

Program in Biological Sciences Biol. Sci. 393: Genetic Analysis; Spring 2015

Lectures: MWF 2:00 PM - 2:50 AM, Tech M128
Discussion F 3:00 PM - 3:50 PM, Tech M128
Exams: Midterm (May 1, 2-4 PM), Final (June 10, 3-5 PM)
Instructor: Erik Andersen, Department of Molecular Biosciences, Cook 3125,
email: erik.andersen@northwestern.edu, Office hours M 3-4 PM Cook 4123
TA: Daniel Cook, Office hours W 3-4 PM Cook 4123
Textbook: Introduction to Genetics Analysis by Griffiths *et al.* 10th edition

Course Format

This course will have lectures on Mondays and Wednesdays covering the topics outlined below. On Fridays, the class will alternate between quizzes and problem-solving sessions. Participation in lecture and Friday problem-solving sessions is required. The course will have four quizzes, four problem sets, one midterm, and a final examination.

Problem sets and quizzes

Problem sets will be distributed on Mondays nearly two weeks before the problem-solving session. Students must turn in their completed problem sets and be prepared to work through the problems in class on problem set Fridays. Problem-solving sessions are also meant to discuss questions about the lecture material. Quizzes will assess student progress through basic concepts. Students can take each of the quizzes twice to improve scores. Students will receive their graded quizzes on the following Monday lecture. The time before the next quiz date should be used to prepare for the make-up quiz and the next quiz.

Grading

Each examination is worth 120 points and will cover the preceding material from lectures, quizzes, and problem sets. Material from the previous part of the course is the most relevant for each exam and quiz, but successive exams and quizzes assume you remember concepts and methods covered earlier in the course. No make-up exams or quizzes will be given. Each quiz is worth 20 points. If you get 80% or greater on the quiz, you receive all 20 points. If you get less than 80% on a quiz the first time through, you may take the quiz again the next scheduled quiz day. If you receive less than 80% the second time through, you will receive that score for the quiz.

The breakdown for points in the course is below:

Point distribution		
Problem sets	15%	60 points (15 pts each)
Quizzes	20%	80 points (20 pts each)
Participation	5%	20 points
Midterm	30%	120 points
Final	30%	120 points

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Date	Lecture topic	Reading (pages)
Mon. March 30	Mendelian Inheritance, Basic probability, PS#1 out	
Wed. April 1	Chromosome theory, mitosis, and meiosis	
Fri. April 3	QUIZ #1	
Mon. April 6	Recombination and mapping	
Wed. April 8	Screens, selections, mutants, and dosage	
Fri. April 10	PROBLEM SET #1 Due	
Mon. April 13	Complementation, PS#2 out	
Wed. April 15	Genetic interactions: epistasis	
Fri. April 17	QUIZ #2	
Mon. April 20	Genetic interactions: enhancement and suppression	
Wed. April 22	Principles and methods of genetic analysis I	
Fri. April 24	PROBLEM SET #2 Due	
Mon. April 27	Principles and methods of genetic analysis II, PS#3 out	
Wed. April 29	Principles and methods of genetic analysis III	
Fri. May 1	MIDTERM EXAMINATION	
Mon. May 4	Developmental genetics I	
Wed. May 6	Developmental genetics II	
Fri. May 8	PROBLEM SET #3 Due	
Mon. May 11	Behavioral genetics	
Wed. May 13	Model organisms in genetics (from cells to humans)	
Fri. May 15	QUIZ #3	
Mon. May 18	Human variation and allele frequency spectrum	
Wed. May 20	Pedigrees and linkage mapping	
Fri. May 22	PROBLEM SET #4 Due	
Mon. May 25	Linkage disequilibrium and population structure	
Wed. May 27	Complex traits and GWAS	
Fri. May 29	QUIZ #5	
Mon. June 1	Epigenetics and transgenerational effects	
Wed. June 3	Genome sequencing, exome sequencing, and what do we do	
Fri. June 5	PROBLEM SET #5 Due	
June XXX	FINAL EXAMINATION	

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Any student with a disability requesting accommodations is required to register with AccessibleNU (accessiblenu@northwestern.edu; [847-467-5530](tel:847-467-5530)) and present an accommodation letter from AccessibleNU to the course instructor, preferably within the first two weeks of class. All information will remain confidential.

All work submitted for this class must be your own. Suspected violations of academic integrity will be reported to the Dean's Office. For more information on Northwestern policies on academic integrity, see <http://www.weinberg.northwestern.edu/handbook/integrity/index.html>.