

SYLLABUS

PRINCIPLES OF GENETICS - BSC 324

FALL 2006

INSTRUCTORS:

DR. (PATRICK) SIMON COLLIER

E-Mail: collierp@marshall.edu

Office - Science Building 390 **Phone:** 696-6111 **Research Lab:** S361B **Phone:**696-4673

Office Hours: Due to research commitments I operate an 'open door' policy rather than 'office hours'. Students are welcome to contact me through email or phone to arrange a time to discuss matters relating to the course. Students may also drop by my office or lab at anytime although I cannot guarantee to be able to spend substantial time with students who call without prior arrangement. **N.B. Students are also encouraged to visit my research lab to see how modern developmental genetic research is undertaken and to discuss ways in which they can become actively involved in my research** ('open door' policy as above).

DR. N.J. LoCASCIO

E-Mail: locascio@marshall.edu

Office - Science Building 122A **Phone:** 696-3975.

Office Hours - T 2:00 - 4:00; W 2:00 - 4:00; R 2:00 - 4:00 or by appointment. I make every effort to keep my scheduled office hours. Please be aware that sometimes I have conflicts with required meetings and cannot be present. If you need to meet it is best to e-mail me ahead of time.

Course Description: The fundamental principles and mechanisms of inheritance.

Course prerequisite: BSC 120 and 121 minimum grade C and CHM212 minimum grade C.

Lecture Specific objectives: To understand the biochemical structure and activity of genes, the organization of genes in genomes, the nature and consequences of gene mutation and the segregation of genes in families and populations.

Overall objective: To appreciate the complex relationship between gene variation (genotype) and character variation (phenotype).

Laboratory Specific objectives: To become familiar with the fruit fly *Drosophila melanogaster* as a model organism in the study of Genetics. To gain hands-on experience of traditional and molecular approaches to genetic analysis.

Overall objective: To learn to hypothesize (make informed guesses) based upon your own observations.

LECTURE: 12:30 - 1:45 T,R room S376

LABORATORY : room S 381

Section 101 9:00 - 11:50 T; Section 102 9:00 - 11:50 W; Section 103 9:00 - 11:50 R

TEXT: Essentials of Genetics, Klug and Cummings. 5th. Edition; Pearson/Prentice Hall.

COURSE WEB SITE: <http://vista.marshall.edu/webct/logonDisplay.dowebct>

LAB MANUAL: will be posted to WebCT Vista site. Students are responsible for downloading their own copies of the exercises prior to laboratory sessions. Lecture notes, any handouts, practice tests, in addition to laboratory protocols will be posted on the BSC324WebCT Vista site. Students must access this site for additional information and updates to the course throughout the semester.

COURSE POLICIES

*1. Attendance in lectures is strongly encouraged. You are responsible for any material missed by being absent. Attendance in laboratory sessions is mandatory since they can only be done the week the exercise is scheduled. Absences from exams or quizzes due to illness, death in the family, or institutional activities will be excused with the appropriate written notification to the instructor. In the case of illness, you must provide a physicians' note stating that you could not be present during the exam period for medical reasons. See Marshall University Undergraduate Catalogue - Academic Information for guidelines. <http://www.marshall.edu/ucomm/catalog/interim.htm>. Until final grades have been submitted you are expected to keep copies of all submitted and graded work (quizzes, papers etc). **No makeup exams or quizzes will be permitted without written excuse and prior notification.***

2. Academic dishonesty in any form will not be tolerated. All written assignments, quizzes, and exams are to be independent efforts of each student. Refer to Undergraduate Catalog pages 101-102. Written assignments will be submitted to the internet programme *Turnitin.com*.

3. **Grades cannot be e-mailed or given over the phone.** You must be present during lecture or lab to collect graded exams and papers.

4. Students are responsible for reading the appropriate material from the textbook. The student is responsible for reading the text material to help understand the material covered during lecture time. Practice problems are provided in the textbook and online. Questions about the reading material should be given to the instructor so it can be reviewed in class.

Each exam, including the final, will be 15% of final grade. You will be tested on lecture notes and assigned readings from text chapters. Format for the exams will be objective and some short answer essays. Laboratory performance will contribute the other 40% of your course grade. Lab grades will consist of weekly quizzes, 2 individual writing assignments, and one group project.

GRADING SCALE: 100 - 90 = A; 89 - 80 = B; 79 - 70 = C; 69 - 60 = D < 59= F

Tentative syllabus and exam schedule:

<u>Date</u>		<u>Text Chapters</u>
8/22 - 8/24	Introduction to Genetics; <i>No labs for this week.</i>	1
8/29 - 8/31	Review of Meiosis; Cell Cycle	2
9/5 - 9/7	DNA Structure; DNA Replication	10, 11
9/12 - 9/14	Chromosome Structure and DNA Sequence Organization	12
9/19	*EXAM I* <i>No labs for this week.</i>	
9/21	Genetic Code; Transcription	13
9/26 - 9/28	Translation & Proteins	14
10/3 - 10/5	Gene Mutation, DNA Repair and Transposable Elements	15
10/10 - 10/12	Regulation of Gene Expression	16
10/17 - 10/19	Recombinant DNA Technology	17
10/24	*EXAM II* <i>No labs for this week.</i>	
10/26	Mendelian Genetics	3
10/27	<i>Last day to drop class</i>	
10/31	Modification of Mendelian Ratios	4
11/2	Sex Determination and Sex Chromosomes; Quantitative Genetics	5, 6
11/7	Chromosome Mutations	7
11/9	*EXAM III* <i>No labs for this week.</i>	
11/14 - 11/16	Linkage and Chromosome Mapping; Genes and Development	8, 20
11/20 - 11/25	<i>Fall Break</i>	
11/28 - 11/30	Genetic Basis of Cancer; Genetics and Evolution	21, 22, 23
11/29 - 12/5	<i>"Dead Week"</i> catch up	
12/12	*FINAL EXAM* 12:45pm- 2:45pm	

* exams will be given back during lecture time. We do not e-mail or phone grades. If you are not present to receive your grade, or have a question regarding your academic performance, please come to instructors' office.

Principles of Genetics Laboratory

The laboratory portion of this course will contribute 40% of your total grade for the semester. This will be determined from weekly quizzes, and writing assignments.

Quizzes (10 points each x 10 exercises)	100
Attendance (5 points x 10 exercises)	50
2 (individual) writing assignments 30 points each	60
End of semester (group) report on <i>Drosophila</i> crosses	20

Quizzes will be given within the first 20 minutes of lab. If you are absent there is no make-up. The same lab exercise is offered three times each week and students can come to another section if they cannot attend their regular time.

Tentative Laboratory Schedule

Week of 8/29	lab 1 Mitosis and Cytokinesis; Meiosis
Week of 9/5	lab 2 Introduction to <i>Drosophila</i> life cycle and mutants
Week of 9/12	lab 3 Set up <i>Drosophila</i> crosses*
Week of 9/19	no labs
Week of 9/26	lab 4 Characterization of DNA and Introduction to Gel Electrophoresis and PCR
Week of 10/3	lab 5 Analysis of a Mutant Haemoglobin Gene
Week of 10/10	lab 6 Bacterial Transformation (pGlo) and Arabinose Operon
Week of 10/17	lab 7 Analyses of Transformations
Week of 10/24	no labs
Week of 10/31	lab 8 Alu Genotype and Population Genetics
Week of 11/7	no labs
Week of 11/14	lab 9 Analyses of Alu gels
Week of 11/28	lab 10 Analyses of <i>Drosophila</i> crosses

* for the remaining weeks of laboratory exercises lab groups are responsible for counting offspring and generating subsequent generations.



How teachers decide which students to call on in class