

MOLECULAR GENETICS 500

Winter 2006

M W F 1:30-2:48 PM

Rm 0021, Lazenby Hall

Instructor: Gregory C. Booton, PhD.
Depts. of Molecular Genetics & EEOB
388 Aronoff Laboratory
318 W. 12th Ave.

Contact Information:

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Phone: 614-292-4570

Office Hours (Wi06): Mon: 10:30-11:30am; Wed: 3:00-4:00pm

Graduate Teaching Assistants:

The GTAs will hold office hours twice a week. They will help to answer questions about the material and to help solve assigned end of chapter problems. For specific questions regarding the lectures please contact the instructor during office hours.

Hongtaou Jia: jia.10@osu.edu

Office hour: Thurs. 3:00-5:00pm, 941 Biological Sciences Building

Casey Jowdy: jowdy.1@osu.edu

Office hours: Tues. 9:30-10:30am and Thurs. 3:00-4:00pm, Rightmire Hall, room 125, call first from the phone in the front foyer to get in the building. The number is 292-5107.

Tse-Chun Kuo: kuo.85@osu.edu

Office hours: Fri. 3:00-5:00 pm, please email for exact location.

Ching-Hui Yang: yang.1030@osu.edu

Office hours: Tues. 1:30-3:30pm, 211 Biological Sciences Building.

Course Description:

This course will provide students with a robust survey of the principles of genetics, including molecular genetics, transmission genetics, developmental genetics, non-chromosomal genetics, and the genetics and evolution of populations. In addition, recent advances in genetics and the

implications/effects of these advances on science, business, politics, and society in general are addressed throughout the course.

General Information:

You are responsible for materials in chapters covered in lecture unless otherwise noted in class, and for material covered in lectures, even if material is not in the textbook. This course moves at a very rapid rate and it is very important to your success that you do not fall behind.

Practice problems will be assigned for each chapter. These practice problems cover material that is similar to the type of material that will be covered on the exam.

The exam will be a mixture of multiple choice and short answer. I will not stress rote memorization of all the details of these chapters, but you should know some of the important facts. I will let you know what specific facts I feel are important during lectures. With that in mind, your presence at lectures will be directly reflected in your performance on the midterms and final. The concepts that I will try to stress are hypothesis testing and question formulation, and how researchers in the past have addressed questions, and how the knowledge that they obtained by these experiments led to further questions. It is a process that continues today, and one that all of you will employ to some greater or lesser degree in your future scientific careers.

Grading:

Your final grade will be based on a total of 400 available points in this course. This will be made up of 2 Midterms worth 120 points each (each midterm is 30% of final grade) and 1 comprehensive Final of 160 points (40% of final grade), which will comprise 40 points worth of questions from the first portion of the course, 40 points from the second section of the course, and 80 points from the final portion of the course.

NOTE: Student identification cards will be required at all exams. All students must hand in their exam by the end of the exam period, there will be no extra time for students that arrive late. The format of the exams will be multiple choice, short answers, and problem solving questions similar to the assigned problems at the end of chapters. Midterms will be given **only** at the scheduled times. **NO** makeup examinations will be given. If you miss a **single** midterm for **ANY** reason, the corresponding segment of the comprehensive final exam will be used to calculate a missed midterm grade (eg., $40 \times 3 = 120$) and will also contribute 40 points to your final exam score. You must **NOT** miss more than one midterm; this will result in an

automatic **E** for the course. The final exam must be taken to receive a grade in this course. If you miss the final, you will be given an incomplete (**I**) for the course. University regulations will be followed with respect to absence at a final exam. That is, you will be allowed to make up the incomplete grade **only** after providing documentary proof that you missed the exam because of severe illness. Otherwise, your grade will be based on the points received, counting the final exam as zero. Students are expected to abide by the Code of Student Conduct as outlined in the University Student Handbook.

Carmen:

Powerpoint presentations, assigned problems for chapters, and keyword study guides for chapters will be available at the Carmen website. Each student enrolled in MG500 will have access to the website for the course, and you should check there for handouts, powerpoint files, and announcements about the course on a regular basis. You are responsible for obtaining the powerpoint handouts **BEFORE** lecture. Handouts will not be available in lecture. The lectures moves rapidly, based on the assumption that the students have the powerpoint handouts, so please print them out ahead of class time. If you have not used Carmen before please visit <http://telr.osu.edu/carmen-help/students/guide.html> for more information about student usage of Carmen.

Textbook:

**Concepts of Genetics. William S. Klug & Michael R. Cummings, 8th Edition. 2006. Prentice Hall
ISBN 0-13-191833-8**

Additional Reference Materials:

Genes VIII. Lewin, B. 2000. Oxford Univ. Press

Genetics: Analysis of Genes and Genomes. Hartl, D.L., & Jones, E.W. 6th edition. 2000. Jones and Bartlett

Genetics: From Genes to Genomes. Hartwell, et al. 2st Edition, 2000. McGraw-Hill Co.

Dancing Naked in the Mind Field. Mullis, K. 1998. Pantheon Books, NY

These books are on reserve in the Biological Sciences-Pharmacy Library

Tentative Syllabus
(Schedule subject to change)

<u>DATE</u>		<u>Topic</u>	<u>Chapters</u>
Weds., Jan.	4	Introduction, Mitosis	1, 2
Fri	6	Mitosis, Meiosis	2, 3
Mon.	9	Mendelian Genetics	3
Wed.	11	Mendelian Genetics (cont)	3
Fri.	13	Extensions of Mendelian Genetics	4
Mon.	16	HOLIDAY- no class	
Wed,	18	Extensions (cont), Quantitative Genetics	24
Fri.	20	Linkage analysis	5
Mon.	23	MIDTERM I (through 1/20/06 material)	
Wed.	25	Sex determination/sex chromosomes	7
Fri.	27	Extrachromosomal inheritance	9
Mon.	30	Developmental genetics	23
Wed., Feb.	1	DNA structure and analysis	10
Fri.	3	DNA structure and analysis (cont)	10
Mon.	6	DNA Replication	11
Wed.	8	DNA Replication (cont)	11
Fri,	10	Genetic code	13
Mon.	13	Transcription	13
Wed	15	MIDTERM II (through 2/13/06 material)	
Fri.	17	Translation	14
Mon.	20	Gene Mutation, DNA Repair	15
Wed.	22	DNA Repair	15
Fri.	24	Regulation of Gene expression	16, 17
Mon.	27	Recombinant DNA technology	19
Wed., Mar.	1	Recombinant DNA technology (cont)	19
Fri.	3	Genomics/Bioinformatics	20
Mon.	6	Model Organsims/Mutational analysis	21
Weds.	8	Population Genetics	25
Fri.	10	Population/Evolutionary Genetics	25,26
Mon. March	13	FINAL EXAM (1:30-3:18PM)	