

LS4 Syllabus - Fall 2007

Lectures MWF 12:00-12:50 PM LaKretz 110
 MWF 1:00-1:50 PM LaKretz 110

Instructors: Dr. Steve Jacobsen, Office LS3229, Office hours Thurs 10-12, LS3215.
Dr. Alvaro Sagasti, Office BSRB 450B. Office hours to be announced.

Course Materials. *Genetics, from Genes to Genomes*, 2nd Edition, Hartwell et. al. 2004
 Optional Study Guide/Solutions Manual with detailed problem solutions.
 Interactive Genetics, CD-ROM and workbook
 LS4 Reader, Course Reader Material, 1137 Westwood Boulevard

Administrative matters. For enrollment, illness absences or other questions that do not directly pertain to the material covered in the course contact Lily Yanez at lyanez@lifesci.ucla.edu or Mark Katayama at katayama@lifesci.ucla.edu in 2305 Life Sciences Building, 310-825-6614.

Grading. Your grade will be determined on a curve, with a maximum of 370 pts. There will be 8 quizzes (10 pts each, lowest score dropped), a Midterm (150 pts), and a Final (150 pts). Regrades will only be considered within one week after being passed back, and only for exams written in permanent ink. Calculators are OK to use on the exams, but no graphing calculators.

Discussion Sections. This is a time to go over concepts, ask questions and do problem-solving with your TA. Quizzes will be given at the end of each discussion section. You must attend the one you're enrolled in or change with permission of TA.

Assignments. For the first half of the course, problems will be from the Interactive Genetics CD-ROM/Workbook and from the back of each chapter in your text. For the second half of the course, problem sets will be handed out in class and posted on the course web site. Assigned problems will be a good indication of the types of problems that will appear on the quizzes. If you are in need of a computer, you can utilize the Life Sciences Instructional Computing Lab facility at 2127 Life Sciences Building.

Course Web Sites. Syllabus, problem assignments, practice midterms, keys, powerpoints and office hours are at <http://www.mcdb.ucla.edu/research/jacobsen/LabWebSite/jacobsenclasses.html>. Other information and the course bulletin board are at <http://www.lsic.ucla.edu/classes/fall06/>. Podcasts of the lectures are at <http://www.oid.ucla.edu/webcasts/courses>. Audio and video can be viewed on the web or downloaded and viewed on your computer, iPod or video iPod.

Bulletin board. Questions pertaining to course material and assigned problems should be posted on the course bulletin board, which will be answered by a TA each day (24 hour turn around). Week 1 and 2 = Georgeann, 3 = Jamie, 4 = Angela, 5 = Matthew, 6 and 7= Nicole, 8 =Max, 9 = Kelli, 10 = Kevin.

<u>Lecture</u>	<u>Day</u>	<u>Date</u>	<u>Topic</u>	<u>Chapt er</u>	<u>Pages</u>	<u>Quiz</u>
1	F	9/28	Introduction/Mendel	1, 2	1-12,13-37	
2	M	10/1	Probabilities, Pedigrees	2		1
3	W	10/3	Genotype/phenotype	3	43-53	
4	F	10/5	Genotype/phenotype	3	53-69	
5	M	10/8	Mitosis/Meiosis	4	77-96	2
6	W	10/10	X Chromosome Inheritance	4	98-106	
7	F	10/12	Gene linkage	5	113-120	
8	M	10/15	Gene linkage	5	121-125	3
9	W	10/17	Gene linkage	5	125-127,129-132	
10	F	10/19	Bacterial Genetics/Conjugation	14	487-501	
11	M	10/22	Bacterial Genetics/Conjugation	14	501-505	4
12	W	10/24	Bacterial Genetics/Conjugation	14	505-507	
13	F	10/26	Bacterial Genetics/Transduction	14	507-519	
14	M	10/29	Finish Bac. Gen. Review Eval			
	W	10/31	Problem solving clinics/TAs			
1	F	11/2	Complementation testing reveals that genes are distinct entities	7	206-213	
Midterm 5-6:50 PM						
Friday, November 2, 2007						
2	M	11/5	One gene makes one protein	7	213-218	5
3	W	11/7	The genetic code	8	239-247	
4	F	11/9	Hardy-Weinberg populations	20	677-682	
	M	11/12	Veterans Day Holiday			6
5	W	11/14	Evolution alters allele distributions	20	688-692	
6	F	11/16	Positional cloning in humans	11	376-378	
7	M	11/19	Molecular approaches to positional cloning	11	385-385, 387-394	
8	W	11/21	Transgenic animals	11	394-398	
	F	11/23	Thanksgiving Holiday			
9	M	11/26	Gene replacement in mice and yeast	RA, E	744-745, 858-859	7
10	W	11/28	Model organisms and mutagenesis screens		TBA	
11	F	11/30	Haploid vs diploid mutagenesis		TBA	
12	M	12/3	Hermaphrodite mutagenesis	RC	789-800, 804-805	8
13	W	12/5	Understanding cell death in worms	3, 19	56-58, 663-665	
14	F	12/7	TA Review			
Final Exam 6:30-9:30PM						
December 13, 2007						

Topic	Reading assignment	Text book Problems	CD/Workbook Problems
Mendel, Probabilities and Pedigrees.	Chapt 1, pp 1-12 Chapt 2, pp 13-37	I, II, and III, 1- 30, 32a.	Mendelian Problems 1-6. Pedigrees & Probabilities Problems 1-6.
Relationship of Genotype and Phenotype.	Chapt 3, pp 43-69	I, II, and III, 1-9, 10a-b, 11-28, 30-35.	Genotype/Phenotype Problems 1-7.
Meiosis and Mitosis X linked inheritance.	Chapt 4, pp 77-106, Dont worry about specifics of gametogenesis in humans, pp 95-98.	I, II, and III, 1-7, 8 a-g, 9-13, 17 a-c, 18-23, 25-34.	Tutorials on Mitosis and Meiosis, and Problems 1-4. X-Linked Inheritance Problems 1-5. Fly Lab Problems 1-6
Linkage and Mapping.	Chapt 5, pp 113-132, Skip page 128 interference. Skip Tetrad analysis, starting on p 132.	I, II, 2-9, 11-14, 16-17, 18a-c, 19, 21a-b, 22-23, 32a-h.	Linkage Problems 1-6
Bacterial and Phage Genetics.	Chapt 14, pp 487-519.	II and III, 1-3, 9-14, 15a, 18-19.	Bacterial Genetics tutorials. Conjugation Problems 1-5. Transduction Problems 1-4.

Quizzes

1. Concepts and terms from Lecture 1, and Chapter 2.
2. Chapter 2 problems 3,5,7,9,11,13,15,17,19,21,23,25,27,29. Chapter 3 problems 3,5,7,9,11,13,15,17,19,21,23. Mendelian Problems 1-6. Pedigrees & Probabilities Problems 1-6. Genotype/Phenotype Problems 1-7.
3. Chapter 4 problems 3,5,7,9,11,13,17a-c,19,21,23,25,27,29,31,33. Mitosis and Meiosis Problems 1-4. X-Linked Inheritance Problems 1-5. Fly Lab Problems 1-6.
4. Chapter 5 problems 3,5,7,9,11,13,17,19,21a-b,23. Linkage Problems 1-6.

Mistakes in assigned problems.

- Chapter 2, problem 23c, brief answer section in book says all others could be AA or Aa, but that's wrong because II-1, II-2, and II-3 must also be carriers.
- Chapter 2, problem 29b, brief answer section in book is wrong, solution manual correct. Answer is $[(0.9)(0.5) + (0.1)(2/3)] \times [(0.9)(0.5) + (0.1)(2/3)] \times 1/4 = 0.0667$.
- Chapter 3, problem 3, brief answer section in book is ambiguous. Answer is $c^r c^w \times c^r c^w$ gives $1/2 c^r c^w$ yellow; $1/4 c^r c^r$ red; $1/4 c^w c^w$ white.
- Chapter 3, Problem Number 8, part (a), mistake in the solutions manual. The answer states that "The only male fitting these requirements is male c whose phenotype is B,MN,Rh+". The answer should read "The only male fitting these requirements is male d, whose phenotype is B, MN, Rh+".
- Chapter 3 15b the answer in the solutions manual is wrong. It says that black is (A-B-C-), but it should be (aaB-C-).
- Chapter 4, problem 8c) Solutions manual is wrong, the answer should be 48 chromosomes x 1 chromatids each = 48 chromatids.
- Chapter 4, problem 9 c). Solutions manual and textbook says mitosis, but it could also be meiosis II.

- Chapter 4, problem 27, III-1 must be $X^{CB} X^{cb}$, since she must have inherited X^{cb} from her affected father. This is correct in Solutions Manual, but wrong in brief answer section in textbook.
- Chapter 5 number 11b. Only wrong in the answer in the back of the text, the solutions manual is correct. The Hbb^A's and S's are incorrect. They are not all A's but a mix of S's and A's.
- Chapter 5 problem 3b Solutions Manual says 9 orange: 3 black: 3 brown: 1 albino ratio. But it should be 9 brown: 3 black: 3 orange: 1 albino.

TA contact information. Office hours posted on WEB.

NAME	EMAIL	LAB
Georgeann O'Brien	gobrien@ucla.edu	Alvaro Sagasti
Jamie Marshall	jammars@gmail.com	Utpal Banerjee
Angela Jin	angelajin@gmail.com	Zuo-Feng Zhang
Matthew McBrian	mmcbrian@ucla.edu	Siavash Kurdistani
Nicole Rodriguez	nikrodriguez19@ucla.edu	Steven Dubinett
Max Greenberg	maxvcg@ucla.edu	Steve Jacobsen
Kevin Mouillesseaux	kmouille@ucla.edu	Jau-Nian Chen
Kelli Henry	<u>kfhenry@ucla.edu</u>	Robert Goldberg

LS4 Part II - Fall 2007

Instructor: Alvaro Sagasti

Office hours: Biomedical Science Research Building, room 483

The first two weeks, office hours will be on Fridays, 9-11 am: **Nov 9th, 16th**

Thereafter, office hours will be on Mondays, 9-11 am: **Nov 19th, 26th, Dec 3rd**

Problem sets: Problem sets will be handed out each Friday and posted on the course website. Extra problems from the text may be suggested.

<u>Lecture</u>	<u>Day</u>	<u>Date</u>	<u>Topic</u>	<u>Chapter</u>	<u>Pages</u>	<u>Quiz</u>
1	F	11/2	Complementation and recombination	7	206-213	
Midterm 5-6:50 PM Friday, November 2, 2007						
2	M	11/5	One gene makes one protein	7	213-218	5
3	W	11/7	The genetic code	8	239-247	
					optional: <i>Crick paper (online)*</i>	
4	F	11/9	Hardy-Weinberg populations	20	677-682	
	M	11/12	Veterans Day Holiday			
5	W	11/14	Evolution alters allele distributions	20	688-692	6
6	F	11/16	Positional cloning in humans	11	376-380	
7	M	11/19	Molecular approaches to positional cloning	11	383-394	
8	W	11/21	Transgenic animals	Ref A	744-745	
	F	11/23	Thanksgiving Holiday			
9	M	11/26	Gene replacement in mice and yeast	Ref E	851-852, 858-859	7
10	W	11/28	Model organisms and mutagenesis screens	7	220-221	
11	F	11/30	Haploid vs diploid mutagenesis	Beddington paper (online)•		
12	M	12/3	Hermaphrodite mutagenesis	optional: <i>Ref C 789-800; Haffter paper (online)•</i>		8
13	W	12/5	Understanding cell death in worms	Ref C	804-805	
14	F	12/7	TA Review			
Final Exam 6:30-9:30PM December 13, 2007						

*optional papers can be found on the course website

Quizzes for the second half of LS4

Quiz 5, November 5-9: complementation testing

Quiz 6, November 12-16: recombination mapping, biosynthetic pathways, mutations, reading frames

No discussion sections or quizzes week of November 19-23

Quiz 7, November 26-30: population genetics, positional cloning

Quiz 8, December 3-7: transgenics, knockout mice, mutagenesis screens