**Instructors**:


| Matthew Dean, Ph. D. | Norman Arnheim, Ph.D. | Sergey Nuzhdin, Ph.D. (course chair) |
|---|---|---|
| Office: RRI 304A | Office: RRI 319C | Office: RRI 304C |
| Office Hours: T8-9am | Office Hours: W5-6pm | Office Hours: F4-5pm |
| Office Phone: 213.740.5513 | Office Phone: 213.740.7675 | Office Phone: 213.740.5773 |
| E-mail: matthew.dean@usc.edu | E-mail: arnheim@usc.edu | E-mail: snuzhdin@usc.edu |


**Teaching Assistants**:


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|---|---|---|---|
| Jordan Eboreime | jordaneboreime@gmail.com | 626-378-5818 | Office hours: 11am-noon M |
| Lorraine Provencio | lprovenc@usc.edu | 909-289-1660 | Office hours: 10am-11am W |
| Tittu Nellimoottil | nellimoo@usc.edu | 213-458-9438 | Office hours: 11am-noon Th |


Meeting times:

| Lec | 13340R | 1:00-1:50pm | MWF | THH 101 | TA |
|---|---|---|---|---|---|
| Dis | 13347R | 08:30-09:50 | M | VKC201 | TN |
| Dis | 13348R | 08:30-09:50 | W | VKC201 | LP |
| Dis | 13341R | 09:30-10:50 | T | SOS B52 | JE |
| Dis | 13346R | 09:30-10:50 | Th | SOS B52 | TN |
| Dis | 13342R | 12:30-01:50pm | T | KAP140 | JE |
| Dis | 13343R | 12:30-01:50pm | Th | KAP140 | TN |
| Dis | 13344R | 03:30-04:50pm | M | VKC257 | JE |
| Dis | 13349R | 03:30-04:50pm | T | VKC261 | LP |
| Dis | 13345R | 03:30-04:50pm | W | VKC257 | LP |

**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 311 -or- 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. 10th 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 30%
Midterm Exam 2 30%
Final Exam 35% (5% cumulative)

Discussion Sections: 5% for quizzes.

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 |
|---|---|---|---|---|---|
| Week | Day | Date | Topics | Reading | Faculty |
| 1 | Mon | 22-Aug | Introduction to genetics | Chapter 1 | NA |
| | Wed | 24-Aug | Mendelism | Chapter 1 | NA |
| | Fri | 26-Aug | Single gene inheritance, Segregation ratios | Chapter 2 | NA |
| 2 | Monday | 29-Aug | Multiple gene inheritance, Segregation ratios | Chapter 2 | NA |
| | Wed | 31-Aug | Chromosomal basis of inherit | Chapter 3 | NA |
| | Fri | 2-Sep | Linkage | Chapter 3 | NA |
| 3 | Mon | 5-Sep | **Labor Day-University Holiday** | | |
| | Wed | 7-Sep | Linkage | Chapter 3 | NA |
| | Fri | 9-Sep | Linkage mapping | Chapter 4 | NA |
| 4 | Mon | 12-Sep | Human genetics, genetic diagnosis | Chapter 4 | NA |
| | Wed | 14-Sep | Genetic screens, inborn errors | Chapter 4 | NA |
| | Fri | 16-Sep | Genes in pathways | Chapter 5 | NA |
| 5 | Mon | 19-Sep | Intra- and intergenic interactions | Chapter 5 | NA |
| | Wed | 21-Sep | Microorganisms, bacterial transformation | Chapter 6 | NA |
| | Fri | 23-Sep | Bacteriophage, transduction | Chapter 6 | NA |
| 6 | Mon | 26-Sep | **Midterm Exam** | | |
| | Wed | 28-Sep | **Part 2**: Chapter 7: DNA structure and Replication | Chapter 7 | MD |
| | Fri | 30-Sep | Chapter 7: DNA structure and Replication | Chapter 7 | MD |
| 7 | Mon | 3-Oct | Chapter 8: RNA Transcription and Processing | Chapter 8 | MD |
| | Wed | 5-Oct | Chapter 8: RNA Transcription and Processing | Chapter 8 | MD |
| | Fri | 7-Oct | Chapter 9: Proteins and their synthesis | Chapter 9 | MD |
| 8 | Mon | 10-Oct | Chapter 9: Proteins and their synthesis | Chapter 9 | SN |
| | Wed | 12-Oct | Chapter 11: Regulation of expression; Prokaryotes | Chapter 11 | SN |
| | Fri | 14-Oct | Chapter 11: Regulation of expression; Prokaryotes | Chapter 11 | SN |
| 9 | Mon | 17-Oct | Chapter 12: Regulation of expression; Eukaryotes | Chapter 12 | SN |
| | Wed | 19-Oct | Chapter 12: Regulation of expression; Eukaryotes | Chapter 12 | SN |
| | Fri | 21-Oct | Chapter 13: Genetic control of development | Chapter 13 | SN |
| 10 | Mon | 24-Oct | Chapter 13: Genetic control of development | Chapter 13 | SN |
| | Wed | 26-Oct | Chapter 14: Genomes and Genomics | Chapter 14 | SN |
| | Fri | 28-Oct | Chapter 14: Genomes and Genomics | Chapter 14 | SN |
| 11 | Mon | 31-Oct | **Midterm Exam** | | |
| | Wed | 2-Nov | Chapter 15 The dynamic genome | Chapter 15 | SN |
| | Fri | 4-Nov | Chapter 15 The dynamic genome | Chapter 15 | SN |
| 12 | Mon | 7-Nov | Chapter 16 Mutation, Repair, Recombination | Chapter 16 | SN |
| | Wed | 9-Nov | Chapter 16 Mutation, Repair, Recombination | Chapter 16 | SN |
| | Fri | 11-Nov | Chapter 17 Large Scale Chromosomal Changes | Chapter 17 | SN |
| 13 | Mon | 14-Nov | Chapter 17 Large Scale Chromosomal Changes | Chapter 17 | MD |
| | Wed | 16-Nov | Chapter 18 Population Genetics | Chapter 18 | MD |
| | Fri | 18-Nov | Chapter 18 Population Genetics | Chapter 18 | MD |
| 13 | Mon | 21-Nov | Chapter 19 Quantitative Genetics | Chapter 19 | MD |
| | Wed | 23-Nov | **Thanksgiving** | | |
| | Fri | 25-Nov | **Thanksgiving** | | |
| 14 | Mon | 28-Nov | Chapter 20 Evolution of genes and traits | Chapter 20 | MD |
| | Wed | 30-Nov | Chapter 20 Evolution of genes and traits | Chapter 20 | MD |

**Final Exam:** Wednesday December 14 11:00 AM to 1:00 PM

## 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) Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to one of the Professors
as early in the semester as possible. DSP is located in STU 301 and is open 8:30 AM – 5:00 PM, Monday thru Friday, Phone number: 213-740-0776.

7) 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.**

8) Any questions or concerns regarding these policies should be addressed to the faculty.