

Fayetteville State University
College of Arts and Sciences
Department of Biological Sciences
BIOL 150-02, Principles of Biology
Fall 2011

I. LOCATOR INFORMATION:**Instructor:** Dr. Khalid Lodhi**Course #:** Principles of Biology (BIOL 150-02)**Day and Time Class Meets:** TR**Day and Time Lab Meets:** R**Office hours:** MW: 1:00 to 3:00pm**Email address:** klodhi@uncfsu.edu**Office Location:** LSA 220**Semester Credit Hours:** 4

4:00- to 5:15 pm @ LSA 226

9:00 to 10:50 am @ LS 113

TR: 11:00 to 1:00pm

Office Phone: 672-1650

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 (4-3-2) Principles of Biology: 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.

Prerequisite: MATH 123 or higher level of MATH

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 & Reece. **Biology**. 9th. Edition,*

Benjamin Cummings., 2011.

ISBN-13: 978-0-321-55823-7

ISBN-10: 0-321-55823-5

*Vodopich and Random Moore. **Biology Laboratory Manual***

8th. Edition., McGraw-Hill Companies, Inc. 2010.

V. 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]

Understands the evidence and mechanisms for evolution.

1. Can give examples of convergent and divergent evolution (1.4, 1.1) [1.7]
2. Illustrates by means of example the process of coevolution and symbiosis. (1.1) [1.7, 1.11]
3. Differentiates between natural and artificial selection.(3.4) [1.7]

4. Describes a species in terms of gene flow [1.7]
5. Gives examples of biochemical evolution. [1.7]

VI. 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:

GRADING CRITERIA	POINTS	PERCENTAGE OF FINAL GRADE
Exams (3-4 @ 100pts ea)	300-400	70%
Quizzes 10 points each	100	10%
Lab Exercises 10 points each	100	20%
*TOTAL	*500-600	100%

***The instructor reserves the right to modify the grading criteria as deemed necessary. Students will be notified of any such changes.**

GRADE EQUIVALENCIES:

90-100% = A
 80-89% = B
 70-79% = C
 60-69% = D
 59% and below = F

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 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 of 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/fsuretenion/smarthinkingflyer.pdf>

VIII. COURSE OUTLINE SCHEDULE:

LABORATORY SCHEDULE

WEEK	DATES	LAB SCHEDULE*
1	AUG 15 - 19	NO LAB
2	AUG 22 - 26	NO LAB
3	AUG 29 - SEP 2	Process of Science
4	SEP 5 - 9	NO LAB/HOLIDAY
5	SEP 12 - 16	Measurements in Biology
6	SEP 19 - 23	Biologically Important Molecules
7	SEP 26 - 30	Microscope
8	OCT 3 - 7	Cell Structure & Function
9	OCT 10 - 14	Spectrophotometry
10	OCT 17 - 21	NO LAB/ FALL BREAK
11	OCT 24 - 28	Diffusion/Osmosis
12	OCT 31 - NOV 4	Cellular Membranes
13	NOV 7 - 11	NO LAB/HOLIDAY
14	NOV 14 - 18	Enzymes
15	NOV 21- 25	NO LAB/HOLIDAY
16	NOV 28 - DEC 2	LAB WRAP/LAST WEEK OF CLASS
17	DEC 5 - 9	FINAL EXAMS

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.

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| 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.