Bi252
Genetics and Molecular Biology

In this course we will examine the genetic and molecular mechanisms responsible for the inheritance of physical characteristics, cell division, the regulation of genes, and the development of different cell types from a common cell. We will begin with the key roles of DNA and RNA as informational molecules; we'll then explore the ways in which cells pass this information to subsequent generations, often in unique combinations. Later we will extend the discussion of proteins that was begun in Bi251, with an emphasis on proteins that regulate specific cellular characteristics, and how cells respond to changing conditions by altering their pattern of protein production. This will prepare you for Bi253, in which you will study development in complex organisms, the genetics of populations of simple and complex organisms, and how these serve as foundations of evolution.

Staff

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Format

Lectures are held 10:00-10:50 AM in 207 Chapman Hall Monday, Wednesday, and Friday. Laboratories begin during the second week of classes. **You must be registered for the lecture and a laboratory section for this course**. If you are unable to register for a laboratory section that fits your schedule, register for any section that is open and we will make accommodations for you in an appropriate section. Don't change sections through DuckWeb or the Registrar.

Exams, assignments, and grading

There will be two one-hour exams plus a comprehensive two-hour final exam. The one-hour exams will take place in the evening in 207 Chapman. They will be written as one-hour exams, but you will have two hours in which to complete the exams. Students are expected to make arrangements in their class and work schedules so that conflicts will not arise. The exams are <u>not</u> open book, but some factual information will be provided.

A problem set with answers is provided in the course packet. Working the problems will be your best form of preparation for the exams, so you are encouraged to make a sincere effort in solving them.

Your grade for the course will depend on the combination of your performance on the exams, your work in the labs, and participation in lecture (responses with i►clickers). On average, four i►clicker questions per lecture will be counted, excluding the first lecture. Approximately 120 clicker questions will be asked throughout the term, but only 100 responses will be counted toward your total course score. Scores will be determined in two ways for each student:

Method 1

	Raw points	Adjusted points	% total course points
2 1-Hour exams	(100 + 100) x 1.05 =	210	30
Final exam	200 x 1.05 =	210	30
Lecture participation	100 x 0.35 =	35	5
Lab		245	35
Total		**700**	**100**

Method 2

	Raw points	Adjusted points	% total course points
Highest 1-hour exam	100 x 1.40 =	140	20
Final exam	200 x 1.40 =	280	40
Lecture participation	100 x 0.35 =	35	5
Lab		245	35
Total		**700**	**100**

Points for lab work will be calculated as follows:

	Raw points	Adjusted points	% total course points
Quizzes	105 x 1.269 =	133	19
Prelabs + Lab reports	88 x 1.269 =	112	16
Total		**245**	**35**

Letter grades will be assigned on the basis of a student's higher score of both methods. Letter grades are determined only after the total course points have been calculated, not for individual hour exams. Since grades are not assigned strictly on the basis of statistical distribution about a numerical mean, the opportunities to earn good grades in this course are not limited, and students are not in competition with each other for those grades.

P/N option: A grade of "P" is given when the calculated grade is "C-" or better; a grade of "N" is given when the calculated grade is "D+" or lower.

Exam re-grades: If you feel that a mistake has been made in the grading of your exam, you should write a logical explanation for why your answer merits a higher score, attach it to the exam, and submit both the explanation and the exam to your lab instructor. Well thought-out arguments will be carefully considered, but other questions on the exam may be re-graded as well, and requests that we simply "look again" at an answer will not be honored. Please do not abuse this system. The deadline for submission of exams for re-grading is one week following receipt of the graded exam.

Early and make-up exams will not be administered: If you miss an exam for a valid reason (medical or family emergency), you must provide written documentation of the reason to avoid a score of 0. Your grade will then be based on the exams you have taken. A second missed exam will not be excused.

Textbook, laboratory manual, course packet and course web site

The text for this course is *Introduction to Genetic Analysis, 8th edition* by Griffiths et al. (Freeman). A required laboratory manual is available at the UO Bookstore. You must bring the manual to lab each week. A course packet containing lecture figures, problem sets, and supplemental reading is recommended, but not required. If a manual or packet is not available, request one at the Bookstore and they will have it for you within 24 hours. It is your responsibility to order these if they are sold out; we will not have copies available in class or lab. A text will be placed on 2-hour reserve in the Science Library.

The website for this course is http://www.biology.uoregon.edu/classes/bi252w10. The syllabus, lecture and lab schedules, staff information, lecture outlines, and current scores will be posted there. Instructors and teaching assistants can be reached via e-mail from the site.

Class conduct

Class starts promptly at 10:00 and ends at 10:50. Please arrive on time and do not pack up before the conclusion of the lecture. Arriving late and leaving early is disruptive to others around you and to the speaker. Do not talk during lecture in a volume audible to anyone but the intended recipient. Ringing cell phones will not be tolerated in this class. You may be asked to leave the lecture hall or lab if you are responsible for repeated disruptions. A disruption during an exam will result in a 10-point deduction.

All work submitted in this course must be your own. Instances of suspected cheating or plagiarism on exams, quizzes, and reports will be referred to the Office of Student Conduct and Community Standards for consideration of sanction. You can view the student conduct code and the procedures for pursuing charges of academic dishonesty at:
http://studentlife.uoregon.edu/StudentConductandCommunityStandards/StudentConductCode/tabid/69/Default.aspx

Bi252 Lecture Schedule
Winter 2010

Week	Date	Topic	Reading
1	Jan. 4	Chemistry of the genetic material: New uses for the kitchen blender	228-231
	Jan. 6	DNA structure: Watson, Crick, and a cast of dozens	231-236
	Jan. 8	DNA replication and the most beautiful experiment in biology	237-239
2	Jan. 11	DNA replication: Forks, enzymes, and mistakes	239-243
	Jan. 13	Mechanisms of mutation: Infidelity in the DNA	457-458; 464-466
	Jan. 15	RNA synthesis: Sending the message	256-261
3	Jan. 18	**Martin Luther King day—no class**	
	Jan. 20	RNA synthesis in prokaryotes: Finding the front and back	261-263
	Jan. 22	The genetic code: A nearly universal language	278-282
4	Jan. 25	Translation: Cracking the code	282-285
	Jan. 27	Translation: How proteins make proteins **Exam 1—7:00-9:00 pm in 207 Chapman**	285-290
	Jan. 29	Genetic analysis of metabolic pathways: When amino acids go bad	100; 187-192
5	Feb. 1	Chromosome structure and mitosis: Art and architecture	80-90; 90-93
	Feb. 3	Meiosis: Mixing it up	93-97
	Feb. 5	Inheritance of single genes: A monk in the details	28-35; 192-195
6	Feb. 8	Chromosomal basis of heredity: Sorting out genes	48-52; 75-80
	Feb. 10	The Chi-square test: How to prevent cheating with statistics	40-42
	Feb. 12	Inheritance of multiple genes: Mendel could multitask	36-39
7	Feb. 15	Genetic linkage: Wearing tight genes	116-123
	Feb. 17	Recombination and mapping: Going the genetic distance **Exam 2—7:00-9:00 pm in 207 Chapman**	124-127
	Feb. 19	Recombinant frequency and a mapping function: a limit to this madness	134-135
8	Feb. 22	Gene regulation in prokaryotes: Flipping genetic switches	302-307
	Feb. 24	The *lac* operon: A model not *lac*-ing	307-312
	Feb. 26	Positive regulation of the *lac* operon: Dueling sugars	307-312
9	Mar. 1	Catabolite repression: Why glucose is sweeter than lactose	312-315
	Mar. 3	Yeast development: The differences between boys and girls	*Lodish
	Mar. 5	Yeast development: mRNA makes the mom	*Chang
10	Mar. 8	Maternal effect genetics in development: Mother's influence	576-577
	Mar. 10	Fly development: Distinguishing the head from the butt	583-588
	Mar. 12	Fly development continued	
	Mar. 17	**Final Exam—10:15-12:15 in 207 Chapman**	

*Supplemental reading in course packet