

# ***Biology 141 General Biology I***

## ***Syllabus***

### ***Spring Semester 2005***

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**Professor:** Dr. M. Eloise Brown Carter

**Office:** Pierce Hall #105

**Phone:** (770)784-8343

**Lecture Hours:** Monday, Wednesday, Friday 10:40 a.m. – 11:30 p.m. **Room:** Pierce 102

**Lab Hours:** Wednesday 2:00 – 5:00 p.m. **Room:** Pierce 125

**Office Hours:** Monday and Wednesday - 11:45 to 12:30 p.m.. *On Wednesdays, Dr. Carter will be available for office hours on the Green or in the Hoke O'Kelly Library.* 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*, 4<sup>th</sup> 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.

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			<b>Chapters</b>
Jan.	19	Science as a Way of Knowing	1
	21	Major themes in Biology	1
	24	Hierarchies: beginning with living chemistry and water	2,3
	26	Building biological macromolecules: carbohydrates and lipids	4,5
	28	Proteins and nucleic acids	4,5
	31	Structure and function revealed in cells	7
Feb.	4	Cellular Case Studies	
	7	Membrane structure and cellular transport	8
	9	Transport problems	
Thurs., 10 <sup>th</sup> 8:15 - 9:30 am <i>Scientific Literature and Research</i>			
<i>Meet in the Pierce 206 (Required)</i>			
	11	Fundamentals of energy transformations: enzymes, ATP and electron carriers	6

14	Cellular respiration I - Glycolysis	9
<b>15(Tues.)</b>	<b>EXAM I 8:00 - 9:30 a.m. (through membrane transport)</b>	
16	Cellular respiration II - Transition and the Krebs Cycle	9
18	<i>Scientific Data Presentation - P206;</i> <i>Discussion of Research Projects</i>	
21	Cellular respiration III - Chemiosmosis and the Electron Transport System	9
23	Review and recapitulation: Accounting Day	
25	Homage to photosynthesis; <i>Research proposals due in class and LL</i>	10
28	Photosynthesis I: the light dependent reactions	10
March 2	Photosynthesis II: the light independent reactions and variations (C4 and CAM)	10
4	Cell reproduction: cell cycle, mitosis	12
7	Sexual reproduction: meiosis	13
<b>8 (Tues.)</b>	<b>EXAM II – 8:00 – 9:30 a.m. (through photosynthesis)</b>	
Thurs, 10th	8:15- 9:30 p.m. Power Point Workshop - P206	
9	Chromosomal mutations and gametogenesis	13, 15 pp. 279-283
11	Mendelian inheritance	14
14-18	<b>***SPRING BREAK***</b>	
21	Understanding the basis of inheritance	14,15
23	The buffet of genetic expression	14,15
25	DNA structure	16
28	DNA replication	16
30	Gene to Protein I: transcription and the genetic code	17
April 1	Gene to Protein II: translation and genetic mutations <i>Writing Workshop 2:00 Library</i>	17
4	Gene regulation <i>Research papers due in class</i>	19, pp. 362-365; 367-368
6	Review and recapitulation: Genetics	
8	Charles Darwin and development of evolutionary concepts	22
11	Evidence for evolution	22,25, pp. 484-494
<b>12(Tues)</b>	<b>EXAM III - 8:00 – 9:30 a.m. (through genetics)</b>	
13	Population Genetics and Hardy Weinberg	23
15	Microevolution: genetic drift, gene flow and mutation	23

18	Genetic variation and selection	23
20	Case Study – Evolution and population genetics	
22	Adaptation to the land environment	29
25	Bryophytes and seedless vascular plants	29
27	Seed plants: gymnosperms and angiosperms	30, 38 p. 783-788 p. 789-793
29	The reason for a flower	
May 2	The Big Themes Revisited	

**\*\*\* FINAL EXAMINATION\*\*\* Friday, May 6<sup>th</sup>, 2005 - 2:00 p.m. - 5:00 p.m.**

**BIOLOGY 141**  
**LABORATORY SCHEDULE**  
**SPRING 2005**  
**Dr. Eloise Carter**

<u><b>Date</b></u>	<u><b>Lab Topic (#)</b></u>	<u><b>Writing Assignment</b></u>
Jan. 26	Scientific Investigation (1)	Title page; Materials and Methods
Feb. 2	Microscopes and Cells (3)	Review table+ Library reserve
9	Diffusion and Osmosis (4)	Introduction, References
16	Enzymes (2)	Results; Figure and table
<b>22(Tues.)</b>	<b>LAB EXAM</b> (1,2,3,4) (8:15 - 9:30 a.m.)	
23	Photosynthesis (6)	Discussion; References
March 2	Cellular Respiration (5) Research Project	Proposal due 2/25 in class
9	Mitosis and Meiosis (7)	Comparison table+
16	<b>***SPRING BREAK***</b>	
23	Research Symposium	
<b>29(Tues.)</b>	<b>LAB EXAM</b> (5, 6, 7) (8:15 a.m. – 9:30 a.m.)	
30	Molecular Biology (10)	Map+
April 6	Evolution and Ecology o the Rocks	
13	Plant Diversity I: Bryophytes and Seedless Vascular Plants (15)	Outline+
20	Plant Diversity II: Seed Plants (16)	Outline+
<b>27(Wed.)</b>	<b>LAB EXAM</b> (0utcrops, 15, 16) (3:00 p.m. – 4:30 p.m.)	

+These assignments are not turned in for a grade.

## STUDENT'S GUIDE TO BIOLOGY 141

Welcome to Biology 141! The information in this handout and accompanying materials should 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. This may be one of the more difficult courses you will take, demanding that you not only learn and apply complex 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 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. Students participate in an independent team research project: proposal, research, symposium and scientific paper.

This is a **writing intensive course**. Simply put: you will write to learn, write to communicate, write to evaluate and write to create.


**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.

 *Memorize and think.* 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. Many of the test questions will revolve around applying your knowledge. Therefore you should be confident of what you know and what it means.

 *Be an active learner.* Develop study guides, comparison charts, concept maps (see Study Guide). Use the CD Study Guide. Attend Supplemental Instruction and organize an active study group. **Don't be lulled into thinking familiarity is the same as knowledge.** The latter takes hard work!

 *Be prepared for laboratory and invest time and effort in lab each week.* Read the lab and review terminology and diagrams before lab each week. During lab complete all components of the lab. After lab review the objectives, answer all questions and prepare a study guide for the lab materials.

**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
30 points	scientific writing
60 points	lab project

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715 points    total

Final grade determination:

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

Plus and minus grades are given.

01/05

**NOTE: A student must earn a C or higher in the course to receive credit for the sophomore writing requirement. (A C- does not satisfy the requirement.)**