

Biology 141 – Introductory Biology I
Course Syllabus
Fall 2002

Faculty Information: Dr. Nitya Jacob, *Office:* Room 104, Pierce Hall; *Phone:* 770-784-8346
Office Hours: TTh 9:30-10:30 AM, W: 2:00-3:00 PM or by appointment
Email: njacob@learnlink.emory.edu

Lecture: MWF 9:35-10:25 AM, Room 102, Pierce Hall

Laboratory: Tuesday 2:30-5:30 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 28	Science as a way of knowing	Chapter 1
F, Aug 30	Major themes in studying biology	Chapter 1
M, Sep 2	LABOR DAY - no class	
W, Sep. 4	The chemistry of biology	Chapters 2 and 3
F, Sep 6	Importance of carbon	Chapter 4
	Macromolecules – carbohydrates and lipids	Chapter 5
M, Sep 9	Macromolecules – proteins and nucleic acids	Chapter 5
W, Sep 11	Structure and function of cells	Chapter 7
Thurs, Sep 12	8:15-9:30 am <i>Scientific literature and research</i> <i>Meet in the Humanities Multi Media Lab</i>	
F, Sep 13	Cellular membranes	Chapter 8
M, Sep 16	Transport through membranes	Chapter 8
W, Sep 18	The source of cellular energy	Chapter 6
Thurs, Sep 19	EXAM I : 8:00-9:30 AM (covers through membrane transport)	
F, Sep 20	Cellular respiration I – glycolysis	Chapter 9

Lecture Schedule (continued)

Date	Topic	Assigned Reading
M, Sep 23	Cellular respiration II – Transition and Krebs cycle	Chapter 9
W, Sep 25	Cellular respiration III – Chemiosmosis and Electron Transport Chain	Chapter 9
Thurs, Sep 26	8:15-9:30 am Scientific data presentation Meet in Pierce 120	
F, Sep 27	Review and recapitulation	
M, Sep 30	The importance of photosynthesis	Chapter 10
W, Oct 2	Photosynthesis I: Light-dependent reactions	Chapter 10
F, Oct 4	Photosynthesis II: Light-independent reactions Variant forms of photosynthesis (C4, CAM)	Chapter 10
M, Oct 7	Review and recapitulation	
W, Oct 9	Cell duplication: Mitosis cell cycle	Chapter 12
F, Oct 11	Cell duplication: Sexual reproduction, meiosis	Chapter 13
M, Oct 14	FALL BREAK – no class	
W, Oct 16	Chromosomal mutations and gametogenesis	Chapters 13, 14
Thurs, Oct 17	EXAM II : 8:00-9:30 AM (covers through photosynthesis)	
F, Oct 18	Inheritance according to Mendel	Chapter 14
M, Oct 21	The physical basis of inheritance	Chapters 14, 15
W, Oct. 23	An array of genetic phenomena	Chapters 14, 15
F, Oct 25	DNA structure and replication	Chapter 16
M, Oct 28	Gene to Protein I: transcription and genetic code	Chapter 17
W, Oct 30	Gene to Protein II: translation and genetic mutations	Chapter 17
F, Nov 1	Control of gene expression	Chapter 19
M, Nov 4	Review and recapitulation: genetics	
W, Nov 6	Charles Darwin and the changing paradigm	Chapter 22
Thurs, Nov 7	EXAM III : 8:00-9:30 AM (covers through genetics)	
F, Nov 8	Evidence for evolution	Chapters 22, 24, 25
M, Nov 11	Molecular evolution	Chapter 25
W, Nov 13	Bryophytes and seedless vascular plants	Chapter 29
F, Nov 15	Sexual reproduction in seed plants	Chapters 30, 38

Lecture Schedule (continued)

Date	Topic	Assigned Reading
M, Nov 18	Review of plant evolution	
W, Nov. 20	Plant structure and function	Chapter 35
F, Nov 22	Transport in plants	Chapter 36
M, Nov 25	Ecology I: population and community dynamics	Chapters 52, 53
W, Nov 27	THANSGIVING BREAK – no class	
F, Nov 29	THANKSGIVING BREAK – no class	
M, Dec 2	Ecology II: ecosystem structure and function	Chapter 54
W, Dec 4	Ecology III: nutrient recycling	Chapter 54
F, Dec 6	Ecology IV: review and recapitulation	
M, Dec 9	Revising the big themes	

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

Syllabus continues on next page

Biology 141 – Introductory Biology I
Laboratory Schedule – Fall 2002
Dr. Eloise Carter
Dr. Nitya Jacob

Date	Topic	#	Writing Assignment
Sep 3, 5*	Scientific Investigation	1	Introduction
Sep 9, 10	Microscopes and Cells	3	Review table, Library reserve+
Sep 16, 17	Diffusion and Osmosis	4	Materials and Methods
Sep 23, 24	Enzymes	2	Results, Figures and Table
Sep 30, Oct 1	Cellular Respiration	5	Discussion
Thurs, Oct 3	LAB EXAM I – 1, 2, 3 4		(8:15-9:30 AM; 9:30-10:45 AM)
Oct 7, 8	Photosynthesis	6	
Oct 14, 15	Fall Break		No lab
Oct 21, 22	Research Project Plant Development	20	Proposals, List of Materials
Oct 28, 29	Mitosis and Meiosis	7	Comparsion table +, Questions
Thurs, Oct. 31	LAB EXAM II – 5, 6, 7		(8:15-9:30 AM; 9:30-10:45 AM)
Nov 4, 5	Research Symposium		Scientific Presentation and Paper
Nov 11, 12	Plant Diversity I: Bryophytes and Seedless Vascular Plants	15	Papers due Outline +
Nov 18, 19	Plant Diversity II: Seed Plants	16	Outline +
Nov 25, 26	THANKSGIVING BREAK		
Dec 2, 3	Plant Anatomy	19	Review table +
Tues, Dec 10	LAB FINAL EXAM - 15, 16, 19		(8:15-9:30 AM; 9:30-10:45 AM)

*Monday lab will meet on Thursday morning (9/3) from 8-10 am this week only due to Labor Day.

+ These assignments are not handed in

STUDENT'S GUIDE TO BIOLOGY 141

Welcome to Biology 141! All students in this class must read and follow the information in this handout and any accompanying materials. Please ask for clarification if any part of this handout is unclear.

Course Objectives: The purpose of this course focuses on giving you, the student, a firm foundation in biology. To study life, be it human or otherwise, the knowledge of cell structure and function is vital. The ability to reproduce and maintain diversity are two other essential characteristics of a living organism. Through this course, 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 mechanism of cell duplication and sexual reproduction leading you to develop concepts of how biological traits are inherited. A fourth objective of this course is to give you an understanding of evolution, the role of environment, and the importance of diversity in the biological world, using the plant kingdom as an example. The final and a very important objective of this course is to introduce you to “think like a scientist” through methods of scientific inquiry and exercising 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.

More about Biology 141, Introductory Biology: This course 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 detailed and complicated information, but that you will 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 will gain here will be required later.

Some tips for studying: Biology 141 is an intensive course and requires time. It is very important that you keep up with the assigned readings and that you review lecture notes on a regular basis. The suggestions made here will greatly benefit your learning process. Before coming to class or lab, read the assigned chapter(s) and write down key principles of each chapter and find functional examples in the textbook to explain those principles. During lecture and lab, take thorough and careful notes and be sure to note how one point relates to the next. After a particular topic is covered in lecture and/or lab, review your textbook reading once again, this time with your lecture and lab notes at hand. Answer questions in the book and the study guide. Make sure you learn

terminology and most importantly, you should understand the relevance of that terminology to biological function. Learn the diagrams in your text and lecture handouts and practice drawing your own diagrams and making tables. A good strategy to test your knowledge is to imagine that you are the teacher and explain the concepts to another classmate. Write down any questions that come up and make sure you clarify your doubts with me. These study habits require time and cannot be done the night before an exam.

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. To really master principles in biology, you must be able to understand concepts and be able to apply them to situations you may not have encountered before. For example, if one player in a biological phenomenon is removed, you must be able to logically explain how that phenomenon would change as a result. Exercises during lecture, labs and exams will help you become comfortable with thinking in this manner. Studying in advance and practicing this type of thinking outside of class is the key to your success in this course.

I would like to make this course a productive and enjoyable learning experience for you. Please do not hesitate to approach me with questions or difficulties.

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.

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. Students should feel free to ask me about any questions on the exam which are unclear.

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: 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 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