

HUMAN GENETICS

GENETICS 340

SPRING 2015

INSTRUCTOR:**Dr. Jack R. Girton**

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By e-mail at any time

Text: Human Heredity, principles and Issues by Michael Cummings, 10th edition. Additional readings will be placed on the Gen 340 Blackboard site.

In this course we will review a number of subjects: (1) the composition and organization of the normal human genome, (2) some human genetic abnormalities and what they have taught us about the role of genes in human health and development, (3) some important ethical questions recent scientific advances have raised, which our society is still grappling with, (4) some of the techniques used in modern human genetic investigations. Our goal is to not just learn facts, but to also learn how questions are framed, how hypotheses are developed, how experiments are designed, how data is analyzed: in short, how the science of genetics works.

Lectures will be recorded and will be posted in the mp4 format on the class Blackboard site each week, along with copies of the PowerPoint notes used in the class.

GRADES: Grades will be based on a combination of exams and problem sets. The exams and problem sets are take-home with an open book format. Each assignment (problem set or exam) will be posted on the class Blackboard site several days before the due date listed in the syllabus. Your answers can be posted to the secure assignments folder on the class Blackboard site or sent directly to me as email attachments. The exam questions will require thought and explanation and will focus on your writing ability as well as of your knowledge of the science. The problem sets will focus on analysis, calculations, and problem solving. It is very important that you keep up with the suggested time line. While I encourage students to study together, the work handed in must be your own.

First exam	100 pts
Second exam	100 pts
Final part1	100 pts
Final part2	100 pts
Problem sets	200 pts

The final course grade will be based on a total of 500 points, counting your problem set scores and 3 of your best 4 exam scores. Each part of the final counts as an exam. Part 1 covers the last part of the course and part 2 is comprehensive. I grade on a standard scale: (A = 90% - 100%, B = 80% - 89%, C = 65% - 79%, D = 55% - 64%, F = below 55%), not a curve, so students are not competing against each other for grades.

Subject	Lecture	Chapter	Date
Introduction: Overview and History	1	1	Jan. 13
Cells and cell division	2	2	Jan. 15
Mendelian inheritance in man	3	3	Jan. 20
Pedigree analysis	4,5	4	Jan. 22, 27
Problem set 1			Jan. 30
Extra-nuclear inheritance	6	4	Jan. 29
Traits with complex inheritance	7,8	5	Feb. 3, 5
Exam 1			Feb. 13
Human Chromosomes	9	6	Feb.10
Cytogenetics	10, 11	6	Feb. 12, 17
Human development and sex determination	12, 13	7	Feb. 19, 24
Problem set 2			Feb. 27
DNA and genome analysis		14	8 Feb. 26
Gene structure and function	15	9	Mar. 3
The molecular basis of disease	16	10	Mar. 5
Metabolism and molecular medicine	17	10	Mar. 10
Mutation and HIV	18	11	Mar. 12
Exam 2			Mar. 13
Genetic technology: Cloning	19	13	Mar. 24
The genetics of cancer	20, 21	12	Mar. 26, 31
Biotechnology and society	22	14	Apr. 2
Genomics	23	15	Apr. 7
Problem set 3			Apr. 10
Personalized medicine	24	15	Apr. 9
Gene therapy	25	16	Apr. 14
Screening for disease	26	16	Apr. 16
Genetic counseling	27	16	Apr. 21
Problem set 4			Apr. 24
Immunogenetics and behavior	28	17, 18	Apr. 23
Genetics of populations	29	19	Apr. 28
Eugenics and human evolution	30	19	Apr. 30
Final exam			May 8