

RULES AND COMMENTS ON BIOLOGY 41, GENERAL GENETICS-FALL 2009

1. Texts and supplements:

Text - Hartwell, L.H., Hood, L., Goldberg, M.L., Reynolds, A.E., Silver, L.M., & Veres, R.C., *Genetics: From Genes to Genomes*, 3rd edition, hardbound ISBN 978-0073227382, paperback ISBN 978-0071102155.

e version of text:

VitalSource at <http://www.textbooks.vitalsource.com>

When an eBook is purchased from VitalSource the eBook can be downloaded to your computer. As long as you have the computer, you have the eBook.

CourseSmart at <http://www.coursesmart.com>

When an eBook is purchased from CourseSmart, you can view the full book on any computer with online access for a full year.

Solutions manual:

Nero, D. *Study Guide/Solutions Manual to accompany Genetics From Genes to Genomes*, 3rd ed., ISBN 978-0072995879.

Supplement and Problem Set:

The Problem Set (green booklet) and the Supplement (red booklet) should be purchased from the Biology Department. Cost, time, and place to be announced.

2. Two books are on reserve: Watson, J. et al. *Recombinant DNA* and Crow, J. *Genetics Notes*. The Watson book is useful for molecular methods and the Crow book for a review of basic genetics.

3. The instructors are Michelle Gaudette, Barnum 211, 617-627-2909, michelle.gaudette@tufts.edu and Eli Siegel, Dana 220A, 617 627-3193, eli.siegel@tufts.edu.

4. Class meets 1:30-2:45 on Tuesday and Thursday. The optional recitation is on Wednesday at 4:30 in Barnum 008 only on days designated in the schedule.

5. Blackboard (<http://blackboard.tufts.edu>)

Syllabus – available on Blackboard as well as on the departmental website.

Faculty – listing of office hours of instructors and teaching assistants.

Discussion board – questions that are brief can be posted on the Discussion board and will usually be answered within a day.

External links – assigned links, mostly useful animations

Tests – 2008 and 2009 tests with answers.

Slides – available in Power Point (PP) format. To print or view, click Slides on the Blackboard menu and then the set you have selected. To print, click the Office Button at the top left of the PP screen, then Print, and then Properties. On Layout, select the number of pages (slides) you want to print per sheet of paper.

Tools – be certain to check that your email address is correct.

6. Use the lecture schedule to determine when an assignment should be read.

7. Homework problems should be kept in a separate notebook. This makes it easier to review before the test. Homework assignments are **not** collected. Detailed solutions to the text problems can be found in the *Solutions Manual*.

8. Office hours of the instructor and the teaching assistants are listed on Blackboard. Use these office hours to clear up any questions about the lectures or homework problems as they arise. Do **not** wait until after the first test.
9. You are expected to have a knowledge of mitosis, meiosis, Mendelian genetics, and basic molecular biology (DNA, RNA, protein) from a college level introductory biology course. Ordinarily, Biology 41 should **not** be your first biology course at college.
10. Cell phones should be turned OFF.
11. Handouts are sometimes distributed in class. Extra handouts are placed in the bookcase in the first floor hall of Dana near the genetics bulletin board.
12. **Tests:**
 - a. You will receive a schedule of the test dates. Excluding verifiable illness or serious family emergency, all students are expected to take tests on the days that they are given. A graduate or professional school interview or test on the same day in another course is NOT a valid reason for missing a test. A grade of zero may be given for a missed test.
 - b. If you receive additional time on tests, please provide documentation ten days in advance of the first test.
 - c. Arrangements for a make-up test must be made within three school days of the missed test.
 - d. Errors in marking must be brought to the instructor's attention within four school days of the test's return to class. Put no marks of any kind on a returned test; attach a note.
 - e. No electronic device more complex than a simple calculator that cannot display graphs or text can be used during a test. No wireless device can be handled during a test.
 - f. There will be three tests with values of:

Test I -	85 points
Test II -	105 points
Test III -	125 points
 - g. Test III is scheduled for December 15 at 3:30pm. Test III is not a comprehensive final exam. It will stress the material of the last third of the course and a small number of topics from the first two thirds of the course.

BIOLOGY 41 GENERAL GENETICS FALL 2009

SCHEDULE

September	8	Mendelian genetics, probability
	10	Chi-square, Extensions to Mendelian genetics
	15	Extensions to Mendelian genetics, Mitosis
	17	Mitosis, meiosis, sex-linkage
	22	Linkage and recombination
	23	4:30, <u>Recitation</u>
	24	Linkage and recombination
	29	Bacteria, viruses
	30	4:30, <u>Recitation</u>
	October	1
6		DNA, DNA replication
7		4:30, <u>Recitation</u>
8		TEST I
15		Pathways, protein structure
20		Gene expression
22		Gene Expression
27		Bacterial genetics
28		4:30, <u>Recitation</u>
29		Bacterial genetics
November	3	Regulation in prokaryotes
	4	4:30, <u>Recitation</u>
	5	Recombinant DNA and allied methods
	10	Recombinant DNA and allied methods
	11	4:30, <u>Recitation</u>
	12	TEST II
	17	Genomics, Detection of genotypes
19	Regulation in eukaryotes	
24	Regulation in eukaryotes	
December	1	Chromosomes

- 2 4:30, Recitation
- 3 Transposable elements

- 8 Cancer
- 9 4:30, Recitation
- 10 Catch-up day

- 15 3:30, **TEST III**

p.s. = Problem set (green)

spl. = Supplement (red)

1-3 = chapter 1, problem 3

L on BB = website linked on Blackboard

Unless otherwise noted, all assignments are in Hartwell *et al.*, 3rd edition

All assigned websites are externally linked through Blackboard.

Although not assigned, you are STRONGLY urged to look at the Connections and the Solved Problems at the end of each assigned chapter in the text.

Mendelian genetics, probability, chi-square

p. 15-33; 127 (bottom, Chi-square) -131.

Problems 2-4, 2-6, 2-11, 2-13, 2-14, 2-16, 2-27, 2-29, 2-30, 2-36, 5-2

p.s. 11, 18, 103, 171, 183, 191, 279, 290

Extensions to Mendelian genetics

p. 45-68; 225 (complementation) -226

Problems 3-3, 3-5, 3-7, 3-10, 3-14, 3-18a,b, 3-22, 3-23, 7-16, 11-29

p.s. 13, 14, 15, 20D, 22, 24, 67, 67B, 268

Mitosis, meiosis, sex-linkage

p. 81-112

Problems 4-2, 4-3b-f, 4-5, 4-7, 4-12, 4-19, 4-20, 4-23, 4-26, 4-32, 4-34

p.s. 20I, 35A, 39, 40, 42A, 206, 211

Mitosis film, L on BB

Linkage and recombination

p. 123-145 (middle)

Problems 5-3, 5-5, 5-9, 5-15, 5-17, 5-20, 5-27, 10-20

p.s. 35A2, 45 to 47, 48, 50, 186, 280, 291

Bacteria, viruses

p. 540-543 (middle)

Problem 15-3

p.s. 201

Questions on p. 22 of spl.

Retrovirus life cycle, L on BB

DNA, DNA replication

p. 167-181, 184-200, 221 (Mismatch repair) + Fig. 7.13, 474 (13.3)-477

Problems 6-4, 6-7, 6-8, 6-9, 6-10, 6-14, 6-18, 6-20, 6-22, 6-24, 15-3.

Problems 5-1, 5-5 on p. 28 of spl.

p.s. 107, 108, 157, 158, 179, 251, 254

DNA replication animation, L on BB
E. coli DNA replication, L on BB
Holliday model animation, L on BB
Double-strand break recomb. model, L on BB
Telomerase animation, L on BB
Post replication mismatch repair, L on BB

Pathways, protein structure

p. 232-239
Problems 7-18, 7-24a, 7-28
p.s. 199, 266, 274, 275, 303

Gene expression

p. 228, 255-284 (top); 285 (bottom) -291
Problems 8-11a, 8-12, 8-13, 8-22, 8-23, 8-25, 8-26, 8-29, 8-30, 8-31, 8-33, 8-37
p.s. 67H, 67F, 88, 89, 141, 181, 203, 209, 224a,b,d, 232, 233, 261, 262, 293, 301a, 305, 307, 308
Transcription animation, L on BB
Protein synthesis animation, L on BB

Bacterial genetics

p. 542 (skip Genetics and Society) - 566
Problems 15-5, 15-8, 15-11, 15-15, 15-16a, 15-18, 15-19, 15-21a
p.s. 71, 148, 187, 198, 281-283, 292, 304
Conjugation animation, L on BB

Regulation in prokaryotes

p. 609-620
p. 69 of spl.
Problems 17-5, 17-6, 17-8, 17-9, 17-11, 17-13, 17-14
p.s. 77, 78, 80, 121, 180, 257, 284

Recombinant DNA and allied methods

p. 182-184, 303-335; 722 (stem cells), 724, 725
Problems 6-15a.b., 9-4, 9-5, 9-6, 9-10, 9-12, 9-14, 9-16, 9-17, 9-19, 9-24, 9-25, 9-29, 9-32, 15-7
p.s. 122, 125, 126, 164, 194, 212, 221A, 253, 276, 277, 287, 294, 300, 306
Southern blot animation, L on BB
Sanger seq. animation, L on BB
PCR Animation, L on BB
PCR Animation II, L on BB
PCR Song, L on BB
Cycle sequencing, L on BB
Stem cells, L on BB
Knock-out mouse method II, L on BB

Genomics

p. 354-370, 375-379
Problems 10-4, 10-6, 10-7, 10-9, 10-11, 10-13, 10-17, 10-18, 10-33, 10-34
p.s. 244, 246

Microarrays animation, L on BB
C'some 11 flyover, L on BB

Detection of genotypes

p. 391 (skip Tools of Genetics) - 419
Problems 11-2, 11-3, 11-4, 11-5, 11-8, 11-10, 11-12, 11-13, 11-16, 11-19,
11-20, 11-22, 11-27, 11-30
p.s. 124, 134, 218, 222, 238, 240, 243, 259, 277, 286, 288, 295, 302
RFLP animation, L on BB
DNA fingerprinting, L on BB

Regulation in eukaryotes

p. 643-669 (skip Myc-Max, p. 654)
Problems 18-6, 18-8, 18-9, 18-12, 18-15, 18-17, 18-20, 18-22, 18-25, 18-28, 18-31
p.s. 239, 255, 258
RNA interference, L on BB

Chromosomes

p. 466 (13.1)-482, 491 (skip Fast Forward) – 508
Problems 13-12, 13-16, 13-17, 13-24, 13-25, 13-27, 13-30, 14-3, 14-4, 14-6, 14-7,
14-33, 14-34a,b
p.s. 42, 296
Human Chromosome 2, L on BB

Transposable elements

p. 548, 508 (bottom) – 514
Problems 14-24, 15-26
p.s. 289
Cut and patch transposition animation, L on BB
Replicative transposition, L on BB

Cancer

p. 696-707
Problems 19-14a, 19-17, 19-21, 19-25
p.s. 244, 298, 299

N.B. Complete answers to all problems in the text can be found in the *Solutions Manual*, 3rd edition.