

Fayetteville State University  
College of Arts and Sciences  
Department of Biological Sciences  
BIOL 150-03, Principles of Biology, Fall/2011

## I. Locator Information:

Instructor: Dr. Eid E. Haddad

Office Location: TBA

Office hours: M 10:30 AM – 11:30 AM  
W 03:30 PM – 04:30 PM

Email address: [ehaddad@uncfsu.edu](mailto:ehaddad@uncfsu.edu)

Office Phone: TBA

Semester Credit Hours: 4

Day and Time Classes Meet:

Class	2:00 pm – 3:15 PM	MW	Lyons Science 109	Aug 18, 2011 – Dec 09, 2011
Lab	3:30 PM – 5:20 PM	M	Lyons Science 114	Aug 18, 2011 – Dec 09, 2011

**FSU Policy on Electronic Mail:** Fayetteville State University provides to each student, free of charge, an electronic mail account that is easily accessible via the Internet. The university has established email as the primary mode of communicating with enrolled students about impending deadlines, upcoming events, and other information important to student progression at the university. Students are responsible for reading their email on a regular basis to remain aware of important information disseminated by the university. The university maintains open-use computer laboratories throughout the campus that can be used to access electronic mail. Students making inquiries via email to FSU faculty and staff about academic records, grades, bills, financial aid, and other matters of a confidential nature are required to use their FSU email account. Rules and regulations governing the use of FSU email may be found at: <http://www.uncfsu.edu/PDFs/EmailPolicyFinal.pdf>

**II. Course Description:** BIOL 150 (Principles of Biology) is a study of the major principles relating to the nature of organisms, with emphasis on molecular, cellular, organismic, developmental, and evolutionary concepts, and with two (2) hours of lab consisting of experiments on the analysis of the chemistry of cellular and related materials. This course requires a Prerequisite or Co-requisite of Math 123 or higher level math courses.

**III. Disabled Student Services:** In accordance with Section 504 of the 1973 Rehabilitation Act and the Americans with Disabilities Act (ACA) of 1990, if you have a disability or think you have a disability to please contact the Center for Personal Development in the Spaulding Building, Room 155 (1st Floor); 910-672-1203.

## IV. TEXTBOOK & LABORATORY MANUAL:

Campbell Biology, 9<sup>th</sup> Edition, Benjamin Cummings., 2011.

*Vodopich and Random Moore*. Biology Laboratory Manual 9<sup>th</sup>. Edition, McGraw-Hill Companies, Inc. 2011.

**Student Learning Outcomes Upon completion of this course, students will be able to:**

1. Demonstrate knowledge of hierarchy of life, traits of classified organisms, cells and cell theory, chemical and physical properties of life, energy laws and processes,

macromolecules, concepts in reproduction, molecular basis of genetics, and evidence/mechanisms of evolution during exams, quizzes, and written assignments.

2. Demonstrate familiarity with the use of specific lab tools and equipment, such as a compound microscope, and UV spectrophotometer as evidenced through a lab practical and lab assignments.
3. Demonstrate proficiency in utilizing a computer for data analysis and communication (Excel, Word) as evidenced in lab reports.
4. Communicate using standard scientific format using lab reports as a means to demonstrate their ability to communicate scientific information.
5. Apply the scientific process, including conducting experiments and testing hypotheses during lab assignments and submission of lab reports.

**Course Objectives and Course DPI/ NCATE Competencies:** DPI enclosed in ( ) NCATE enclosed in [ ] The proposed behavioral objectives for BIOLOGY 150 course are as follows:

The student:

**Demonstrates knowledge of each of the five kingdoms of life.**

1. Knows the main characteristics that distinguish viruses from bacteria and bacteria from Protista. (6.1,1.1) [1.2, 1.9]
2. Understands the harmful and beneficial effects of microorganisms (4.1, 1.10) [1.10]

**Demonstrates ability to interpret information and use the scientific method in problem solving situations.**

1. Applies the scientific method to appropriate problem situations by the use of observation and experiment. (1.4,1.2,3.3, 6.4) [3.0]
2. Arranges the major groups of organisms into distinct categories based on their general characteristics. (1.1) [1.9]

**Demonstrates understanding of the different kinds of cells, their organization and functioning.**

1. Contrasts the theory of spontaneous generation with the cell theory. (1.1, 1.5,) [1.2]
2. Relates the surface area to volume ratio of cells to their ability to carry on the life processes.(3.4) [1.2, 2.0]
3. Analyzes information about the different types of cells and determines their common characteristics. (3.4) [1.2, 1.5]
4. Illustrates the ways in which the prokaryotic cell differs from the eukaryotic cell. (1.1) [1.2, 1.9]

**Demonstrates understanding of the physical and biological processes responsible for the movement of water and solutes in living systems.**

1. Uses the Kinetic Molecular Theory to explain active and passive transport through cell membranes. (1.3) [1.3, 2.0]
2. Evaluates the effect of osmosis on different kinds of cells and tissues. (1.3, 1.1) [1.3, 2.3]
3. Assesses the effect of concentration gradients on the movement of water and ions in living systems. (1.1, 1.3) [ 2.3, 2.0]

**Shows the involvement of energy and the laws of energy in life processes.**

1. Illustrates the ways energy is transferred from one organic system to another. [1.3]
2. Evaluates the relationship between bond energy and stored chemical potential energy in organic compounds. (1.3) [1.3]
3. Assesses the effect of various environmental factors such as temperature, pH and water on the action of enzymes. (4.1) [3.0, 2.0]
4. Compares and contrasts the process of photosynthesis with cellular respiration. [1.3]

**Applies theories of heredity to illustrate how genetic information is stored and transferred from one living unit to another.**

1. Contrasts the process of mitosis with meiosis in complex cells. (1.1) [1.6]
2. Assesses the effect of sexual and asexual reproduction on populations of organisms. (1.1) [1.6,1.7]
3. Uses the laws of genetics to solve problems involving monohybrid and dihybrid crosses. [1.6]
4. Applies the laws of genetics to human inheritance of specific genetic abnormalities (1.3) [1.1]
5. Demonstrates an understanding of the ways genetic information is coded in and transcribed from DNA. (3.4) [1.6]
6. Illustrates the process of protein synthesis in a cell with DNA, RNA and cellular energy. (3.4) [1.6]
7. Understands genetic regulatory mechanisms used in bacteria and other organisms (3.4)1.2,1.4]

**V. Course Requirements and Evaluation Criteria** –Below are the grading criteria for the course. There are NO make-up quizzes and exams. The instructor reserves the right to make allowances under certain unavoidable circumstances. Students are expected to take all exams on the scheduled dates because excused absences do not excuse you from exams. A quiz should be expected at each class session. Final grades will be derived from a composite number of points earned during the course for the following activities:

<b>GRADING CRITERIA</b>	<b>POINTS</b>	<b>PERCENTAGE OF FINAL GRADE</b>
Exams (3 @ 100pts ea)	300	30%
Pre-lec. Assignments (i.e. homework)	100	10%
Post-Lec. Assignments/Quizzes	100	10%
Final Exam (Comprehensive)	100	10%
Lab Exercises / Reports / Research Paper	400	40%
<b>*TOTAL</b>	<b>*1000</b>	<b>100%</b>
Grade Percentage		
A 90-100%		
B 80-89%		
C 70-79%		
D 60-69%		
F ≤ 59%		
<b>*Number of total pts may vary. *The instructor reserves the right to modify the grading criteria as deemed necessary. Students will be notified of any such changes.</b>		

**Exams will consist of material from lecture discussion, reading, and other class assignments. The format of the tests will be a combination of multiple choice, true/false, matching, identification, definition, and short answer/essay questions. Tests will be administered during lecture time (or Blackboard) and you may expect them to take up the entire lecture session that day.**

**VI. COURSE REQUIREMENTS:** Students are required to take all exams on the date they are scheduled. Make-up exams will not be given unless the student presents a formal written excuse before the third class period following the initial date of the test or special arrangements have been made with your instructor prior to the exam date. Only in exceptional cases will any exceptions to these rules be made. As a student in this course, you are responsible for all work assigned, whether or not you are present. You are, of course, also expected to complete your assignments on time. Work handed in or reported late will receive a lower grade than that handed in on time. If you must be absent unavoidably, send your paper via a friend and ask that person to get your assignment, take notes for you, and pick up any handouts. You are also responsible for demonstrating (by means of make-up work or in class discussion) an understanding of content covered in class on the day of the absence. Students are required to attend all classes regularly and to keep appointments when they are scheduled. It is the responsibility of each student to be informed of the academic requirements of the instructor. An absence, excused or unexcused, does not relieve the student of any course requirement.

### **ATTENDANCE POLICY**

Students are required to read the University attendance policy very carefully. It will be enforced in all classes as follows.

**Class Attendance:** Although attendance and punctuality are not normally used in the calculation of the grade (see course requirements), there appears to be a direct correlation between these variables and final grades. Students who attend all classes, are punctual, and sit near the front of the room where they can hear and see better, tend to attain higher achievement than their peers. In this regard the more you can become actively involved in the class (study with classmates, participate in class discussions, and ask questions), the better you should do in the course.

## **FSU Policy on Disruptive Behavior in the Classroom (Optional)**

The *Code of the University of North Carolina* (of which FSU is a constituent institution) and the *FSU Code of Student Conduct* affirm that all students have the right to receive instruction without interference from other students who disrupt classes. FSU Core Curriculum Learning Outcome under Ethics and Civic Engagement (6.03): All students will “prepare themselves for responsible citizenship by fulfilling roles and responsibilities associated with membership in various organizations.” Each classroom is a mini- community. Students learn and demonstrate responsible citizenship by abiding by the rules of classroom behavior and respecting the rights all members of the class. The FSU Policy on Disruptive Behavior (see FSU website for complete policy) identifies the following behaviors as disruptive:

1. Failure to respect the rights of other students to express their viewpoints by behaviors such as repeatedly interrupting others while they speak, using profanity and/or disrespectful names or labels for others, ridiculing others for their viewpoints, and other similar behaviors;
2. Excessive talking to other students while the faculty member or other students are presenting information or expressing their viewpoints.
3. Use of cell phones and other electronic devices
4. Overt inattentiveness (sleeping, reading newspapers)
5. Eating in class (except as permitted by the faculty member)
6. Threats or statements that jeopardize the safety of the student and others
7. Failure to follow reasonable requests of faculty members
8. Entering class late or leaving class early on regular basis
9. Others as specified by the instructor.

The instructor may take the following actions in response to disruptive behavior. Students should recognize that refusing to comply with reasonable requests from the faculty member is another incidence of disruptive behavior.

1. Direct student to cease disruptive behavior.
2. Direct student to change seating locations.
3. Require student to have individual conference with faculty member. At his meeting the faculty member will explain the consequences of continued disruptive behavior.
4. Dismiss class for the remainder of the period. (Must be reported to department chair.)
5. Lower the student’s final exam by a maximum of one-letter grade.
6. File a complaint with the Dean of Students for more severe disciplinary action.

Students who believe the faculty member has unfairly applied the policy to them may make an appeal with the faculty member’s department chair.

**VII. Academic Support Resources** –Students who are earning less than a “C” average will be encouraged to attend tutorial sessions provided free by various units and centers below.

<http://www.uncfsu.edu/univcoll/services.asp>

<http://www.uncfsu.edu/learningcenter/>

<http://www.uncfsu.edu/sss/>

<http://www.uncfsu.edu/cpser/tutorialservices.htm>

Online tutoring is also available through  
 Smartthinking: <http://www.uncfsu.edu/fsuretention/smarthinkingflyer.pdf>

### VIII. COURSE OUTLINE WITH ASSIGNMENT SCHEDULE:

Date	Day	Lecture Topic	Campbell Reading (chapter)	Laboratory McGraw Lab Manual
Aug 22/24	M	Syllabus & Introduction	1	NO LAB
	W	The chemical context of life	2	
Aug 29/31	M	Water and life	3	Ch. 1 – Scientific methods
	W	Carbon and molecular diversity of life	4	
Sep 5/7	M	<b>No Class – Labor Day</b>		<b>No Lab – Labor Day</b>
	W	The structure and function of large biological molecules	5	
Sep 12/14	M	The structure and function of large biological molecules	5	Ch. 2 – Measurements
	W	A tour of the cell	6	
<b>Exam I (chapters 1-5)</b>				
Sep 19/21	M	A tour of the cell	6	Ch. 6 – Biological molecules
	W	Membrane structure and function	7	
Sep 26/28	M			Ch. 3 – The Microscope
	W	An introduction to metabolism	8	
Oct 3/5	M			Ch. 4 – The cell
	W	Cellular Respiration and fermentation	9	
Oct 10/12	M			Ch. 8 – Spectrophotometry
	W	Photosynthesis	10	
<b>Exam II (chapters 6-10)</b>				
Oct 17/19	M	<b>Midterm break</b>		<b>NO LAB/Fall break</b>
	W	Cell communication	11	
Oct 24/26	M	The cell cycle	12	Ch. 9 – Diffusion/Osmosis
	W	Meiosis & sexual life cycle	13	
Oct 31/Nov 2	M	Mendel and the gene idea	14	Ch. 10 – Cellular membranes
	W	The chromosomal bases	15	
<b>Exam III (chapters 11-15)</b>				
Nov 7/9	M			<b>NO LAB/Holiday</b>
	W	The molecular bases of inheritance	16	
Nov 14/16	M			Ch. 11 – Enzymes
	W	From Gene to protein	17	
Nov 21/23	M			<b>NO LAB/Holiday</b>
	W	Evolution	22	
Nov 28/30	M	Review		Review/Wrap-up/ ROC <sup>2</sup>
	W	<b>Final Exam Graduating Seniors<sup>1</sup></b>	-	
Dec 5/7	M	Review	-	
	W	<b>Final Exam ROC</b>	8:00 – 9:50 AM	

<sup>1</sup> Final exams are comprehensive

<sup>2</sup> ROC = Rest of Class

This is a tentative schedule. The instructor reserves the right to alter it at any time. It is your responsibility to be in class and check your blackboard page in order to keep pace with any changes made to the schedule or assignments.

**IX. TEACHING STRATEGIES** -The first part of each lecture period will consist of a question answer period over the previous material (lecture or laboratory) covered in the class. Questions will be asked and answered by both the instructor and the student. Emphasis will be placed on student understanding of basic concepts and principles. Students will work in small groups when conducting laboratory activities but will be expected to do their own assessment and final reports.

**WRITTEN ASSIGNMENTS (Writing-across-the-curriculum)**

In order to emphasize the importance of writing in the learning process this course will require the student to do a certain amount of written work. You will receive more information concerning this aspect of the course from your instructor the first week of classes.

**X. REFERENCES**

All general biology students are encouraged to use the library and to do supplemental reading in the biological sciences. The following science periodicals provide a source of current information in a format appropriate for both the major and non-major biology student.

1. Discover
2. Science Digest
3. Scientific American
4. Science
5. Science News
6. Nature
7. Natural History

In addition students should use the Internet to investigate topics of interest and to acquire pertinent information.