion section. The final examination will not be returned but will be retained for one semester by the faculty.
- 4) Regrades: If you think an answer you have provided was graded incorrectly or if there is an arithmetic error, you may seek a regrade. You must provide a written explanation of why you think your answer was graded incorrectly. Regrade requests are to be submitted to your TA. If a regrade is agreed upon, then the ENTIRE EXAMINATION may be subject to a regrade. Your grade may therefore go up, go down, or remain the same. Regrade requests must be received within one week of when the exam key is posted for midterms, or by the second week of classes the following semester for the final exam.
- 5) No special assignments for extra credit are permitted.
- 6) Academic integrity policies of the University will be strictly followed. Infractions can result in severe penalties. There may be assigned seating for exams. No student may be admitted to an exam after the first student has left the exam.
- 7) It may be necessary to make adjustments to the syllabus during the semester. Check the course web site or class announcements on Brightspace for updates. Exam dates will not be changed.
- 8) Any questions or concerns regarding these policies should be addressed to the faculty.

**Textbook:**

**Introduction to Genetic Analysis.** 12th Edition. A. Griffiths, J. Doebley, C. Peichel, D. Wassarman.  
Published by W.H. Freeman and Company

Schedule of lecture topics (subject to modification)

Week	Lecture topics	Readings
<b>1</b> Aug 26- Aug 30	Introduction to Genetics Single-Gene Inheritance	Chapter 1, 2
<b>2</b> Sep 02- Sep 06	<b>Sep 2, Labor Day, no lecture</b> Independent Assortment of Genes	3
<b>3</b> Sep 09- Sep 13	Mapping Eukaryote Chromosomes by Recombination	4
<b>4</b> Sep 16- Sep 20	Gene Interaction	5
<b>5</b> Sep 23- Sep 27	Genetics of Bacteria and Viruses	6
<b>FRI Sep 27</b>	<b>MIDTERM 1</b>	
<b>6</b> Sep 30- Oct 04	DNA Structure and Replication	7
<b>7</b> Oct 07- Oct 11	RNA: Transcription, Processing, and Decay <b>Oct 10-11 Fall Recess, no lectures</b>	8
<b>8</b> Oct 14- Oct 18	Proteins and Their Synthesis	9
<b>9</b> Oct 21- Oct 25	Gene Isolation and Manipulation, PCR CRISPR-CAS	10
<b>10</b> Oct 28- Nov 01	Gene Expression, Bacterial, Eukaryotes Genetic Control of Development	11, 12 13
<b>FRI Nov 01</b>	<b>MIDTERM 2</b>	
<b>11</b> Nov 04- Nov 08	Genomes, genomics Mutations	14 15
<b>12</b> Nov 11- Nov 15	<b>Nov 11, Veterans Day, no lecture</b> Transposons, Large scale mutation	16-17
<b>13</b> Nov 18- Nov 22	Population genetics	18
<b>14</b> Nov 25- Nov 29	Inheritance of complex traits <b>Nov 27-29, Thanksgiving, no lectures</b>	19
<b>15</b> Dec 02- Dec 06	Evolution, phylogenetics	20
<b>Dec 18</b>	<b>FINAL EXAM:11am</b>	

**Web Site:** Course materials and announcements will be posted to Brightspace. You are responsible for checking the website

## Grade Breakdown

Assignments	Points	% of total
Quizzes (in Discussion sessions)	50	10
Midterm 1	150	30
Midterm 2	150	30
Midterm 3	150	30
<b>TOTAL</b>	<b>500</b>	<b>100%</b>

The overall scores will be added, and the highest scoring student will be considered 100%, others will be graded according to the percentage of the highest score.

### Grading Scale (% of highest score)

A	95-100
A-	90-94
B+	87-89
B	83-86
B-	80-82
C+	77-79
C	73-76
C-	70-72
D+	67-69
D	63-66
D-	60-62
F	59 and below

E.g. if the highest scoring student scores 495 points total, then the B- starts at 396 points ( $495 \times 0.8$ )

## Academic Integrity

The University of Southern California is foremost a learning community committed to fostering successful scholars and researchers dedicated to the pursuit of knowledge and the transmission of ideas. Academic misconduct is in contrast to the university's mission to educate students through a broad array of first-rank academic, professional, and extracurricular programs and includes any act of dishonesty in the submission of academic work (either in draft or final form).

This course will follow the expectations for academic integrity as stated in the [USC Student Handbook](#). All students are expected to submit assignments that are original work and prepared specifically for the course/section in this academic term. You may not submit work written by others or "recycle" work prepared for other courses without obtaining written permission from the instructor(s). Students suspected of engaging in academic misconduct will be reported to the Office of Academic Integrity.

Other violations of academic misconduct include, but are not limited to, cheating, plagiarism, fabrication (e.g., falsifying data), knowingly assisting others in acts of academic dishonesty, and any act that gains or is intended to gain an unfair academic advantage.

Academic dishonesty has a far-reaching impact and is considered a serious offense against the university. Violations will result in a grade penalty, such as a failing grade on the assignment or in the course, and disciplinary action from the university itself, such as suspension or even expulsion.

For more information about academic integrity see the [student handbook](#) or the [Office of Academic Integrity's website](#), and university policies on [Research and Scholarship Misconduct](#).

Please ask your instructor if you are unsure what constitutes unauthorized assistance on an exam or assignment or what information requires citation and/or attribution.

### **AI Generators or outside help – not permitted**

This course aims to develop creative, analytical, and critical thinking skills. Therefore, all assignments should be prepared by the student working individually or in groups. Students may not have another person or entity complete any substantive portion of the assignment. Developing strong competencies in these areas will prepare you for a competitive workplace. Therefore, using AI-generated text, code, or other content is prohibited in this course, will be identified as plagiarism, and will be reported to the Office of Academic Integrity.

### **Course Content Distribution and Synchronous Session Recordings Policies**

USC has policies that prohibit recording and distribution of any synchronous and asynchronous course content outside of the learning environment.

Recording a university class without the express permission of the instructor and announcement to the class, or unless conducted pursuant to an Office of Student Accessibility Services (OSAS) accommodation. Recording can inhibit free discussion in the future, and thus infringe on the academic freedom of other students as well as the instructor. ([Living our Unifying Values: The USC Student Handbook](#), page 13).

Distribution or use of notes, recordings, exams, or other intellectual property, based on university classes or lectures without the express permission of the instructor for purposes other than individual or group study. This includes but is not limited to providing materials for distribution by services publishing course materials. This restriction on unauthorized use also applies to all information, which had been distributed to students or in any way had been displayed for use in relation to the class, whether obtained in class, via email, on the internet, or via any other media. Distributing course material without the instructor's permission will be presumed to be an intentional act to facilitate or enable academic dishonesty and is strictly prohibited. ([Living our Unifying Values: The USC Student Handbook](#), page 13).

### **Course Evaluations**

Course evaluation occurs at the end of the semester university-wide. It is an important review of students' experience in the class.

### **Statement on University Academic and Support Systems**

#### **Students and Disability Accommodations:**

USC welcomes students with disabilities into all of the University's educational programs. [The Office of Student Accessibility Services](#) (OSAS) is responsible for the determination of appropriate accommodations for students who encounter disability-related barriers. Once a student has completed the OSAS process (registration, initial appointment, and submitted documentation) and accommodations are determined to be reasonable and appropriate, a Letter of Accommodation (LOA) will be available to generate for each course. The LOA must be given to each course instructor by the student and followed up with a discussion. This should be done as early in the semester as possible as accommodations are not retroactive. More information can be found at [osas.usc.edu](https://osas.usc.edu). You may contact OSAS at (213) 740-0776 or via email at [osasfrontdesk@usc.edu](mailto:osasfrontdesk@usc.edu).

#### **Student Financial Aid and Satisfactory Academic Progress:**

To be eligible for certain kinds of financial aid, students are required to maintain Satisfactory Academic Progress (SAP) toward their degree objectives. Visit the [Financial Aid Office webpage](#) for [undergraduate](#)- and [graduate-level](#) SAP eligibility requirements and the appeals process.

#### **Support Systems:**

[Counseling and Mental Health](#) - (213) 740-9355 – 24/7 on call

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

[988 Suicide and Crisis Lifeline](#) - 988 for both calls and text messages – 24/7 on call

The 988 Suicide and Crisis Lifeline (formerly known as the National Suicide Prevention Lifeline) provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week, across the United States. The Lifeline consists of a national network of over 200 local crisis centers, combining custom local care and resources with national standards and best practices. The new, shorter phone number makes it easier for people to remember and access mental health crisis services (though the previous 1 (800) 273-8255 number will continue to function indefinitely) and represents a continued commitment to those in crisis.

[Relationship and Sexual Violence Prevention Services \(RSVP\)](#) - (213) 740-9355(WELL) – 24/7 on call

Free and confidential therapy services, workshops, and training for situations related to gender- and power-based harm (including sexual assault, intimate partner violence, and stalking).

[Office for Equity, Equal Opportunity, and Title IX \(EEO-TIX\)](#) - (213) 740-5086

Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

[Reporting Incidents of Bias or Harassment](#) - (213) 740-2500

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office for Equity, Equal Opportunity, and Title for appropriate investigation, supportive measures, and response.

[The Office of Student Accessibility Services \(OSAS\)](#) - (213) 740-0776

OSAS ensures equal access for students with disabilities through providing academic accommodations and auxiliary aids in accordance with federal laws and university policy.

[USC Campus Support and Intervention](#) - (213) 740-0411

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

[Diversity, Equity and Inclusion](#) - (213) 740-2101

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

[USC Emergency](#) - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

[USC Department of Public Safety](#) - UPC: (213) 740-6000, HSC: (323) 442-1200 – 24/7 on call

Non-emergency assistance or information.

[Office of the Ombuds](#) - (213) 821-9556 (UPC) / (323-442-0382 (HSC)

A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.

[Occupational Therapy Faculty Practice](#) - (323) 442-2850 or [otfp@med.usc.edu](mailto:otfp@med.usc.edu)

Confidential Lifestyle Redesign services for USC students to support health promoting habits and routines that enhance quality of life and academic performance.