

Biology 141 – Introductory Biology I
Course Syllabus
Fall 2003

Faculty Information: Dr. Nitya Jacob, *Office:* Room 104, Pierce Hall; *Phone:* 770-784-8346
Office Hours: TTh 9:30-10:30 AM or by appointment at other times
Email: njacob@learnlink.emory.edu

Lecture: MWF 8:30-9:20 AM, Room 102, Pierce Hall

Laboratory: Wednesday 2:00-5:00 PM, Room 125, Pierce Hall

Required Textbooks: **1)** *Biology*, N.A. Campbell and J. B. Reese. 2002. Sixth edition. Benjamin/Cummings Publishing Co., Inc. An accompanying Study Guide is also available for purchase at the bookstore and is on reserve in the library.
2) Lab Text: *Investigating Biology*, Judith G. Morgan and M. Eloise Brown Carter. 2002. Fourth edition. Benjamin/Cummings Publishing Co., Inc. *Used lab manuals may not be utilized.*

Optional Lab Supplement: *A Guide to Biology Lab*, T. G, Rust. Southwest Educational Ent.

Lecture Schedule

Date	Topic	Assigned Reading
W, Aug 27	Science as a way of knowing	Chapter 1
F, Aug 29	Biological organisms: Major themes	Chapter 1
M, Sep 1	LABOR DAY - no class	
W, Sep. 3	The chemical essentials: water	Chapters 2 and 3
F, Sep 5	The chemical essentials: carbon	Chapter 4
	Macromolecules – carbohydrates and lipids	Chapter 5
M, Sep 8	Macromolecules – proteins and nucleic acids	Chapter 5
Tues, Sep 9	8:15-9:30 am <i>Scientific literature and research</i> <i>Meet in Pierce 206</i>	
W, Sep 10	The Cell: Structure and function	Chapter 7
F, Sep 13	Cell membrane structure	Chapter 8
M, Sep 16	Cell membrane transport	Chapter 8
W, Sep 18	The source of cellular energy	Chapter 6
Thurs, Sep 18	EXAM I : 8:00-9:30 AM (covers through membrane transport)	
F, Sep 19	Cellular respiration I – glycolysis	Chapter 9

Lecture Schedule (continued)

Date	Topic	Assigned Reading
M, Sep 22	Cellular respiration II – Transition and Krebs cycle	Chapter 9
<i>Tues, Sep 23</i>	<i>8:15-9:30 am Scientific data presentation Meet in Pierce 206</i>	
W, Sep 24	Cellular respiration III – Chemiosmosis and Electron Transport Chain	Chapter 9
F, Sep 26	Review and recapitulation	
M, Sep 29	The importance of photosynthesis	Chapter 10
W, Oct 1	Photosynthesis I: Light-dependent reactions	Chapter 10
F, Oct 3	Photosynthesis II: Light-independent reactions Variant forms of photosynthesis (C4, CAM)	Chapter 10
M, Oct 6	Review and recapitulation	
W, Oct 8	Cell duplication: Mitosis cell cycle	Chapter 12
F, Oct 10	Cell duplication: Sexual reproduction, meiosis	Chapter 13
M, Oct 13	FALL BREAK – no class	
W, Oct 15	Chromosomal mutations and gametogenesis	Chapters 13, 14
Thurs, Oct 16	EXAM II : 8:00-9:30 AM (covers through photosynthesis)	
F, Oct 17	Inheritance according to Mendel	Chapter 14
M, Oct 20	The physical basis of inheritance	Chapters 14, 15
W, Oct. 22	An array of genetic phenomena	Chapters 14, 15
F, Oct 24	DNA structure and replication	Chapter 16
M, Oct 27	Gene to Protein I: transcription and genetic code	Chapter 17
W, Oct 29	Gene to Protein II: translation and genetic mutations	Chapter 17
F, Oct 31	Control of gene expression	Chapter 19: p.362-365; 367-368
M, Nov 3	Review and recapitulation: genetics	
W, Nov 5	Charles Darwin and the changing paradigm	Chapter 22
F, Nov 7	Evidence for evolution	Chapters 22 Chap 25: p. 484-494
M, Nov 10	Molecular evolution	Chap 25: p. 497-499
Tues, Nov 11	EXAM III : 8:00-9:30 AM (covers through genetics)	
W, Nov 12	Bryophytes and seedless vascular plants	Chapter 29
F, Nov 14	Sexual reproduction in seed plants	Chapters 30 Chap 38: p. 783-788; 789-793

Lecture Schedule (continued)

<u>Date</u>	<u>Topic</u>	<u>Assigned Reading</u>
M, Nov 17	Review of plant evolution	
W, Nov. 19	Plant structure and function	Chap 35: p.720-738
F, Nov 21	Transport in plants	Chap 36: p. 752-764
M, Nov 24	Ecology I: Case Study I	Ch 52: p. 1156-1171 Ch 53: p. 1174-1184 p. 1186-1191
W, Nov 26	THANSGIVING BREAK – no class	
F, Nov 28	THANKSGIVING BREAK – no class	
M, Dec 1	Ecology II: Case Study II	Chapter 54
W, Dec 3	Ecology III: Ecological concepts, carbon cycle	Chapter 54
F, Dec 5	Ecology IV: review and recapitulation	
M, Dec 8	Re-visiting the big themes	

***** FINAL EXAMINATION***Thursday, December 11, 9:00 a.m. to 12:00 noon**

Syllabus continues on next page

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.)	

+These assignments are not handed in. BIO 141 laboratory meets in Pierce 125.

STUDENT'S GUIDE TO BIOLOGY 141

Welcome to Biology 141! Please read and follow the information in this handout and any accompanying materials. You are responsible for understanding all the information presented here, so please ask for clarification if needed.

Course Objectives: The purpose of this course is to give you, the student, a firm foundation in biology. To study living organisms, the knowledge of cell structure and function is vital. Firstly, I would like you to develop an understanding of how basic molecules make up the structure of a cell and how these molecules govern cell function. Secondly, this course will help you comprehend crucial tasks conducted by cells, particularly how cells transport components across membranes, and how energy is generated within cells. Thirdly, you will learn the basic mechanisms of cell duplication, inheritance of biological traits and processing of genetic information. A fourth objective of this course is to introduce you to the concepts of evolution, ecological communities, and diversity in the biological world. Finally, a very important objective of this course is teaching you to “think like a scientist” through methods of scientific inquiry and the practice of deductive reasoning. Both lecture and laboratory are designed to accomplish the above goals. Upon grasping these fundamental themes of biology, you will be prepared to further probe into more intricate and specialized areas of this field.

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. The course demands that you learn detailed and complicated information, organize this information within the major concepts of biology, and apply your knowledge. In other biology courses your competence in basic biology will be assumed, therefore it is crucial for you to succeed in this course. Many of you will be taking examinations to enter graduate or professional schools, and the knowledge you will gain here will be required later.

Some tips for studying: Biology 141 is an intensive course and requires time. To perform well in this course, you must manage your time appropriately. You must have a proper study plan. The following are some good study habits that will help you succeed in Biology 141:

- ❖ Keep up with assigned readings. The readings listed against each lecture in the syllabus must be done BEFORE the lecture.
- ❖ 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. In addition, connect the concepts learned in lecture to the lab exercises.

- ❖ Study the diagrams in your text and lecture handouts. Practice writing out pathways and linking concepts.
- ❖ While studying, keep two things in mind: One - 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.
- ❖ The laboratory component of this course is intensive and requires time as well. Please read your lab manual BEFORE lab and pay attention to the details. Take good notes during the lab and take time to make good observations. Answer the questions in the lab manual. Make use of open lab time.

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

Absences: The policy on absences is provided in a separate handout. Unexcused absences in lecture, lab, examinations 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.

Examinations: The lecture exams will be a combination of multiple choice, short answer and short essay questions. Exams will cover all material in lecture in addition to assigned textbook readings. The final examination is comprehensive. If you have any doubts regarding the exams, please feel free to ask.

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

Honor Code: Regulations of the Honor Code apply to all work for credit in this course, including lecture and lab examinations. Please pledge all of your work with your signature to indicate that you have followed the rules of the Honor Code.

Office Hours: I would like to encourage you to meet with me in person about any concerns or questions that may arise during the semester. I have scheduled specific office hours but if these times are not suitable for you, please do not hesitate to make an appointment with me for a different time.

LearnLink Class Conference: A class conference labeled “Jacob 141” has been set up for this course on LearnLink. Please use the conference regularly to communicate with each other and to ask questions. I will use this conference to correspond with you about items we may have missed in class or lab. The syllabus and weekly lab instructions will also be posted under the Biology 141 conference – check the folders.

Evaluation: Students are evaluated on their performance in the classroom and the laboratory. The following is the distribution of points:

Lecture exams (3)	300 points
Laboratory exams (3)	150 points
Final exam	175 points
Scientific writing	25 points
Lab project	<u>65 points</u>
Total	715 points

Final grade determination

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

Plus and minus grades are given