

## BISC 325 – Genetics (Fall 2018)

### Instructors:

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### Meeting times:

<b>Lec</b>	<b>1:00-1:50pm</b>	<b>MWF</b>	<b>TA</b>
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### Overview and Course:

#### Content:

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, including:

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

#### Prerequisites:

Biological Sciences 120/121 and 220/221 (the First-year Biology sequence)  
 Biological Sciences 320, Molecular Biology (co-registration allowed)  
 Organic Chemistry 322a/325a and 322b/325b, (co-registration allowed)

Permission of instructor can be requested if you have not met the prerequisites. Familiarity with basic chemistry and physics is assumed. Facility with algebra is recommended.

**Text:** Introduction to Genetic Analysis. 11<sup>th</sup> Edition. A. Griffiths, S. Wessler, R. Lewontin, S. Carroll. Published by W.H. Freeman and Company

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

Course E-mails will be sent only to your official USC email address.

#### Course Credit:

Midterm Exam 1 33%  
 Midterm Exam 2 33%  
 Final Exam 34%

Discussion sections will be led by Teaching Assistants and will supplement and complement lectures. Review questions will be discussed in section.

The syllabus may change slightly during the semester. Exam dates are firm.

Week	Day	Date	Topics	Reading	Faculty
1	Mon	20-Aug	Introduction to genetics	Chapter 1	IE
	Wed	22-Aug	Single gene inheritance	Chapter 2	IE
	Fri	24-Aug	Mendelism, Segregation ratios	Chapter 2	IE
2	Monday	27-Aug	Multiple gene inheritance, Segregation	Chapter 2	IE
	Wed	29-Aug	Independent assortment	Chapter 3	IE
	Fri	31-Sep	Chromosomal basis of inheritance	Chapter 3	IE

3	Mon	3-Sep	<b>Labor Day-University Holiday</b>	---	---
	Wed	5-Sep	Polygenic inheritance	Chapter 3	IE
	Fri	7-Sep	Linkage mapping in eukaryotes	Chapter 4	IE
4	Mon	10-Sep	Mapping with molecular markers	Chapter 4	IE
	Wed	12-Sep	Genetic screens, inborn errors	Chapter 4	IE
	Fri	14-Sep	Genetics of bacteria and their viruses	Chapter 5	IE
5	Mon	17-Sep	Horizontal gene transfer in bacteria	Chapter 5	IE
	Wed	19-Sep	Gene interactions 1	Chapter 6	IE
	Fri	21-Sep	Gene interactions 2	Chapter 6	IE
6	Mon	24-Sep	<b>Midterm Exam #1</b>	---	---
	Wed	26-Sep	DNA structure and Replication	Chapter 7	IE
	Fri	28-Sep	DNA structure and Replication	Chapter 7	IE
7	Mon	1-Oct	RNA Transcription and Processing	Chapter 8	IE
	Wed	3-Oct	RNA Transcription and Processing	Chapter 8	SN
	Fri	5-Oct	Proteins and their synthesis	Chapter 9	SN
8	Mon	8-Oct	Proteins and their synthesis	Chapter 9	SN
	Wed	10-Oct	Prokaryotes Dominance and recessiveness	Chapter 11	SN
	Fri	12-Oct	Prokaryotes Gene interactions	Chapter 11	SN
9	Mon	15-Oct	Regulation of expression; Eukaryotes	Chapter 12	MD
	Wed	17-Oct	Regulation of expression; Eukaryotes	Chapter 12	MD
	Fri	19-Oct	Genetic control of development	Chapter 13	MD
10	Mon	22-Oct	Genetic control of development	Chapter 13	IE
	Wed	24-Oct	Genomes and Genomics	Chapter 14	IE
	Fri	26-Oct	Genomes and Genomics	Chapter 14	SN
11	Mon	29-Oct	<b>Midterm Exam #2</b>	---	---
	Wed	31-Oct	The dynamic genome	Chapter 15	SN
	Fri	2-Nov	The dynamic genome	Chapter 15	SN
12	Mon	5-Nov	Mutation, Repair, Recombination	Chapter 16	SN
	Wed	7-Nov	Mutation, Repair, Recombination	Chapter 16	SN
	Fri	9-Nov	Large Scale Chromosomal Changes	Chapter 17	SN
13	Mon	12-Nov	Large Scale Chromosomal Changes	Chapter 17	SN
	Wed	14-Nov	Population Genetics	Chapter 18	SN
	Fri	16-Nov	Population Genetics	Chapter 18	SN
14	Mon	19-Nov	Quantitative Genetics	Chapter 19	SN
	Wed	21-Nov	<b>Thanksgiving</b>	---	---
	Fri	23-Nov	<b>Thanksgiving</b>	---	---
15	Mon	26-Nov	Mutation - genetic variation - molecular evolution	Chapter 20	SN
	Wed	28-Nov	Regulatory evolution, origin of new genes	Chapter 20	SN
	Fri	30-Nov	Regulatory evolution, origin of new genes	Chapter 20	SN

**Final Exam: Wednesday, December 12, 11am - 1p.m.**

### Course Policies:

1) 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.

2) 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.

3) 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.

- 4) No special assignments for extra credit are permitted.
- 5) 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.
- 6) It may be necessary to make adjustments to the syllabus during the semester. Check the course web site or class announcements on Blackboard for updates. **Exam dates will not be changed.**
- 7) Any questions or concerns regarding these policies should be addressed to the faculty.

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

#### **Academic Conduct**

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Section 11, Behavior Violating University Standards <https://scampus.usc.edu/1100-behavior-violating-university-standards-and-appropriate-sanctions/>. Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct/>.

Discrimination, sexual assault, and harassment are not tolerated by the university. You are encouraged to report any incidents to the Office of Equity and Diversity <http://equity.usc.edu/> or to the Department of Public Safety <http://capsnet.usc.edu/department/department-public-safety/online-forms/contact-us>. This is important for the safety whole USC community. Another member of the university community – such as a friend, classmate, advisor, or faculty member – can help initiate the report, or can initiate the report on behalf of another person. The Center for Women and Men <http://www.usc.edu/student-affairs/cwm/> provides 24/7 confidential support, and the sexual assault resource center webpage [sarc@usc.edu](mailto:sarc@usc.edu) describes reporting options and other resources.

#### **Support Systems**

A number of USC’s schools provide support for students who need help with scholarly writing. Check with your advisor or program staff to find out more. Students whose primary language is not English should check with the American Language Institute <http://dornsife.usc.edu/ali>, which sponsors courses and workshops specifically for international graduate students. The Office of Disability Services and Programs [http://sait.usc.edu/academicssupport/centerprograms/dsp/home\\_index.html](http://sait.usc.edu/academicssupport/centerprograms/dsp/home_index.html) provides certification for students with disabilities and helps arrange the relevant accommodations. If an officially declared emergency makes travel to campus infeasible, USC Emergency Information <http://emergency.usc.edu/> will provide safety and other updates, including ways in which instruction will be continued by means of blackboard, teleconferencing, and other technology.