

POLICIES FOR GENETICS & EVOLUTION (BIOL 224) SPRING 2009 from Dr. Neigel

COURSE OBJECTIVE

Genetics is a cornerstone of modern biology and has led to major advances in medicine, biotechnology and basic science. *Evolution* is the most important unifying principle in biology that explains both the unity and diversity of life. In this course, you will learn about genetics and evolution and how they are interrelated. Modern genetic approaches, such as DNA sequencing, produce enormous quantities of data that can only be managed with computers. A secondary objective of this course is for you to learn how to use computers to analyze genetic data.

MATERIAL COVERED

Three main areas of genetics will be emphasized in this course: 1) Mendelian genetics; 2) regulation of gene expression, and 3) evolutionary genetics. This course assumes that you have already taken Biology 212 (Cellular and Molecular Biology), which covers DNA structure, DNA replication, transcription and translation.

EXAMS QUIZZES and GRADES

In designing exams and quizzes, I consider how much you will be expected to know in other courses at UL Lafayette and in graduate and professional schools. I've also considered standardized tests such as the GRE and MCAT. I will provide you with practice tests and/or study guides before each exam. The format of exams will vary. The first will emphasize problems that require basic math. Later exams will emphasize interpretation of data and the application of concepts.

Quizzes will be given after major subjects are covered, and together will count for 20% of your final grade. Three exams will be given, including one during finals week. Exam scores will be "curved" to bring the class average to 75. Each exam will count for 20% of your grade. The following averages will be sufficient to achieve the indicated grades:

A: 90 – 100 B: 80 – 89 C: 70 – 79 D: 60 – 69 F: below 60

COMPUTER LAB

The lab portion of this course will emphasize using computers to analyze genetic data, as well as presentation of results in lab reports and PowerPoint. Everyone who is enrolled in the lecture portion of the course must also be enrolled in a lab section. The labs will meet in room 411, Wharton Hall, and will last 1 hour and 50 minutes. Your grade for the lab will count as 20% of your final grade.

TEXTBOOK

INTRODUCTION TO GENETIC PRINCIPLES by David Hyde, McGraw-Hill, 2009.

CONTACT INFORMATION

Course handouts, notes, old exam questions, and links to other genetics sites can be found at the class website: <http://seahorse.louisiana.edu/biol224/>

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COURSE SYLLABUS¹ FOR BIOLOGY 224 – GENETICS & EVOLUTION
 SPRING SEMESTER 2009
 Dr. Joseph Neigel

| DATE | TOPIC | DATE | TOPIC |
|------|-------------------------------------|------|------------------------------------|
| 1/14 | Course Introduction | 3/11 | Eukaryotic <i>cis</i> Regulation |
| 1/16 | Mendel's Principles | 3/13 | Transcription Factors |
| 1/21 | Probability | 3/16 | Regulatory Networks |
| 1/23 | Review of Mitosis and Meiosis | 3/18 | Chromatin in Gene Regulation |
| 1/26 | Probability and Statistics | 3/20 | Post-transcriptional Regulation |
| 1/28 | Sex Linkage and Sex Determination | 3/23 | Review for Exam |
| 1/30 | Pedigree Analysis | 3/25 | Exam II |
| 2/2 | Modifications of Mendelian Patterns | 3/27 | Alleles and Genotypes Frequencies |
| 2/4 | Gene Interactions | 3/30 | Selection |
| 2/6 | Linkage and Recombination I | 4/1 | Genetic Drift |
| 2/9 | Linkage and Recombination II | 4/3 | Migration and Population Structure |
| 2/11 | Linkage Mapping | 4/6 | Quantitative Traits |
| 2/13 | Review for Exam | 4/8 | Heritability |
| 2/16 | EXAM I | 4/20 | Darwinian Evolution and Fitness |
| 2/18 | Bioinformatics I | 4/22 | Speciation |
| 2/20 | Bioinformatics II | 4/24 | Phylogenetics |
| 2/27 | Genetics of Bacteria & Phages | 4/27 | Human Evolution |
| 3/2 | Bacteria Sexual Reproduction | 4/29 | Pathogen Evolution |
| 3/4 | Lactose Operon | 5/1 | Review for Exam III |
| 3/6 | Other Operons | | |
| 3/9 | Phage Lambda | 5/7 | EXAM III (8:00 – 10:30) |

¹This is a tentative schedule, exact dates and topics are likely to change

NOTICE: A map of this floor is posted near the elevator marking the evacuation route and the Designated Rescue Area. This is an area where emergency service personnel will go first to look for individuals who need assistance in exiting the building. Students who may need assistance should identify themselves to the teaching faculty.