GENETICS 302

Course #: 34-BIOL-302
Office & hrs: EDS 215 P, 12-1, M-F
email: David.Fankhauser@uc.edu
home page: http://Biology.clc.uc.edu/Fankhauser

SYLLABUS
Winter Quarter
2008-2009

David B. Fankhauser, Ph.D.
Professor of Biology/Chemistry
U.C. Clermont College
Batavia OH 45103

COURSE OBJECTIVES FOR GENETICS 302: To learn these aspects of Genetics:

1) history of its understanding
2) Mendelian analysis and its power
3) chromosomal inheritance & mapping
4) mutations: their induction &effects
5) recombination
6) DNA structure and replication
7) transcription and translation
8) regulation of gene expression
9) modern genetics research techniques
10) social implications of genetics
11) genetics nomenclature & its etymology

REQUIRED TEXT: Griffiths, A.J.F., Wessler, S.R., Lewontin, R.C., Carroll, S. B., *An Introduction to Genetic Analysis*, 9th Ed., W.H. Freeman and Co, (2008).

REQUIRED MATERIALS FOR LAB: (Meets Tuesdays, 2:00 to 5:00)
Graph-lined Comp Notebook & Black waterproof fine-tipped pen (*i.e.*, Pilot Precise Rolling Ball V5, very fine)

OPTIONAL RESOURCE TEXT:
Borror, Donald J., *Dictionary of Word Roots and Comb'ng Forms*, Mayfield Pub., (1960).

Homework is due *on the date* in which the page and problem numbers appear in bold. Each can be worth 5 points. See handout for details of the requirements. **Quizzes** are given on Tuesdays at 4:20 (after completion of Lab).

Please fasten this calendar inside the front cover of your text and bring the text to class daily.

MONDAY	WEDNESDAY	FRIDAY
1/5 Introduction to Genetics: Milestones in its understanding 1-5, 31-37	1/7 Mendelian Analysis Elements of Probability 37-46	1/9 Chromosomes: Hereditary units Mitosis and Meiosis 47-61
1/12 Constructing pedigrees Sex Linkage **79:1,9,28 [QUIZ I, 1/13]** 61-75	1/14 Discuss quiz, Sex Linkage, concl'd Independent Assortment 89-119	1/16 χ^2 test Three point test crosses 97-99,129-143
1/19 **Martin Luther King Day** (No classes)	1/21 Chromosome Linkage and Mapping 144-165 **83:38; 122:14a,b,c; 126:46**	1/23 Allelic forms, Modified Mendelian Ratios 221-249
1/26 Modified Ratios concluded **169:1,7, 8;177:48 [QUIZ II 1/27]**	1/28 Discuss quiz, Mutant types: Selection & Induction **NOTEBOOKS DUE** 513-550	1/31 Changes in Chromosome Structure & Number 555-590
2/2 Recombination: bacteria & phage **252:2,4a&b** 181-213	2/4 Deoxyribonucleic Acid: History of its understanding 265-273	2/6 DNA: Chemical Structure 273-279
2/9 Catch Up. (And review for midterm) **[MIDTERM, 2/10]**	2/11 Midterm returned and discussed	2/13 Mechanism of Replication 279-291
2/16 What is a gene? Genetic Fine Structure 230-235	2/18 DNA Function I: Transcription 295-306	2/20 Eukaryotic RNA and its processing 306-315
2/23 DNA Function II: Translation **del prob. [QUIZ III, 2/24]** 319-345	2/25 Discuss quiz, Restriction Enzymes (Manipulation of DNA I) **NOTEBOOKS DUE** 715-725	2/27 Manipulation of DNA II: Cloning and selecting genes 725-732
3/2 Manipulation of DNA III: **NB back** Sequencing & "Fingerprinting" 732-735, 151-153, 611 (VNTR)	3/4 Gene Regulation I: The *lac* operon, a classic example 351-368	3/6 Gene Regulation II: examples & mechanisms 368-381
3/9 Mutagenesis **381:3,4 [QUIZ IV 3/10]** 513-531	3/11 Discuss quiz Repair Mechanisms 531-550	3/13 Catch-up and Review Bring in your notes and questions

3/18 **Monday**

FINAL EXAM
1:30-3:30

Assigned readings and homework (in **bold**) are to be complete prior to class on the indicated date. Grades are determined by your position on a histogram of student cumulative points (tests, quizzes, homework and lab notebooks). Midline generally marks the middle of the Bs. See *How To Take A Fankhauser Sophomore Course* for additional info.

30 Dec'08