

**Mammalian Molecular Genetics**  
**3 credits**  
**BMS663** **Section 9139**  
**Spring 2009**

**Course Director:** Michele Caggana, Sc.D., FACMG, Assistant Professor in Biomedical Sciences, Phone: Biggs Labs 473-3854  
em: mxc08@health.state.ny.us

*No set office hours, contact the course director for an appointment.*

**Class meets:** Mon. & Wed. 11:00-12:30 AM at CMS 5112, unless otherwise indicated

**Learning Objective:** To understand all facets of mammalian genetics with an emphasis on human disease.

- The student will learn about the methods for detecting chromosomal and molecular genetic disease via disease-specific/system-specific topics, including a comparison of genetic screening programs and the efficacy of screening tests.
- The student will be given an overview of population genetics, specifically how genes move through a population and how they maintain equilibrium.
- The student will learn about neuronal disease and diseases associated with mitochondrial dysfunction.
- The students will learn about cancer genetics and the pathways by which normal function of cells is disturbed leading to cancer.
- The student will learn about medical genetics, how it is practiced, and by an exercise in ethics will explore issues related to genetic testing.
- The student will learn about assisted reproductive medicine and the ethical issues related to new technologies, including unexpected outcomes from this revolution in reproductive medicine.

**Course Description:** This course will cover topics related to the structure, function and mapping of traits in genome. It also covers areas of clinical human genetics including specialties in the genetics area such as cytogenetics, neurogenetics, and medical genetics.

**Textbook:** Genetics in Medicine 7<sup>th</sup> Edition, edited by Nussbaum, McInnes, and Willard, 2007 is a good general reference book.

**Prerequisites:** A basic understanding of molecular biology, genetics, and biochemistry, fulfilled by taking BMS500 and BMS 504. This is a second year course and is not designed to replace the first year requirements.

**Grading:** The course is graded A-E.

1. You will be assigned homework throughout the semester. This may involve problems or papers to be discussed in class. You will have 1 assignment for the Personalized Medicine lecture, and 1 assignment for Ethics. Some instructors may assign papers for you to read and discuss. These assignments and participation are 30% of your grade.
2. For the mid-term grade, you will be asked to pick a genetic disease and write a 5-page summary of the disease describing the symptoms, treatment, frequency, mechanism, etc. from the perspective of a parent of a child with the disorder. You will also prepare a 25-minute PowerPoint presentation to present for that day's class. The paper is due the same day. Both of these assignments will account for 40% of your grade.
3. The final will be a cumulative take-home exam. It will be distributed via email on May 4. We will not meet May 7 but you may bring your laptop and work on it during the regular class time. It is due in my office by 9AM on Monday, May 11; you may email the exam to me. The final is 30% of your grade.

**Attendance:** Not mandatory, but will be taken into account for participation. You are responsible for all materials covered in class and assigned readings.

## SCHEDULE OF LECTURES

LECTURE	DAY	DATE	MONTH	TITLE	INSTRUCTOR
1	Wed	21	<b>Jan</b>	Genome Organization	Dr. Caggana
2	Mon	26	Jan	Inheritance	Dr. Caggana
3	Wed	28	Jan	Mapping	Dr. Herron
4	Mon	2	<b>Feb</b>	Mapping	Dr. Herron
5	Wed	4	Feb	Genomics	Dr. Tenenbaum
6	Mon	9	Feb	Genomics	Dr. Tenenbaum
7	Wed	11	Feb	Complex Traits	Dr. Symula
8	Mon	16	Feb	<b>NO CLASS</b>	
9	Wed	18	Feb	<b>NO CLASS</b>	
10	Mon	23	Feb	Complex Traits	Dr. Symula
11	Wed	25	Feb	Cytogenetics	Dr. Caggana
12	Mon	2	<b>Mar</b>	Cancer Genetics	Dr. Schneider
13	Wed	4	Mar	Pharmacogenetics	Dr. Ding
14	Mon	9	Mar	Genetic Epidemiology	Dr. Moslehi
15	Wed	11	Mar	Neurogenetics	Dr. Payami
16	Mon	16	Mar	<b>MID TERM EXAM</b>	Dr. Caggana
17	Wed	18	Mar	Population Genetics	Dr. Payami
18	Mon	23	Mar	Population Genetics	Dr. Payami
19	Wed	25	Mar	Imprinting	Dr. Gray
20	Mon	30	Mar	Genomic Technologies	Dr. Ryan
21	Wed	1	<b>Apr</b>	Medical Genetics	Dr. Caggana
22	Mon	6	Apr	Biochemical Genetics	Dr. Caggana
23	Wed	8	Apr	<b>NO CLASS</b>	
24	Mon	13	Apr	<b>NO CLASS</b>	
25	Wed	15	Apr	Mitochondrial Genetics	Dr. Adams
26	Mon	20	Apr	Newborn Screening	Dr. Caggana
27	Wed	22	Apr	PGD/IVF	Dr. Caggana
28	Mon	27	Apr	Personalized Medicine	Dr. Caggana/class
29	Wed	29	Apr	Ethics	Dr. Caggana/class
30	Mon	4	<b>May</b>	Ethics	Dr. Caggana/class
31	Wed	6	May	<b>FINAL EXAM</b>	Dr. Caggana