

ABIO 101 BIOLOGICAL SCIENCE I

Syllabus

Fall 2001

Instructor:	Dr. William H. Jackson	Office Hours:	By appointment
Office:	SBDG 111B	Email:	Billj@aiken.sc.edu
Telephone:	641-3601	Laboratory:	TTH, 1:40-4:30PM; W, 8:00-10:40 in SBDG 108
Lecture:	TTH, 10:50AM-12:05PM in SBDG 327	Lab Manual:	Biology 101 Laboratory Manual, 2nd Ed. by Jackson and Yates
Text:	Biology, 6th Ed. by Raven and Johnson	Information:	http://www.usca.sc.edu/biogeofaculty/Jackson/Bio101/bio101.html
Supplies:	Scantron Sheets and Quad-ruled laboratory notebook obtainable from the USCA Bookstore		
Credit:	Four (4) Semester Hours		

Course Description: A study of the biological principles and concepts through the cellular level of organization including evolutionary processes.

Course Objectives: This course will introduce the student to the underlying principles governing the science of biology. Its primary emphasis will be on cellular processes and components. The concepts introduced in this course are intended to introduce majors and non-majors alike to the study of biology. Moreover, the laboratory experience is designed to introduce the student to the Scientific Method as a means of problem solving and consists of both open- and closed-end exercises. Initial laboratory exercises will introduce the student to concepts and techniques that will be useful in completing more open-ended experiments. These will require the student to think critically, develop experiments, analyze data, and present data in a scientific format. Upon completion of this course students will be expected to

1. Describe the major biological compounds and their utilization by cells;
2. Describe the structure of prokaryotic and eukaryotic cells and how structure facilitates function;
3. Discuss energy flow in biological systems;
4. Describe general protein structure;
5. Discuss the role of enzymes in metabolism;
6. Discuss cell signaling and the various mechanisms of cell signaling;
7. Discuss the importance of nucleic acids in biological systems and the nature of DNA replication;
8. Describe the nature of genes and gene expression;
9. Discuss heredity as it pertains to patterns of inheritance and genetic variation.

Attendance Policy: Students should refer to the USCA Student Handbook regarding the number of absences permitted. In this regard, the instructor may impose a penalty for absences in excess of 25% of regularly scheduled class meetings by assigning an "F" for the course. Absences, *neither excused nor unexcused*, absolve the student from meeting class assignments. Because of their nature, laboratory exercises cannot be made up – therefore students should make every effort to attend laboratory sessions. Exam make-ups will only be allowed for a *documented, excusable* reason.

Disability Statement: If you have a physical, psychological, and/or learning disability which might affect your performance in this class, please contact the Office of Disability Services, 126A B&E, (803) 641-3609, as soon as possible. The Disability Services Office will determine appropriate accommodations based on medical documentation.

Methods of Presentation and Evaluation: Information will be presented through lectures along with appropriate visual aids. Students will be required to turn in seven critiques of scientific journal articles as a record of outside readings. Articles should be taken from the following groups of journals found in the USCA Library: four from Group 1 (research articles and reviews): **Blood, Cell, Nature, Science, and Trends in Genetics**; two from Group 2 (science news and views): **Science News** and **Discover**; and one from Group 3 (science in education): **American Biology Teacher**, and **Science Teacher**. Each summary must be typewritten, double-spaced, referenced, and consist of at least one paragraph describing the nature of the paper and at least a one paragraph critique. Traditional exams will be used to further evaluate student progress in the class. The basis of student evaluation is shown below.

Laboratory: Each student will be required to purchase and maintain an appropriate laboratory notebook. Laboratory notebooks can be obtained in the USCA Bookstore. The laboratory notebook should be bound

and the pages should be in the form of a grid (NOTE: a spiral notebook is not considered to be an appropriate laboratory notebook). All notes and records from each laboratory exercise should be kept in this book. Laboratory notebooks will be turned in at the end of the semester. Other components of the laboratory grade will be from weekly lecture/laboratory exams and a final exam.

Description	Percentage	Comments
Three Hourly Exams	48%	16% Each
Final Exam	17%	Comprehensive
Laboratory Grade	25%	Composed of weekly lab quizzes (45%), written laboratory reports (30%), and laboratory notebooks (25%)
Class Participation	10%	Readings and other material

The grading scale is a sliding scale that is based on the mean (average) of the class as a whole. The class mean is a mark that is set as a "C". Because the class mean is constantly changing, I do not calculate individual grades until the end of the semester. However, certain facts remain. (a) Students with scores around the mean are working at the "C" level. (b) Students with scores consistently higher than the mean are satisfactory (how satisfactory depends on the score). (c) Students with scores consistently lower than the mean are doing less well (how poorly depends on the score).

TENTATIVE LECTURE SCHEDULE

DATE	WEEK	TOPIC	CHAPTERS
Aug 20	1	The Science of Biology / The Nature of Molecules The Nature of Molecules (cont.)	1, 2 2
Aug 27	2	The Chemical Building Blocks of Life	3
Sep 3	3	The Origin and Early History of Life Cell Structure	4 5
Sep 10	4	Exam 1 (Chapters 1- 4) Cell Structure	5
Sep 17	5	Membranes	6
Sep 24	6	Energy and Metabolism	8
Oct 1	7	How Cells Harvest Energy	9
Oct 8	8	How Cells Harvest Energy EXAM II (Chapters 5 – 8)	9
Oct 15	9	Photosynthesis	10
Oct 22	10	How Cells Divide	11
Oct 29	11	Sexual Reproduction and Meiosis Patterns of Inheritance	12 13
Nov 5	12	Patterns of Inheritance EXAM III (Chapters 9 – 13)	13
Nov 12	13	Patterns of Inheritance DNA: The Genetic Material	13 14
Nov 19	14	DNA: The Genetic Material Genes and How They Work	14 15
Nov 26	15	Genes and How They Work	15
Dec 6		FINAL EXAM (Cumulative) at 11:00AM	

TENTATIVE LABORATORY SCHEDULE

Week	TOPIC	
Aug 20	Introduction to the Laboratory	
Aug 27	Measurement Techniques	
Sep 3	Introduction to the laboratory write-up (Measurement Techniques)	
Sep 10	Organic Molecules in Cells	
Sep 17	Write-up laboratory results for Organic Molecules	
Sep 24	Cells and Microscopy	
Oct 1	Write-up laboratory results for Cells and Microscopy	
Oct 8	No Laboratory	
Oct 15	Enzymes	
Oct 22	Write-up laboratory results for Enzymes	
Oct 29	Photosynthesis	
Nov 5	Write-up laboratory results for Photosynthesis/ Mitosis	
Nov 12	Chi-Square and Corn Genetics	
Nov 19	No Laboratory	
Nov 26	Write-up laboratory results from Chi-square and corn genetics	

Laboratory Practical Quizzes. These quizzes will be given on approximately every other week beginning with the week of September 3 (other dates are shown above in bold). These quizzes will cover all of the topics covered during the semester in the laboratory. The student should prepare for each quiz by taking good notes during the laboratory, answering questions in the laboratory manual, and keeping a well-documented laboratory notebook.

REFERENCE EXAMPLE:

Jackson, WH, Jr., H Moscoso, JF Nechtman, DS Galileo, FA Garver, and KD Lanclos. (1998). Inhibition of HIV-1 replication by an anti-tat hammerhead ribozyme. *Biochem. Biophys. Res. Commun.* 245:81-84.

1. Write the authors name as they appear in the journal. Write only the first authors last name first.
2. Write the year of the journal in parentheses followed by a period.
3. Write the title of the paper, capitalizing only the first word unless internal words should be capitalized (e.g., HIV above)
4. Write the name of the journal.
5. Write the volume of the journal followed by a colon. If the volume number is given, write the number in parentheses following the volume number and before the colon (e.g., 245 (2):)
6. Write the pages that the article occupies in the journal.
7. End the reference with a period.