

Genetics, Evolution and Society

Spring 2007

Biology 340/Cell and Molecular Biology 351

Instructor: D. Haymer

Office hours: Monday through Friday 10:30 to 11:30 or by appointment

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Welcome. I want this course to provide you with an understanding of things happening in the area of Genetics. Right now, many things are happening. We will look closely at the scientific and technological advances in cloning, gene therapy, gene testing and other gene based technologies to see how they are having a major impact on the practice of medicine and society in general. We will also look at ethical issues that arise from these technologies. One of my goals is to have us discuss ethical issues from an *informed* perspective. This means that in addition to talking about the issues, we will spend a fair amount of time looking at the technologies and concepts behind the issues to find out what is real and what is not.

Reading material. There is no book for you to purchase, however you will receive a number of printed materials during the course of the semester that you will be expected to read. Attending class each scheduled day is also very important! You will not be graded on attendance, but exams will heavily emphasize material covered in class.

Exams and grades. My overall priority for the course is to have you learn some interesting and useful things. However some sort of evaluation is necessary, and ultimately I will have to assign a grade for each of you. Grades will be based on exams (2 @ 25% each), homework assignments (25%) and a final paper (25%). The exams will have multiple choice and short answer questions. Homework assignments will be given out at various times during the semester. Late homework assignments will be penalized 10% of the possible points for each day late. The final paper will be on a topic of your choice, decided on in consultation with the instructor. For the paper, you must have me approve your topic by **March 8**. You may submit a rough draft for my comments, but this will be accepted **no later than April 10**. The final paper will be due **May 1**. **Please note: Late final papers will not be accepted.**

Overall, the course will be organized into three major parts as shown below.

- Part I How did I become the person that I am? This will include looking at how you got the genes you have, how genes may be passed on to future generations, what genes are made of, what genes do for us and the role of the environment in shaping us.
- Part II What can happen with genes? This part of the course will cover the genetic basis of mutations, genetic diseases and other abnormalities.
- Part III Where are we going? In this part of the course we will look at some applications of genetic information such as genetic testing, DNA fingerprinting, pharmacogenomics, gene therapy and GM (genetically modified) food.

Date _____ Topic _____

Part One: How did I become the person that I am?

1/9	Course introduction, general genetic issues
1/11	Around the human life cycle
1/16, 1/18	How did I get the genes that I have?
1/23	What is normal anyhow?
1/25	The role of the environment
1/30	Fertilization, development, stem cells
2/1	Twins
2/6, 2/8, 2/13	What are genes, how do they work, and what do they do for me?
2/15	The human genome project, the hapmap project
2/20	Genes in populations
2/22	Evolution
2/27	Exam I

Part Two: What can happen with genes?

3/1 and 3/6	Mutations and “simple” genetic disorders
3/6	DEADLINE FOR APPROVAL OF RESEARCH TOPIC
3/8 and 3/13	“Complex” genetic disorders
3/15	Cancer genes
3/20	Genetic testing, informed consent
3/22	Genetic counseling
3/27 and 3/29	Spring break
4/3	HIV and the immune system
4/5	Manipulating genes
4/10	Paternity testing, DNA fingerprinting, human identification
4/10	DEADLINE FOR SUBMISSION OF ROUGH DRAFT

Part Three: Where can we go with genes?

4/12	PGD and gender selection
4/17	Gene therapy, genetically modified organisms
4/19	Exam II
4/24	Cloning humans (and other organisms)
4/26	Nutrigenomics, pharmacogenomics
5/1	Future ethical issues
	DEADLINE FOR SUBMITTING FINAL PAPER (Late papers will not be accepted)