

Biology 14L Organisms and Populations – Syllabus spring 2012

Class Meetings – Cohen Auditorium Monday 9:30-10:20am Tuesday 10:30-11:20 am Thursday 10:30-11:20am	Recitation (optional but STRONGLY RECOMMENDED) Barnum 008 Monday 4:30-5:20pm
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Course Professors

Dr. Francie Chew (course coordinator 2012)	email fchew@tufts.edu
Dr. George Ellmore	email george.ellmore@tufts.edu
Dr. Harry Bernheim	email harry.bernheim@tufts.edu

Laboratory Coordinator

Dr. David Perry	email david.perry@tufts.edu
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Textbook (author Scott Freeman): **Biological Science**. It is strongly recommended that students read the assigned material prior to coming to lecture. Read primarily for concepts and vocabulary; lectures will be the primary source of exam material. Note: The publisher (Pearson) uses different images for the textbook cover – the book you will find at the Tufts bookstore has a bird on the cover. If students buy it elsewhere, it might have a different cover image. Any 4th edition version of this textbook should contain the same scientific content and pages. A few copies of the text will be on 3-hour closed reserve at Tisch. We will not use Mastering Biology this semester; instead problem sets and timed quizzes will be available on Trunk.

2012 Lab Manual (author Colin Orians) is available at the Tufts Bookstore; one of the laboratory units requires the use of software, for which you use the code contained in your lab manual.

Course goals and objectives: Students will be examined on their knowledge and understanding of material covered in lectures and laboratory activities as well as their ability to solve problems that are relevant to the course content. Upon completing this course, you should be able to:

- ✓ Understand and explain the basic principles regarding organismal structure and function, and population processes including evolutionary changes. This background serves as a firm basis for more advanced Biology courses for which this course is a prerequisite.
- ✓ Work independently and in collaboration with others to compile, analyze, interpret, and communicate scientific data and ideas.
- ✓ Use critical thinking skills developed throughout the semester in both lecture and laboratory. In Trunk problem sets, you will have an opportunity for formative assessment to track your own learning and understanding. In summative assessments (exams, quizzes, lab reports), many of the questions require students to apply information and principles to new situations.

Laboratory sessions begin the week of January 30, 2012. If you know you will need to miss a lab (to observe a religious holiday), you **must** get permission from the Lab Coordinator [Dr. David Perry] to switch to a different lab at least one week (preferably 2 weeks) **prior** to the scheduled lab date. **To pass this course, you must pass the laboratory.** The laboratory emphasizes higher-level thinking, often requiring students to design experiments and evaluate their results. For written assignments the internet-based originality-verification system *Turn-It-In* will be required.

BIO 14 Lecture & Exam Schedule Spring 2012

Date	Day	Topic	Prof	Text Assigned*
1/19	Th	Course introduction	FC	1,4-12
1/23	M	Population growth & genetic change in populations	FC	1041-45; 414-16; 422-28
1/24	Tu	Genetic variation & its consequences	FC	428-432; 239- 251;1066-67
1/26	Th	Genetic change between generations	FC	435-443
1/30	M	Evolutionary processes	FC	443-452
1/31	Tu	Evolutionary processes, case studies	FC	1063-1064
2/2	Th	Evolutionary processes, case studies, cont'd.	FC	1067-1070
2/6	M	Speciation 1, isolation & divergence	FC	458-64, 468-70, 1046-47, 1062-63
2/7	Tu	Speciation 2: sympatric processes	FC	452-56; 464-65
2/9	Th	EXAM 1 (through 2/2) Check TRUNK for location details		
2/13	M	Speciation 3: chromosomal processes	FC	465-68;470-71
2/14	Tu	Evolutionary pathways: plant defenses as case study	FC	418-22;474-78;484-86
2/16	Th	Photosynthesis fuels food chains	GE	184-190
2/20	M	NO CLASS—PRESIDENTS' DAY		
2/21	Tu	Photosynthetic adaptation, climate change	GE	184-190
2/23	Th	MONDAY Schedule 9:30 Water movement in plants	GE	717-728
2/27	M	Drying without dying: climate change & drought	GE	717-728
2/28	Tu	Sucrose is king: phloem as <i>el camino real</i>	GE	728-734
3/1	Th	EXAM 2 (2/6-2/23) Check TRUNK for location details		
3/5	M	Sucrose economy: sources and sinks	GE	728-734
3/6	Tu	Response to env't: auxin as chemical signal	GE	755-762
3/8	Th	Flowering: evidence for signal transduction	GE	759-762
3/12	M	Fruit growth & ripening: sugarspots in fields of gold	GE	773-774
3/13	Tu	Ethylene, the gaseous hormone	GE	773-774
3/15	Th	EXAM 3 (2/27-3/13) Check TRUNK for location details		
3/26	M	Homeostasis/Introduction to respiration	HB	814-16; 861-65
3/27	Tu	Respiration—Mechanics 1	HB	867-70
3/29	Th	Respiration—Mechanics 2	HB	867-70
4/2	M	Respiration—carrying of O ₂ and CO ₂	HB	870-74
4/3	Tu	Respiratory control/Intro to circulatory system	HB	874-77
4/5	Th	Electrical excitation of hear/heart cycle	HB	877-81
4/9	M	Vasculature	HB	875-77
4/10	Tu	Blood pressure control	HB	882-83
4/12	Th	Exercise part 1	HB	Lecture only
4/16	M	NO CLASS—PATRIOT'S DAY		
4/17	Tu	Exercise part 2	HB	Lecture only
4/19	Th	EXAM 4 (3/26-4/9) Check TRUNK for location details		
4/23	M	Renal physiology—introduction	HB	90-91;832
4/24	Tu	Renal physiology—filtration	HB	832-34
4/26	Th	Renal physiology—reabsorption, dilute urine	HB	834-38
4/30	M	Renal physiology—concentrated urine; course evaluation	HB	834-838
5/10	Th	FINAL EXAM 12noon-2pm PLACE TBA—check TRUNK		

EXAM material is drawn primarily from lectures, supplemented by text, occasionally from lab.

2/2 LAST day to add or P/F; 2/23 LAST day— srs, jrs, sophs to drop without W; 4/5 LAST day—freshman to drop without W

We will do our best to follow this syllabus but reserve the right to make changes if needed.

BIO 14 LAB SCHEDULE SPRING 2012

LAB	WEEK	TOPIC	ASSIGNMENT DUE
1	Jan 30	Mutation and Trait Evolution I & Descriptive Stats / Data Presentation	--
2	Feb 6	Mutation and Trait Evolution II & How to write 1 st lab report	Descriptive stats worksheet
3	Feb 13	Solanaceae Phylogeny	Flowers and Trees worksheet
NO LAB THIS WEEK (PRESIDENTS' DAY)			Mutation Lab Report Due Thursday 2/23 at noon
4	Feb 27	Plant Hormones, Scientific Paper Dissection & Library Resources	Phylogeny worksheet
5	Mar 5	Digestive Physiology I & Statistical Analyses	Plant hormone and library worksheets
6	Mar 12	Digestive Physiology II & How to write 2 nd lab report	Group data (due at end of lab)
NO LAB THIS WEEK (SPRING BREAK)			
7	Mar 26	Rashi Simulating Diagnosis	Digestive physiology lab report
8	Apr 2	Respiration	Respiration worksheet
9	Apr 9	Comparative Anatomy	
10	Apr 17-23	LAB PRACTICAL EXAM	Rashi case report

Afternoon labs 1:20-4:20 pm (1:30-4:30 T)

Evening labs 6:00-9:00 pm

Lab sections A,C,E,H,I,K meet in Barnum 200

Lab sections B,D,F,G,J,L meet in Barnum 216

GRADING

- Your lab grade will account for ~24% of your overall course grade (see p. 4)
- All written assignments are due at the beginning of lab on the day of your lab section.
- Lab policies are described in the following pages of your lab manual.

Your lab grade will be based on:

Mutation Lab Report	15%
Digestive Physiology Lab Report	20%
Rashi Case Report	20%
Lab Practical	25%
Quizzes	10%
In-Lab Assignments/Worksheets	5%
Participation and Attendance	5%

COURSE GRADING

In-class EXAM 1 (Th Feb 9, 10:30am)	80 pts
In-class EXAM 2 (Th Mar 1, 10:30am)	80 pts
In-class EXAM 3 (Th Mar 15, 10:30am)	80 pts
In-class EXAM 4 (Th Apr 19, 10:30am)	80 pts
TRUNK—problem sets/quizzes (online) highest eleven scores	55 pts
Final exam (Th May 10, 12noon-2pm) Do NOT schedule travel plans that will conflict with this exam	100 pts
LABORATORY Note: You MUST pass the lab component in order to pass BIO 14L	150 pts
TOTAL POINTS (to be fair to all students, no extra credit assignments are allowed for this course). There are no make-up exams. If you are too ill to take an exam or cannot take an exam at its scheduled time, contact Dr. Chew as soon as possible.	625 pts

- ✓ **All students at Tufts University are expected to live up to the highest standards of academic honesty.**
- ✓ **Due to the size of the class, not everyone will take their in-class exams in Cohen. Exam locations will be posted on the Trunk course site prior to each exam.**

NEED ASSISTANCE?

General questions about BIO 14?

Dr. Francie Chew (course coordinator), email: fchew@tufts.edu

Office: Barnum 107, spring 2012 office hours: M 2:30-4, Tu 1:00-3:00, W 1:30-3:30, Th 1-2 and by appointment.

General questions about BIO 14 laboratory?

Dr. David Perry, (laboratory coordinator), email: david.perry@tufts.edu

Office: Dana 220A, spring 2012 office hours: Thursday, 3:00-5:00pm & by appointment

Specific questions about the course material?

Please bring questions to the Monday Recitation 4:30-5:20pm, Barnum 08 or contact the lecturer who taught the material.

Professor/Unit taught	Office	Email address	Office Hours S'12
Dr. Francie Chew (unit 1)	Barnum 107	fchew@tufts.edu	M 2:30-4, Tu 1-3, W 1:30-3:30, Th 1-2 and by app't.
Dr. George Ellmore (unit 2)	Barnum 205	george.ellmore@tufts.edu	Tu 2-4 and by appointment
Dr. Harry Bernheim (unit 3)	Barnum 105	harry.bernheim@tufts.edu	Tu 1-2pm and Th 4:30-5:30 pm and by appointment
Dr. David Perry (laboratory coordinator)	Dana 220A	david.perry@tufts.edu	Th 3-5 and by appointment

ADDITIONAL IMPORTANT RESOURCES FOR BIO 14 STUDENTS

1. **TRUNK website:** Announcements are posted at this site and pdf's for lecture slides are available the evening before the lecture. To gain access to this site you must be enrolled in this course BIO 14L (Spring 2012) Organisms & Populations. The site will be shown under "My Sites" when you login at <https://trunk.tufts.edu/library/skin/trunkskin/search.html>

2. TRUNK Problem sets and timed quizzes

Problem sets and timed quizzes are designed to enable students to assess how well they understand the lecture material taught each week, and to practice answering exam questions. Eight problem sets will generally be open on Mondays at 11:00am, are multiple access until Sunday at 11:00pm when the highest score will be recorded. Students may get differing material on each access. Four quizzes are single, timed access, usually 2-3 days before an exam. There are 12 assignments, your course score is the highest 11 scores.

3. **Podcast enhanced lecture files:** <http://podcasts.uit.tufts.edu/rss/590/590.rss> to subscribe. Additions to **2012 Bio14 Podcasts** will usually be posted within a few hours after lecture, and will contain an integrated audio and slide file. This technology is not guaranteed. It is strongly recommended that students attend class and use the podcasts as an aid to study. Use the username and password you use for Tisch library resources when you are not at a Tufts computer.

4. **Weekly faculty-led review/recitation session:** starting January 30 and ending April 30, on Mondays 4:30-5:20, Barnum 08, faculty will hold a question-answer session in Barnum 08. (There will be one final review, TBA) These sessions are driven by student questions, so bring yours.

5. **Weekly office hours:** Both faculty and graduate laboratory instructors hold office hours (see p. 4 of this syllabus for faculty office hours). If you have questions, meeting with faculty (lecture) and your lab instructor (lab) can often help clarify things.

6. **ARC Peer Tutors:** (Academic Resource Center, Dowling Hall, Subject.Tutoring@tufts.edu). If you seek a tutor or are more comfortable working with other students, the ARC Peer Tutors are an excellent option. They cannot help you with problem sets but will assist you to understand concepts and problem solving in Bio 14. One-on-one tutoring appointments are available through the TutorFinder on WebCenter (<https://webcenter.studentservices.tufts.edu/login.aspx>). Additionally, Resident/Head Tutors will hold drop-in hours on campus throughout the week. The ARC also holds tutor-led review sessions before exams, times and locations to be posted on the BIO 14 Trunk site.

7. BIO 14 Study Groups:

You are encouraged to form a peer study group that meets each week for 1 to 1.5 hours to review, discuss, and apply material to studying for exams. A limited number of students will be able to enroll in small-group sessions run by ARC Peer Tutors on a first-come, first-serve basis. An online application link will be emailed to all students registered in Bio 14 during the first full week of classes. These sessions will meet weekly for 1.5 hours.

TRUNK Problem Sets and Timed Quizzes

To access TRUNK Problem Sets and Timed Quizzes, a student must be registered in this course. The BIO 14 Website will automatically show up in your TRUNK account under “My Sites” when you are registered.

Problem Sets are designed to be formative assessments—that is, they enable you to track yourself and see how you are doing. Because the problem sets allow multiple access, and each access will give you a somewhat different array of specific questions, you can “practice” many different questions of a similar type by multiple access to a particular problem set in a given week. Each time you access a problem set, you will get a score, but the answers will not be released until the next Monday, when you will then be able to get back into your problem sets and access answers for all the questions you attempted. The highest score you get by the end of the week is what will be recorded. For this reason, it makes most sense to work in your study group to understand concepts, and then work the problem set *on your own*, so you will be assured that any score is indeed the product of your personal understanding.

Timed Quizzes are designed to give you a sense of your ability under exam-like conditions, single access, timed, with the cumulative score recorded at the end of the time period. The timed quizzes will usually be “open” only for a 48-hour period, often running concurrently with Problem Sets, so you will be able to go back to problem types that you need to review.

There are 8 Problem Sets and 4 Timed Quizzes. They are each worth the same number of points; your highest 11 scores will contribute to your grade in the course. While point-wise these assignments are not worth very much (about 9% of your grade), they are important because effort matters—your persistence with these problem sets will expose you to a wider array of potential exam questions. Many of the questions are taken from recent exams, so we do not publish past exams; if you want those questions, use multiple access of the problem sets.

List of Problem Set and Timed Quiz Assignment-Due dates and times. Note that the Problem Set or Quiz *closes* at the exact time given, so the assignment is due *before* the time. We will do our best to follow this schedule but reserve the right to modify and announce changes if needed.

Assignment	Assigned	Due before	Answers released
Problem Set 1 (FC)	M 1/23, 11am	Sun 1/29 <i>before 11:00pm</i>	M 1/30, 11am
Problem Set 2 (FC)	M 1/30, 11am	Sun 2/5 <i>before 11:00pm</i>	M 2/6, 11am
3—Timed Quiz (FC)	M 2/6, 11am	Wed 2/8 <i>before 11:00pm</i>	right after quiz closes
[Exam 1 material 1/19-2/2, Th 2/9]			
Problem Set 4 (FC/GE)	M 2/13, 11am	Sun 2/19 <i>before 11:00pm</i>	M 2/20, 11am
Problem Set 5 (GE)	M 2/20, 11am	Sun 2/26 <i>before 11:00pm</i>	M 2/27, 11am
[Exam 2, material 2/6-2/27, Th 3/1]			
Problem Set 6 (GE)	M 2/27, 11am	Sun 3/4 <i>before 11:00pm</i>	M 3/5, 11am
7—Timed Quiz (GE)	M 3/12, 11am	Wed 3/14 <i>before 11:00pm</i>	right after quiz closes
[Exam 3, material 2/28-3/13, Th 3/15]			
Problem Set 8 (HB)	M 3/26, 11am	Sun 4/1 <i>before 11:00pm</i>	M 4/2, 11am
Problem Set 9 (HB)	M 4/2, 11am	Sun 4/8 <i>before 11:00pm</i>	M 4/9, 11am
10—Timed Quiz (HB)	Tu 4/10, 11:30am	Th 4/12 <i>before 11:00pm</i>	right after quiz closes
[Exam 4, material 3/26-4/9, Th 4/19]			
Problem Set 11 (HB)	M 4/23, 11am	Sun 4/29 <i>before 11:00pm</i>	M 4/30, 11am
12—Timed Quiz (FC/GE/HB)	Th 5/3, 11am	Sun 5/6 <i>before 11:00pm</i>	right after quiz closes

[FINAL EXAM (material cumulative with emphasis on 4/10-4/30) Th May, 12-2 pm, place to be arranged]