

Biology 206H
Genetics (Honors section)
Course Policies, Syllabus, and Schedule
Spring 2016
Lectures MWF 8:00 AM – 8:50 PM
Katz 009

Instructors:

Dr. Saul Honigberg (Course Coordinator)

Office: BSB-115 Biological Sciences Building

Telephone: 235-2578 (emergency only)

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Office hours: after class when teaching (8:50-9:30) or by appointment

Dr. Scott Hawley

Office: The Stowers Institute

email: RSH@stowers.org

Office hours: after class when teaching (8:50-9:30)

Prerequisites: BIOL 108, BIOL 109 & CHEM 212. The course is open to students admitted to the university's Honor's program and also to selected students not in the Honor's program with permission of the instructor—the main criteria being performance in previous courses.

Textbooks:

Required:

1) Griffiths et al, (2015) **11th Edit.** Intro to Genetic Analysis. W.H. Freeman and Company, New York, NY. **Loose Leaf: ISBN-10: 1-4641-8804-1.** Hardcover: ISBN-10: 1-4641-0948-6.

Useful publisher's website to accompany the textbook

<http://bcs.whfreeman.com/iga10e/>

Optional:

2) Hawley & Walker (2003) Advanced Genetic Analysis. Blackwell Publishing, ISBN-1-4052-0336-1 paperback

AGA will be used extensively in the course, but purchase of the textbook is optional since all readings from this book will be available on the website.

UMKC Course Website

<http://blackboard.umkc.edu/> Use your UMKC email username and password. This website will include (i) syllabus, (ii) selected figures from lectures (iii) recommended reading assignments (iv) exam keys, (v) posted grades and other material.

COURSE DESCRIPTION AND OBJECTIVES:

Genetics is the study of inherited traits, and especially the study of genes, the elements that transmit these traits. In this course, the patterns and mechanisms of gene inheritance will be studied with a primary focus on the molecular mechanisms by which genes function and by which they change over time. A second focus will be on the uses of genetics to investigate biological processes. The goal of the course is to provide a broad introduction to the fundamental concepts underlying the science of genetics and the broad importance of genetics to biological research and to society. Students will often be asked to think creatively, for example in designing experiments.

This is an Honor's section of Genetics, with a much smaller class size than the regular section. The course was developed to challenge students and to provide an opportunity for interested students to have a deeper education in genetics. In particular, the course has a focus on in-class discussions and on projects including writing assignments outside of class. These foci are designed to encourage the development of scientific reasoning.

Student Learning Objectives:

Students should be able to:

- Explain the fundamental genetic concepts that underlie inheritance of traits, gene expression, genetic engineering, and evolution
- Critically evaluate how genetic data is used to investigate biological processes and reach conclusions
- Propose hypotheses to explain genetic data & design experiments to test these hypotheses
- Articulate the impact of genetic information on human health and disease

Exams:

There will be six exams given, each will count 12.5% of the final grade. The sixth exam is given during final exam week, but will cover only section 6 of the course. The approximate point range for each letter grade will be announced after grading of each exam. *All exams will be on scheduled date, except when exams are "take home"; in these cases, a lecture may take place on the exam date.*

Students cheating on exams or other assignment will be assigned a zero for that exam/assignment and may suffer additional academic consequences.

STUDENTS MUST TAKE ALL 6 EXAMS, ALL EXAMS COUNT TOWARD FINAL GRADE

Assignments: Out-of-class assignments, including papers & posters, and in class assignments, including quizzes, will total 20% of the total grade. Assignments may be placed on the Blackboard site (<http://sbs.umkc.edu/bio206/index.html>) or handed out in class. Quizzes may be unannounced. Assignments may be individual or group assignments.

Class Participation:

Much of the course is based on classroom discussion, and for this reason thoughtful reading of course material by each student prior to class is essential. Participation in class discussions will count for 5% of final grade. Class attendance is mandatory, and any rare missed lectures must be adequately explained.

Missed Exam Policies:

Participation in certain university-sponsored events, such as athletic events, may require a student to take an exam early. In these cases, the student must present verifiable, written notification from a university office to their professor at least two weeks in advance of the exam.

If a student misses an exam, the repercussion for the student's grade will depend on the reason for missing the exam as follows:

- a) If the student has a verifiable, written note from a health professional that the student is too ill to take an exam or a verifiable, written note from a health professional or funeral director that indicates that a family emergency prevented the student from taking the exam, then the student may take a make-up exam. Fraudulent excuses are considered cheating, and the student will receive a 0 for the exam and may suffer additional academic consequences.
- b) If student misses an exam for any other reason, the exam will be dropped, and the student's final grade will be based on the other exams plus homework minus one letter grade. For example, if the average of the other grades is a B, then the student will receive a C for the course.

Regardless of the reason, only one dropped exam is possible.

Policy statement:

Students must notify the instructor within three (3) days of the answer key posting of any possibly errors that require review.

Students who have concerns about this course should consult first with the instructor, and if not resolved at this level then through the course coordinator (if not the same). Grade appeals should proceed through the common syllabus policy described below.

Evaluations:

Evaluation of the instructor will be conducted during the last two weeks of the semester

Administrative Drop Policy:

A student may be administratively dropped from the class roster if the student does not attend any of the class periods during the first week of classes (or equivalent) without notifying the class instructor. A student is entitled to appeal the administrative drop decision, based on compelling reasons, to the Head of the Division of Cell Biology, Dr. Marilyn Yoder, room 114 Biological Sciences Building. The appeal must be in writing and occur before the beginning of the third week of classes (or equivalent).

Schedule:

<u>Date</u>	<u>Topic</u>	<u>Instructor</u>
Wed. Jan. 20	Intro to course, AGA Chapt 1: Mutation	Honigberg
Fri. Jan. 22	AGA Chapt 2: Mutant Hunts	Hawley
Mon. Jan. 25	AGA Chapt 2: Mutant Hunts	Hawley
Wed. Jan. 27	AGA Chapt 2: Crosses and Gene Assortment	Hawley
Fri. Jan 29	AGA Chapt 3: Complementation	Hawley
Mon. Feb. 1	AGA Chapt 3: Complementation	Hawley
--- end of section 1---		
Wed. Feb.3	Exam on Section 1	Hawley
Fri. Feb 5	AGA Chapt 4: Suppression	Hawley
Mon Feb. 8	AGA Chapt 4: Suppression	Hawley
Wed. Feb. 10	AGA Chapt 4: Suppression	Hawley
Fri. Feb. 12	AGA Chapt 5: Epistasis and Mosaics	Hawley
Mon Feb. 15	AGA Chapt 5: Epistasis and Mosaics	Hawley
Wed Feb. 17	AGA Chapt 6: Fine scale mapping	Hawley
Fri. Feb. 19	AGA Chapt 6: Fine scale mapping	Hawley
--- end of section 2---		
Mon. Feb. 22	Exam on Section 2	Hawley
Wed. Feb. 24	AGA Chapt 7: Meiotic Recombination	Hawley
Fri. Feb. 26	AGA Chapt 7: Meiotic Recombination	Hawley
Mon. Feb. 29	AGA Chapt 8: Meiotic Segregation	Hawley
Wed. Mar. 2	AGA Chapt 8: Meiotic Segregation	Hawley
Fri. Mar. 4	Genetics of Cancer: Theory and Treatments	Hawley
Mon. Mar. 7	Genetics of Cancer: Theory and Treatments	Hawley
--- end of section 3---		
Wed. Mar. 9	Last Hawley lecture	Hawley
Fri. Mar. 11	Exam on section 3	Hawley
Fri. Mar. 11	Last day to withdraw without assessment	
Mon. Mar. 14	IGA Chapter 10 Recombinant DNA	Honigberg
Wed. Mar. 16	IGA Chapter 10 Recombinant DNA	Honigberg
Fri. Mar. 18	Synthetic Biology/iGEM (supp material)	Honigberg
Mon. Mar 21	IGA Chapt 14 Reverse genetics	Honigberg
Wed. Mar 23	IGA Chapt 14 Reverse genetics	Honigberg
Fri. Mar 25	Supp. Material Reverse Genetics	Honigberg
Mar. 26-Apr. 3	-----SPRING BREAK-----	
--- end of section 4---		
Mon. Apr. 4	Exam on section 4	Honigberg
Wed. Apr. 6	IGA Ch. 11 Gene expression: the operon as model	Honigberg
Fri. Apr. 8	IGA Ch. 11 Regulation of gene expression, eukaryotes	Honigberg
Mon. Apr. 11	Supp Material Regulation of gene expression, eukaryotes	Honigberg
Wed. Apr. 13	IGA Ch. 13 Gene expression during development	Honigberg
Fri. Apr. 15	IGA Chapter 17 Lg. Scale Chr Change: Gene Dosage	Honigberg
Fri. Apr. 15	Last day to withdraw (with assessment)	

Mon. Apr. 18	IGA Chapter 17 Lg. Scale Chr Change: Gene Dosage	Honigberg
Wed. Apr. 20	IGA Chapter 17 Lg. Scale Chr Change: Gene Dosage	Honigberg
--- end of section 5---		
Fri. Apr. 22	IGA Chapter 17: Genomes and Transposition	Honigberg
Mon. Apr. 25	Exam on Section 5	Honigberg
Wed. Apr. 27	IGA Chapter 17: Genomes and Transposition	Honigberg
Fri. Apr. 29	IGA Chapter 18 Population Genetics	Honigberg
Mon. May 2	IGA Chapter 18 Population Genetics	Honigberg
Wed. May 4	IGA Chapter 19 Quantitative Genetics	Honigberg
Fri. May 6	IGA Chapter 19 Quantitative Genetics	Honigberg
Mon. May 9	Final Exam 8-10 am	Honigberg