

Biology 141
Introductory Biology I with Laboratory
Fall Semester 2000

Professor: Bruce Ostrow, Ph.D.

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Office Hours: Tuesdays 9-12, Wednesdays 2-5, Fridays 1-4, *and* by appointment

Office: Pierce 104

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Lecture Hours: Monday, Wednesday, Friday 9:05 - 9:55 a.m.

Room: Pierce 102

Lab Hours: Tuesday 2:00 - 5:00 p.m.

Room: Pierce 125

Required Text: (available at bookstore)

Biology, 5th ed. Campbell, Reece, and Mitchell. Benjamin/Cummings Publishing Company, Inc. 1999.

Required Lab text (available at bookstore)

Investigating Biology, 3rd ed. Morgan, Judith Giles and M. Eloise Brown Carter. Benjamin/Cummings Publishing Company, Inc. 1999. *Used lab manuals are not acceptable in this course.*

Course Plan:

1. The objective of this class is to learn the core concepts of several fields of Biology and to discuss issues relevant to these fields including social and environmental issues. There is no prerequisite for this course.
2. Attendance at all lectures and labs is required. The Biology Department Absence Policy is detailed at the end of the syllabus.
3. Your success in learning the material is dependent on attending class, taking good notes, and participating in discussion. You must work to understand the ideas, not just memorize the material. Open discussions that are informative and thought provoking will happen only if you come to class prepared. All lectures are structured to allow time for questions and discussion. You are encouraged to come to my office hours for additional discussion.
4. Supplemental Instruction is provided for this course. The S.I. leader will hold regular meetings to review course material. Also you are encouraged to form study groups and to work with your peers. However all work turned in is expected to be of your own thoughts and construction.
5. Included in your textbook is a CD-ROM, the Interactive Study Partner, and a one-year subscription to *The Biology Place* web site. These study aids contain practice quizzes, a glossary, exercises, animations, and lab simulations. Use them, along with the Student Study Guide, to supplement your studying.

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6. A LearnLink Conference has been set up for this class. You can access it by going to the following folders: Public Conferences/ Oxford College/Class Conferences/ Oxford: Biology/ 141 Ostrow. Put the conference on your LearnLink desktop. Check the conference daily for announcements and feel free to post class-related notices/questions to it!
7. In the lab, we will be working with potentially infectious microbes and dangerous materials. **Food and drinks are absolutely prohibited!** It is imperative that you read the lab before attempting the experiment.
8. Cheating is not acceptable. You must abide by the Honor Code. Your signature on items turned in for credit (examinations, homework, lab work) attests to your upholding the Honor Code.
9. Beepers and cell phones are not allowed. Laptop computers are allowed if they are quiet.
10. I do not provide back-tests for this class. If you know of any back-tests for this class, please let me know and then I will make them available for the whole class.

11. Grading	3 lecture exams	43%	300 points
	3 lab exams	21%	150 points
	1 final exam	25%	165 points
	6 writing assignments	5%	35 points
	<u>1 lab project</u>	<u>7%</u>	<u>50 points</u>
	Total	100%	700 points

Tests

There will be three lecture exams, three lab exams and a Final. Lecture exams will include multiple choice questions, questions requiring short answers, and longer essay questions. Lab exams have both a written part and a practical component. The Final exam will be comprehensive. Exams are held on Tuesday and Thursday mornings at 8am in P102. Tests will be taken at the scheduled time. **There will be absolutely no makeup tests!** If you are too sick to take a test **you must let me know prior to the test**; otherwise you will receive a 0 for that test!

Writing assignments

Library Exercise (5 points)

The objective of this exercise is to acquaint you with the Oxford College Library scientific literature holdings and how to conduct a scientific literature search. On Tuesday September 12, we will meet in the Humanities Multimedia Center at which time you will get a worksheet that is due in class on Monday Sept. 18.

Lab writing assignments (20 points)

There is a writing assignment associated with four of the lab exercises. Each of those weeks, you will write one or two sections of a scientific paper. Writing assignments are due the beginning of the next lab period after the exercise is completed.

Interview with the Biologist (10 points)

The objective of this exercise is to acquaint you with what it means to be a biologist and what it takes to be a biologist. You will find someone employed in a field of Biology and after approval by the professor, conduct an interview with that person. You will write a report stating a) why you chose to interview that person, b) what you found and c) how the interview affected your thinking. This typed, double-spaced report (average length = 1½ pages) is due on October 23 but can be turned in anytime before that.

Lab Project

Starting in week 8 you will conduct a self-directed laboratory research project. Using the skills learned from the writing assignments, you will write a complete scientific paper presenting the results obtained in your experiment. You will present your project to your classmates in lab on November 7th. The complete paper will be due November 17th.

Class Participation

The final grade you receive can be influenced by your attendance and class participation.

Your grade in the course will be based on a point system with an approximate total of 700 points. The scale is:

90-100% = A
80-89% = B
70-79% = C
60-69% = D
<60% = F

Plus and minus grades are given.

Little flower – but if I could understand
What you are, root and all, and all in all
I should know what God and man is

– Lord Tennyson

STUDENT'S GUIDE TO BIOLOGY 141

Welcome to Biology 141! The information in this handout and accompanying materials must be read and followed by all students in Introductory Biology. If you do not understand everything in this handout, you should ask for clarification.

Introductory Biology (141) is designed for students who **plan to major in biology**, attend **professional school in a health related field**, or **have a strong background in biology** and have chosen biology to fulfill their distribution requirements (or just for the joy of it). This may be one of the more difficult courses you will take, demanding that you not only learn detailed and complicated information, but that you also organize this information within the major concepts of biology. This information will be essential to your success in other biology courses, where your competence in basic biology will be assumed. In addition many of you will be taking examinations to enter graduate or professional schools, and the knowledge you gain here will be required later.

Studying. If you are an average reader, you should spend about **8 hours a week** outside class working in BIO 141. If you are a slow reader, you will have to spend more time. Whatever you do, do not allow yourself to fall behind during the first couple of weeks, as it will be extremely difficult to catch up. Similarly, cramming, or pulling an all-nighter, does little good before an exam in this course, because you must be mentally alert during the test.

The best overall study **approach is to read assignments over quickly at first, like a novel, for an overview. Then read more carefully, jotting down questions or areas of confusion for later checking and review.** After you are reasonably confident of your knowledge, **arrange to have a study buddy ask you questions.** Answer the questions in the book and study guide. Be sure you understand **terminology**, and that you have carefully reviewed and understand **diagrams** in your text and class handouts. It is helpful to **prepare your own tables and diagrams** as a study aid and review for much of the material in BIO 141.

College courses generally require you to know much more material, and the material is presented at a much **faster** pace than in high school. This means it is more difficult to catch up if you fall behind. In BIO 141 it is also necessary to demonstrate thinking, as well as memorization. **Memorization** may be a skill that your mastered in high school and it is still very important, but it is **not sufficient** in college. You must be able to demonstrate that you understand concepts and that you can apply them, as well as simply stating them. You will gain experience with this in the classroom, laboratory and on examinations.

One of the most common problems for good students in introductory biology is their **familiarity** with the subject. They are confident that they understand the material and are prepared for a test, because they recognize all the terms, and the concepts make sense. **Don't be lulled into thinking that familiarity is the same as knowledge.** You will be asked to differentiate between very similar answers, to provide complete, thorough and precise answers. Don't be caught wishing you had really studied!

Course Schedule
 Biology 141 General Biology I
 Fall Semester 2000
 Bruce Ostrow, Ph.D.

<u>Week</u>	<u>Day</u>	<u>Date</u>	<u>Topic</u>	<u>Book Pages</u>
1	Wed.	Aug. 30	Introductions; Themes in Biology	Chap. 1
	Fri.	Sept. 1	The Scientific Method/ Survey	13-18
2	Mon.	Sept. 4	No Class (Labor Day Holiday)	
	Wed.	Sept. 6	The Chemistry of Life: inorganics	28-34; 37-8; 43-5
	Fri.	Sept. 8	The Chemistry of Life: carbohydrates and lipids	58-68
3	Mon.	Sept. 11	The Chemistry of Life: proteins and nucleic acids	68-79
	Tues.	Sept. 12	Scientific Literature and Research (Handout) (Meet in the Humanities Multimedia Center, 8:30- 9:30 a.m.)	
	Wed.	Sept. 13	The Cell: The Unit of Life	Chap. 7
	Fri.	Sept. 15	Membrane structure	130-135
4	Mon.	Sept. 18	Membrane transport	136-144; *
	Wed.	Sept. 20	ATP, enzymes, and electron carriers	88-97; 147-52
	Thurs.	Sept. 21	EXAM I 8:00 - 9:30 a.m. (through membrane transport)	
	Fri.	Sept. 22	Cellular respiration I – Glycolysis	152-6
5	Mon.	Sept. 25	Respiration II - Transition and the TCA Cycle	156-8
	Wed.	Sept. 27	Respiration III - Electron Transport Chain	156-61
	Thurs.	Sept. 28	Scientific Data Presentation Workshop (Handout) (Meet in the Humanities Multimedia Center, 8:15- 9:30 a.m.)	
	Fri.	Sept. 29	Review of Respiration	161-6
6	Mon.	Oct. 2	Energy for Life: Photosynthesis	168-175
	Wed.	Oct. 4	Photosynthesis I: light dependent reactions	176-9
	Fri.	Oct. 6	Photosynthesis II: light independent reactions	180-185
7	Mon.	Oct. 9	Review of Respiration and Photosynthesis	Chaps. 9, 10
	Wed.	Oct. 11	Continuity of Life: Mitosis and Cell division	Chap. 12
	Thurs.	Oct. 12	EXAM II 8:00 - 9:30 a.m. (through photosynthesis)	
	Fri.	Oct. 13	Continuity of Life: Meiosis and Life Cycles	Chap. 13
8	Mon.	Oct. 16	No Class (Midsemester Break)	
	Wed.	Oct. 18	Mendelian Genetics I	239-44
	Thurs.	Oct. 19	Introduction to lab genetics project (Handout) (sign up for 8:15-9:30am or 9:30-10:45am)	
	Fri.	Oct. 20	Mendelian Genetics II	244-7

9	Mon.	Oct. 23	Non-Mendelian Genetics	247-51; 261-3; 268-71; **
	Wed.	Oct. 25	DNA and chromosomes	278-283; 344-6
	Fri.	Oct. 27	Replication	284-291
10	Mon.	Oct. 30	The Central Dogma: Transcription	296-302
	Wed.	Nov. 1	The Central Dogma II: Translation	304-11
	Fri.	Nov. 3	The genetic code and mutations	298-9; 271-74, 312-6
11	Mon.	Nov. 6	Control of gene expression	337-341; 352-7
	Wed.	Nov. 8	Review of genetics	
	Thurs.	Nov. 9	EXAM III 8:00 a.m. - 9:30 a.m. (through genetics)	
	Fri.	Nov. 10	History of Evolutionary Thought	414-21
12	Mon.	Nov. 13	Evidence for evolution	422-6; 457; 464-6; 476-80
	Wed.	Nov. 15	Colonization of Land	536-43; 546-51
	Fri.	Nov. 17	Bryophytes and seedless vascular plants	552-9
13	Mon.	Nov. 20	Seed plants	Chap. 30
	Wed.	Nov. 22	No Class (Thanksgiving Holiday)	
	Fri.	Nov. 24	No Class (Thanksgiving Holiday)	
14	Mon.	Nov. 27	Plant structure	670-88
	Wed.	Nov. 29	Transport/ nutrition in plants	700-11, 714-17, 720-26
	Fri.	Dec. 1	Plant Growth and Development	736-48; 762
15	Mon.	Dec. 4	Habitats	1026-30; 1034-47
	Wed.	Dec. 6	Ecosystems	Chap. 54
	Fri.	Dec. 8	Ecology: dynamics	1043; 1048-50; 1086-92; 1097; 1122-24
16	Mon.	Dec. 11	Review for Final	
	Wed.	Dec. 13	No Class (Reading Day)	
Finals	Tues.	Dec. 19	FINAL EXAM 2:00 – 5:00pm (comprehensive)	

* Library Exercise Due

** Interview with the Biologist Due

**BIOLOGY 141
LABORATORY SCHEDULE
FALL 2000**

<u>Date</u>	<u>Lab Topic (Lab #)</u>	<u>Writing Assignment</u>
Sept. 5,7*	Scientific Investigation (1)	Materials and Methods
11,12	Microscopes and Cells (3)	
18,19	Diffusion and Osmosis (4)	Introduction; References Cited
25,26	Enzymes (2)	Results
Oct. 2,3	Respiration and Fermentation (5)	Discussion
Oct. 5 (Thurs.)	LAB EXAM 1,2,3,4, (8:15-9:30am or 9:30-10:45am)	
9,10	Photosynthesis (6)	Figure
16,17	No Lab (Midsemester Break)	
Oct. 19 (Thurs.)	Introduction to Genetics project (Handout) (sign up for 8:15-9:30am or 9:30-10:45am)	
23,24	Mitosis and Meiosis (7)	Review Table
30,31	Genetics Workshop (Powerpoint demonstration, 2-3pm)	
Nov. 2 (Thurs.)	LAB EXAM (5,6,7) (8:15-9:30 am or 9:30-10:45 am)	
Nov. 6,7	Genetics Symposium	Scientific Paper (due 11/17)
13,14	Plant Diversity I: Bryophytes and Seedless Vascular Plants (15)	
20,21	No Lab (Thanksgiving Break)	
27,28	Plant Diversity II: Seed Plants (16)	
Dec. 4,5	Plant Anatomy (19)	
Dec. 12 (Tues.)	LAB EXAM (15, 16, 19) (8:15 a.m. - 9:30 a.m. or 9:30 a.m. - 10:45 a.m.)	

ABSENCE POLICY - Biology Department

All students are expected to attend all lecture and laboratory sessions. However, emergencies may arise which will necessitate absences from class. Students are allowed 4 cuts in lecture and NO CUTS in lab. Students may only miss lab without penalty in cases of illness, family emergency or a school sponsored event which is cleared with the professor in advance. Students are responsible for all material which is covered in laboratory and lecture. When possible, students will be allowed to "make-up" laboratory material missed due to an excused absence, however, because of the nature of laboratory material, actual "make-up of missed activities is usually impossible.

PENALTIES

Students who exceed the 4 cut limit in lecture for whatever reasons or have an unacceptable absence from laboratory will have their FINAL grade reduced 5 points per absence. Students who miss 2 labs without acceptable reasons will fail the course (see below).

LECTURE ABSENCES:

THERE ARE NO EXCUSED ABSENCES FOR LECTURE. Each student may be absent four times without penalty. These four cuts may be used for any reason: illness, studying, travel, family emergency, etc. However, ANY additional cuts will result in grade reduction. USE YOUR CUTS JUDICIOUSLY, e.g. for sick leave only.

ACCEPTABLE LABORATORY ABSENCES

Although no discretionary absences, i.e. "cuts", are allowed regarding laboratory, on rare occasions, illness, family emergencies, or certain school sponsored events may make it necessary for a student to miss a laboratory session. The instructor MUST be notified prior to the day of the absence in all but the most extreme emergencies.

In all cases, the final decision regarding whether or not an absence is acceptable will be made by the instructor.

AN UNACCEPTABLE ABSENCE FROM LABORATORY RESULTS IN A FIVE POINT REDUCTION IN THE FINAL GRADE. TWO UNACCEPTABLE LABORATORY ABSENCES RESULT IN FAILURE OF THE COURSE.

MISSED TESTS

Ordinarily, tests cannot be made up, however, this is up to the instructor. If a student misses a test, and the absence is acceptable the missed test will not count either for or against the student. If the absence is not excused the grade will be a zero. Students are cautioned that any excuse for missing an exam will come under severe scrutiny by the instructor. THE INSTRUCTOR MUST BE NOTIFIED PRIOR TO THE TIME OF THE EXAM, AND THE INSTRUCTOR MAKES THE FINAL DECISION REGARDING WHETHER OR NOT AN ABSENCE IS ACCEPTABLE.

Laboratory tests which are missed for a reason that is excused MUST be made up. The instructor must be notified prior to the time of the test.

RELIGIOUS HOLIDAYS:

Students must notify the instructor one week in advance if they intend to be absent for a religious holiday.

TARDINESS

Being late to class is rude and distracting. Continued tardiness by any student will result in the assignment of absences and ultimately a reduction in the student's grade. Three tardies equal an absence. The tardy student is responsible for notifying the instructor that she/he entered the classroom late and, therefore, was not absent. The instructor reserves the option of excluding a person from further classroom or laboratory participation if the student is continuously tardy.

Falsification of information regarding absences from class or laboratory will be considered as a breach of academic integrity.