

Biology 141 General Biology I

Syllabus

Fall Semester 2003

Professor: Dr. M. Eloise Brown Carter

Office: Pierce Hall #105

Phone: (770)784-8343

Lecture Hours: Monday, Wednesday, Friday 11:45 a.m. – 12:35 p.m.

Room: Pierce 102

Lab Hours: Tuesday 2:30 – 5:30 p.m.

Room: Pierce 125

Office Hours: Tuesday - 1:00 to 2:00 p.m. and Wednesday - 12:45 to 1:30 p.m. Students are encouraged to see Dr. Carter during class to make appointments for other times.

Required Text: *Biology*, N.A. Campbell, 2002, 6th edition, Benjamin/Cummings Publishing Co., Inc. Study Guide is available for sale in the bookstore and is on reserve in the library.

Required Lab Text: *Investigating Biology*, 4th ed. Morgan, Judith Giles and M. Eloise Brown Carter. Benjamin/Cummings Publishing Company, Inc. 2002. *Used lab manuals may not be used.* **Optional Lab Supplement:** Rust, T.G., A Guide to Biology Lab, Southwest Educational Ent.

Date	Topic	Readings

Aug. 27	Science as a Way of Knowing	1
29	Major themes in Biology	1
Sept. 1	LABOR DAY	
3	Hierarchies: beginning with biological chemistry and water	2,3
5	Building biological macromolecules: carbohydrates and lipids	4,5
8	Proteins and nucleic acids	4,5
10	Structure and function revealed in cells	7
11 th	8:15 - 9:30 am Scientific Literature and Research Meet in Pierce 206	Handout
12	Membrane structure; cell transport	8

	15	Transport problems	8
	17	Fundamentals of energy transformations: enzymes, ATP and electron carriers	6
	18 th (Thur)	EXAM I 8:00 - 9:30 a.m. (through membrane transport)	
	19	Cellular respiration I – Glycolysis	9
	22	Cellular respiration II - Transition and Krebs Cycle	9
	24	Cellular respiration III - Chemiosmosis and the Electron Transport System	9
	25 th	8:15 - 9:30 a.m. <i>Scientific Data Presentation</i> <i>Meet in Pierce 206</i>	
	26	Review and recapitulation: Accounting Day	
	29	Homage to photosynthesis	10
Oct.	1	Photosynthesis I: the light dependent reactions	10
	3	Photosynthesis II: the light independent reactions and variations (C4 and CAM)	10
	6	Review and recapitulation: Problems	
	8	Cell reproduction: cell cycle, mitosis	12
	10	Sexual reproduction: meiosis	13
	13	***FALL BREAK***	
	15	Chromosomal mutations and gametogenesis	13, 14
	16(Thurs.)	EXAM II 8:00 - 9:30 a.m. (through photosynthesis)	
	17	Mendelian inheritance, a new vocabulary and paradigm	14
	20	Understanding the basis of inheritance	14,15
	22	A buffet of genetic phenomena	14,15
	24	DNA structure and replication	16
	27	Gene to Protein I: transcription and the genetic code	17
	29	Gene to Protein II: translation and genetic mutations	17
	31	Control of gene expression	19, pp. 362-365; 367-368
Nov.	3	Review and recapitulation: Genetics	
	5	Charles Darwin and the changing paradigm	22
	7	Evidence for evolution	22,25, pp. 484-494

10	The power of molecular evolution	25, pp. 497-499
11th (Thur)	EXAM III 8:00 – 9:30 am (through genetics)	
12	Bryophytes and seedless vascular plants	29
14	Sexual reproduction in seed plants	30,38, pp. 783-788 789-793
17	Review of plant evolution	
19	Plant structure and function	35, pp. 720-738
21	Transport in plants	36, pp. 752-764
24	Ecology Case Study I: population and community dynamics	52, 53, pp. 1156-1171
26-28	***THANKSGIVING BREAK***	
Dec. 1	Ecology Case Study II	53, 1174-1184, 1186- 1191
3	Ecology III: Ecological concepts; carbon cycle	54
5	Ecology IV: review & recapitulation	
8	The Big Themes Revisited	

***** FINAL EXAMINATION *** Wednesday, December 17, 2003, 2-5pm**

BIOLOGY 141 - LABORATORY SCHEDULE
Fall 2003
Dr. Eloise Carter and Dr. Nitya Jacob

<u>Date</u>	<u>Lab Topic (#)</u>	<u>Writing Assignment</u>
Sept. 2, 3*	Scientific Investigation (1)	Introduction; References
9, 10	Microscopes & Cells (3)	Review table, Library reserve +
16, 17	Diffusion & Osmosis (4)	Title page; Discussion
23, 24	Enzymes (2)	Materials and Methods
30 (Tues.)	LAB EXAM – 1, 2, 3, 4 (8:15 – 9:30 a.m.; 9:30 – 10:45 a.m.)	
30, Oct. 1	Photosynthesis (6)	Results, Figure and Table
Oct. 7, 8	Aquatic Ecology	Handouts
13,14	**FALL BREAK**	No Lab
21,22	Mitosis and Meiosis (7) Introduction to Research	Comparison Table Proposals, List of Materials due in lab today
28, 29	Research Project Cellular Respiration (5)	
28 (Tue.)	LAB EXAM (6, 7, Aquatic Ecology)(8:15 – 9:30 a.m.; 9:30 – 10:45 a.m.)	
Nov. 4,5	Research Symposium	Scientific Presentation
11,12	Plant Diversity I: Bryophytes and Seedless Vascular Plants (15)	Outline+
18,19	Plant Diversity II: Seed Plants (16)	Outline+ Papers due in Lab!
25,26	***THANKSGIVING BREAK***	
Dec. 2,3	Plant Anatomy (19)	Review Table+
9(Tues.)	LAB EXAM (15, 16, 19) (8:15 a.m. - 9:30 a.m. and 9:30 a.m. - 10:45 a.m.)	

BIO 141 laboratory meets in Pierce 125

+These assignments are not handed in.

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.


Course Objectives. In Biology 141 students are introduced to basic concepts in biology following the hierarchy of life from basic biological molecules, to cell structure and function, fundamentals of genetics, evolution and organismal diversity (specifically plants). Students will master detailed information within the broad themes of unity and diversity, structure and function, and evolution.

The laboratory component of the course emphasizes student use of scientific methods of inquiry, fundamental concepts and techniques in biology, and communicating scientific results through laboratory presentations and scientific writing.

Some tips for studying: Biology 141 is an intensive course and requires time. If you are an average reader, you should spend about 8 hours a week outside class working in BIO 141. To perform well in this course, you must be diligent about the following:

 Keep up with assigned readings. The readings listed for each lecture in the syllabus must be done BEFORE the lecture. The best overall study **approach is to read assignments over quickly at first for an overview. Then read more carefully, jotting down questions or areas of confusion for later checking and review.**

 Take good notes. In lecture, I will explain the most significant concepts from your readings. At times, I will present examples that may not be given in your textbook. You are responsible for all of this information.

 Connect the lecture notes to your readings. For the test, you are responsible for information in the textbook as well as the lecture notes. Make sure that you are able to grasp the major concepts thoroughly and in detail.

🦋 Study the diagrams in your text and lecture handouts. Practice writing out pathways and link the concepts. It is helpful to **prepare your own tables and diagrams** as a study aid and review for much of the material in BIO 141.

🦋 While studying, keep two things in mind: One is to learn terminology and most importantly, understand the relevance of that terminology to biological function. Second – it is crucial to remember that this course is designed to make you think and not just to have you memorize facts. Memorizing facts is important to establish a basis for your knowledge but it is not sufficient. You must be able to use your knowledge to think logically and analytically. Many of the test questions will revolve around applying your knowledge. Therefore you should be confident of what you know and what it means.

🦋 One problem for some 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!

Supplemental Instruction. is provided for all students in BIO 141. The instructor will explain this important program that provides assistance for all students who wish to improve their performance in biology.

Examinations. The lecture exams will be a combination of multiple choice, short answer and short essay questions. Exams will cover all material covered in lecture in addition to assigned readings in the text. The final examination is comprehensive. Students should feel free to ask for clarification about any question during the exams.

Scientific Writing and Laboratory Project. Students will write one section of a scientific paper for four laboratory exercises. Students will propose and implement an independent investigation as a research project. For this laboratory, they will prepare a symposium presentation and write a complete scientific paper. Specific instructions will be provided in lab.

Honor Code. All examinations and work for credit in this course come under the regulations of the Honor Code. Your signature on your work attests to your upholding the Honor Code.

Absences. The policy on absences is provided in a separate handout. Unexcused absences or a failure to follow the procedures outlined in that handout will result in a reduction in your grade. Any questions about absences should be asked immediately.

Evaluation. Students are evaluated on their performance in the classroom and laboratory. The assignment of points will be:

300 points	3 lecture exams
150 points	3 laboratory exams
175 points	final examination
25 points	scientific writing
65 points	lab project

715 points	total
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Final grade determination:

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

Plus and minus grades are given.

08/03