

# GENETICS 302

Course #: 34-BIOL-302  
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**SYLLABUS**  
 Winter Quarter  
 2011-2012

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

- |   |                                  |   |
|---|----------------------------------|---|
| 1) History of its understanding         | 5) Recombination                 | 9) Modern genetics research techniques    |
| 2) Mendelian analysis and its power     | 6) DNA structure and replication | 10) Social implications of genetics       |
| 3) Chromosomal inheritance & mapping    | 7) Transcription and translation | 11) Genetics nomenclature & its etymology |
| 4) Mutations: their induction & effects | 8) Regulation of gene expression |   |

**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)

**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
1/2	1/4 Introduction to Genetics: Milestones in its understanding [Remember to water sprouts 2x daily.] 1-5, 31-37	1/6 <b>Hand out labels for root tips.</b> Mendelian Analysis Elements of Probability 37-46
1/9 <b>First: Bring in sprouts, harvest root tips.</b> Chromosomes: Hereditary units Mitosis and Meiosis 47-61 [QUIZ I, 1/11]	1/11 _____ Discuss quiz _____ Constructing pedigrees; Sex Linkage <b>79:1, 9, 28</b> 61-75	1/13 Sex Linkage, concl'd Independent Assortment [Give talk in Toledo?] 89-119
1/16 <b>Martin Luther King Day</b> (No classes)	1/18 Application of the $\chi^2$ test Three point test crosses 97-99,129-143	1/20 Chromosome Linkage and Mapping 144-165 <b>83:38; 122:14a,b,c; 126:46</b>
1/23 Allelic forms, Modified Mendelian Ratios 221-249 [QUIZ II 1/25]	1/25 _____ Discuss quiz _____ Modified Ratios concluded <b>NOTEBOOKS DUE</b>	1/27 Mutant types: Selection & Induction <b>169:1, 7, 8; 177:48</b> 513-550
1/30 Changes in Chromosome Structure & Number 555-590	2/1 Recombination: bacteria & phage <b>252:2,4a&amp;b</b> 181-213	2/3 Deoxyribonucleic Acid: History of its understanding 265-273
2/6 CATCH UP REVIEW FOR FINAL? [MIDTERM, 2/8]	2/8 Midterm returned and discussed	2/11 DNA: Chemical Structure 273-279
2/13 Mechanism of Replication 279-291	2/15 What is a gene? Genetic Fine Structure <b>Hand out deletion probs.</b> 230-235	2/17 DNA Function I: Transcription 295-315
2/20 Eukaryotic RNA and its processing <b>Del prob due.</b> [QUIZ III, 2/21]	2/22 _____ Discuss quiz _____ DNA Function II: Translation <b>NOTEBOOKS DUE</b> 319-345	2/24 Restriction Enzymes (Manipulation of DNA I) 715-725
2/27 Manipulation of DNA II: Cloning and selecting genes 725-732	2/29 Manipulation of DNA III: <b>NB back</b> Sequencing & "Fingerprinting" 732-735, 151-153, 611 (VNTR)	3/2 Gene Regulation I: The <i>lac</i> operon, a classic example 351-368
3/5 Gene Regulation II: examples & mechanisms 368-381 [QUIZ IV 3/6]	3/7 _____ Discuss quiz _____ Mutagenesis <b>381:3,4</b> 513-531	3/9 Repair Mechanisms 531-550 Catch-up and Review Bring in your notes and questions
3/12 <b>Monday</b> [Tentative] <b>FINAL EXAM</b> 1:30-3:30	Assigned readings and homework (in <b>bold</b> ) 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 <i>How To Take A Fankhauser Sophomore Course</i> for additional info. <p style="text-align: right;">23 December 2011</p>	