

SOME COMMENTS ON HUMAN HEREDITY, BIOLOGY 8 – SPRING 2009

1. This course is an introduction to genetics for students not majoring in the sciences. The prerequisite is high school biology.
2. The instructor is Eli Siegel, Dana 220A, ext. 73193, (617 627-3193), eli.siegel@tufts.edu
3. Textbook: Cummings, M.R. *Human Heredity*, 8th ed., ISBN 978-0-495-55445-5. The book is also available as an online subscription from www.coursesmart.com. Single chapters are available at \$6.49 each from: <http://www.ichapters.com/market/index.html>.
4. All students must also buy the supplement (yellow booklet) from the Biology Department. The supplement contains:
 - answers to assigned text problems
 - additional problems
 - handouts

Bring the supplement to each class.

5. Use the schedule of lectures to keep up to date with homework assignments. Homework problems are not collected, but they are similar to test problems. Answers to all assigned problems in the text are in the supplement. Make every effort to do the reading before the lecture.
6. Assignments

Readings: 3.1 indicates chapter 3, section 1 in the text. Suppl. Pg. 3 is page 3 of the yellow supplement booklet.

Assigned papers: Brody, 2005 (AP on BB) is the paper by Brody that can be found on Blackboard (BB) under the Assigned Papers (AP) button.

Problems: 2-1 is problem 1 in chapter 2 in the text. Additional problem no. 3 can be found under Additional problems in the supplement. TI no. 2 and Q2 no. 3 refer to problem 2 from Test I and problem 3 from Quiz 2 of 2008, respectively.

7. <http://blackboard.tufts.edu/>, called Blackboard, contains the website for this course. It will be used to email announcements and has links to all assigned websites.
8. Handouts are sometimes distributed in class. Arrange your notebook so that you can keep track of the handouts. Extra handouts will be placed on the bookcase in the first floor hall of Dana near the genetics bulletin board.
9. The book *Genetics Notes* is on reserve. It has clear, succinct explanations and additional problems.

10. **TEST POLICY**

- a. Tests and quizzes from 2008 are on the Biology 8 Blackboard site.
- b. There will be three quizzes and three tests with the following values:

Quiz 1	20 points
Test I	85 points
Quiz 2	25 points
Test II	100 points
Quiz 3	25 points
Test III	115 points

Test III on May6 is not a comprehensive final but will cover the last third of the course plus selected retrospective topics.

- c. If you receive extra time on tests, please have this confirmed by Ms. Sandra A. Baer. Accommodations should be scheduled at least one week in advance with the instructor.
- d. Except for verified illness or serious family emergency, all tests and quizzes must be taken on the scheduled dates.
- e. If a test or quiz is missed, a make-up must be scheduled within three days of the missed test or quiz.
- f. No calculator or other electronic device can be used during a test or quiz.
- g. Errors in marking should be brought to the instructor's attention within five days of the test's return to the class. Put no marks of any kind on a returned test; attach a note.
- h. Test answers are posted on Blackboard.

11. Grading in a previous year –

Class average = 74%

86 -	A range
72 - 86	B range
58 - 72	C range
44 - 58	D range

Lecture and Test Schedule

January	15	Cells and chromosomes	
	19	No class	
	20	Mitosis	
	21	Meiosis (Film – Mitosis), Monday schedule	
	22	Gametogenesis	
	26	Mendelian inheritance, probability	
	27	Mendelian inheritance, probability	
	29	Extensions to Mendelian inheritance	
	February	2	Pedigrees, QUIZ 1
		3	Sex linkage
5		Sex-determination, X-chromosome inactivation	
9		DNA	
10		DNA	
12		TEST I	
16		No class	
17		Chromosome structure	
19		Genes to proteins, Monday schedule	
23		Proteins to phenotypes	
24	Mutation		
26	Bacteria, bacterial genetics, QUIZ 2		
March	2	Cloning, PCR (Film-Maternal PKU)	
	3	Cloning, PCR	
	5	Biotechnology	
	9	TEST II	
	10	Biotechnology	
	12	Linkage and recombination	
	23	Human genome, genomics	
	24	Genomics	
	26	Chromosome aberrations	
	30	Chromosome aberrations	
April	31	Multifactorial traits	
	2	Multifactorial traits	
	6	Behavior	
	7	Behavior	
	9	Behavior, QUIZ 3	

13 Behavior
14 Behavior
16 Cancer (Film – Code of Life)

20 No Class
21 Cancer
23 Cancer

24 Cancer (Film – DNA fingerprinting)

May 6 **Test III, 3:30pm**

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ASSIGNMENTS

The text is *Human Heredity*, 8th ed. by Michael R. Cummings.

Suppl. = supplement (red booklet)

BB = Blackboard

AP = Assigned paper found on Blackboard

2.1 = chapter 2, section 1

2-1 = chapter 2, problem 1 at chapter end

TI = Test I, 2008 on Blackboard

Q2 = Quiz 2, 2008 on Blackboard

Linked on BB = found under External Links on the course's Blackboard site

Additional problems – found in supplement

Read the introduction to each chapter in which you have assignments.

Cells and chromosomes

2.1

2-1 to 2-4

Mitosis

2.2, 2.3

Mitosis animation (linked on BB)

Mitosis film (linked on BB)

2-6, 2-7, 2-11, 2-13, 2-18

Q1, no. 5

Meiosis, gametogenesis

2.4, 2.5

Suppl. Pg. 37, 38

Meiosis animation (linked on BB)

2-19, 2-21 to 2-24, 2-28

Additional problems 6, 7, 10, 11

Q1, nos. 2, 3, 4, 6

TI, nos. 14

Mendelian inheritance, probability

3.1 to 3.6 (skip pages 56, 57)

Suppl. Pg. 41

Mendel-from the garden to the genome (linked on BB)
3-7, 3-9, 3-13, 3-15, 3-20, 3-21, 3-24
Additional problems 1 to 3, 8, 12, 22
Q1, no. 1
TI, nos. 10, 14

Extensions to Mendelian inheritance

3.7, 4.11, 7.8
Dennis, 2004 (AP on BB)
3-30, 3-32, 3-34, 3-35
Additional problem 19
TI, nos. 5, 8, 13

Pedigrees, sex-linkage

4.1 to 4.10
Suppl. Pg. 46, 47, 48
4-10, 4-14 to 4-17, 4-20
Additional problems 13, 13A, 14 to 18, 24 to 26
TI, nos. 2, 10, 12, 15
Q2, no. 3

Sex-determination

7.4 to 7.6
7-7, 7-10, 7-11
Q2, no. 2
TII, no. 1

X-chromosome inactivation

7.7
7-16 to 7-19
Q2, no. 1
TII, no. 12

DNA, chromosomes

8.1 to 8.6
8-4, 8-5, 8-8 to 8-12, 8-19, 8-20
Additional problems 36, 37
TII, nos. 9, 14
Q2, nos. 4, 5, 6

Genes to proteins

9.1 to 9.8

Transcription animation (linked on BB)

Protein synthesis (linked on BB)

9-2, 9-4, 9-5, 9-9, 9-10, 9-15, 9-17, 9-19, 9-20, 9-24

Additional problems 28, 32, 33, 38, 39

TII, nos. 2, 3, 4, 6, 15, 17, 18, 21

Proteins to phenotypes

10.1 to 10.3

Suppl. Pg. 52-55

10-4 to 10-6

TII, nos. 8, 11, 20

Mutation

11.5, 11.6, 11.7

11-9, 11-10, 11-12, 11-15

Suppl. Pg. 72

Additional problems 29, 34

TII, nos. 13, 19

Q3, no. 7

Bacterial genetics

Suppl. Pg. 73-77

Q3, no. 9

TIII, no. 7

Cloning, PCR

13.1 to 13.6

PCR (linked on BB)

PCR Animation II (linked on BB)

PCR Song Video (linked on BB)

Southern blot (linked on BB)

13-6, 13-7, 13-9, 13-11, 13-16, 13-18, 13-20

Q3, nos. 3, 8, 10

TIII, nos. 1, 10, 11

Biotechnology

14.1 to 14.6, 16.5

Embryonic stem cells (linked on BB)

Blackett Family DNA (linked on BB; go through RFLP Analysis and Anatomy of an Autorad)

Grady, 2008 (AP on BB)

TIII, no. 1

Q3, nos. 9, 10

Linkage and recombination

15.1

Suppl. Pg. 88 to 98

Additional problems 40 to 44

TIII, nos. 3, 6

Human genome and genomics

15.2 to 15.6

Lander & Ellis, 1998 (AP on BB)

Foster et al., 1998 (AP on BB)

Suppl. Pg. 109-111

Blackett Family DNA II (linked on BB; go through What is a STR, What are the 13 CODIS loci, Methods of analysis of STRs, Genetics of STR inheritance)

Mullard, 2008 (linked on BB)

TIII, no. 8

Chromosome aberrations

6.1 to 6.8

Suppl. Pg. 121-122

Hayden, 2008 (AP on BB)

Bewley, et al., 2005 (AP on BB)

Human chromosome 2 (linked on BB)

6-4, 6-5, 6-12, 6-17, 6-19, 6-23

TIII, nos. 6, 15, 16, 17

Multifactorial traits, behavior

5.1 to 5.6

18.1 to 18.3, 18.5

Suppl. Pg. 126, 136, 137

Capron and Duyme, 1989 (AP on BB)

Stockstad, 2002 (AP on BB)

Holden, 2003 (AP on BB)

Shute, 2008 (AP on BB)

5-5, 5-7, 5-10, 5-12, 5-15, 5-16

18-5, 18-13, 18-15

TIII nos. 4, 9, 14, 16, 19

Cancer

12.1 to 12.7
12-7 to 12-9, 12-12, 12-14 to 12-16, 12-21
Brody (HPV), 2005 (AP on BB)
Dreifus, 2007 (AP on BB)
TIII, no. 21

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