

FAYETTEVILLE STATE UNIVERSITY

College of Arts and Sciences Department of Natural Sciences NSCI 120 Modern Biology Fall 2010

I. LOCATOR INFORMATION:

Instructor: Dr. Lorinda McGildery
Course # and Name: NSCI 120 Modern Biology
Semester Credit Hours: 4
Day and Time Class Meets:
NSCI 120-03: Lecture TR 11:00am-12:15pm, LSA 129; Lab F 10:00am-11:50pm, LS 113
NSCI 120-06: Lecture MWF 1:00-1:50pm, LS 113; Lab M 8:00am-9:50am, LS 116
Office Hours: M @ 10am-1pm; T @ 12:20pm-12:50pm; W @ 10am-1pm; R @ 12:20pm-12:50pm
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672-1691 (Departmental Office)

FSU Policy on Electronic Mail: Fayetteville State University provides to each student, free of charge, an electronic mail account (username@broncos.uncfsu.edu) that is easily accessible via the Internet. The university has established FSU email as the primary mode of correspondence between university officials and enrolled students. Inquiries and requests from students pertaining to academic records, grades, bills, financial aid, and other matters of a confidential nature must be submitted via FSU email. Inquiries or requests from personal email accounts are not assured a response. The university maintains open-use computer laboratories throughout the campus that can be used to access electronic mail. Rules and regulations governing the use of FSU email may be found at <http://www.uncfsu.edu/PDFs/EmailPolicyFinal.pdf>

II. COURSE DESCRIPTION:

NSCI 120 (4-3-2) Modern Biology. An introductory course covering basic biological concepts that provides the student with a comprehensive survey of biological sciences. Some important areas which will be investigated are: cell structure and reproduction, energy relationships at the cellular level, genetics, DNA, evolution, ecology, bacteria, protists, fungi, plants, and animal organ systems. Prerequisite: NSCI 110

III. DISABLED STUDENT SERVICES:

In accordance with Section 504 of the 1973 Rehabilitation Act and 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:

Audesirk, Audesirk, and Byers. Life on Earth. With Physiology 9th ed. Custom edition for Fayetteville State University. Prentice Hall, Upper Saddle River, New Jersey. 2003.
Symbiosis Laboratory Manual: Modern Biology, Natural Science 120

THE CONCEPTUAL FRAMEWORK OF THE SCHOOL OF EDUCATION

The conceptual framework defines the vision of the Department of Biological Sciences which underscores the purpose of the School of Education in preparing its candidates for teaching and leadership roles in a global society. The unit prepares candidates who support student learning within the context of family and community participation for a diverse, technological, and global society. We achieve this vision through teaching, research, and service. Our conceptual framework serves as a lens through which we view our education professionals in the secondary education program. The themes of our conceptual framework include knowledgeable and reflective education professionals; working with families and communities; respect for diversity and individual worth; technological competence and educational applications; and caring dispositions and ethical responsibility.

V. STUDENT LEARNING OUTCOMES:

UPON COMPLETION OF THIS COURSE, STUDENTS WILL BE ABLE TO:

Demonstrate ability to interpret information and use the scientific method in problem solving situations

1. Demonstrate an understanding of the way the science of biology is divided into various divisions.
2. Apply the scientific method to appropriate problem situations by the use of observation and experiment.
3. Arrange the major groups of organisms into distinct categories based on their general characteristics.

Demonstrate understanding of the different kinds of cells, organization and functions.

1. Contrast the theory of spontaneous generation with the cell theory.
2. Relate the surface area to volume ratio of cells to their ability to carry on the life processes.
3. Analyze information about the different types of cells and determines their common characteristics.
4. Illustrate the ways in which the prokaryotic cell differs from the eukaryotic cell.

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

1. Use the Kinetic Molecular Theory to explain active and passive transport through cell membranes.
2. Evaluate the effect of osmosis on different kinds of cells and tissues.
3. Assess the effect of concentration gradients on the movement of water and ions in living systems.

Show the involvement of energy and the laws of energy in life processes.

1. Illustrate the ways energy is transferred from one organic system to another.
2. Evaluate the relationship between bond energy and stored chemical potential energy in organic compounds.
3. Assess the effect of various environmental factors such as temperature, pH and water on the action of enzymes.
4. Compare and contrasts the process of photosynthesis with cellular respiration.

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

1. Contrast the process of mitosis with meiosis in complex cells.
2. Assess the effect of sexual and asexual reproduction on populations of organisms.
3. Use the laws of genetics to solve genetic problems involving monohybrid and dihybrid crosses.
4. Demonstrate an understanding of coded genetic information in and transcribed from DNA.
5. Illustrate the process of protein synthesis in a cell containing DNA, RNA and cellular energy.

Demonstrate an understanding of biological evolution.

1. Describe the factors that can cause a change in the genetic makeup of a population.
2. Explain the process of natural selection.
3. Explain how species can be formed.

Demonstrate knowledge of each of the five kingdoms of life.

1. Know the main characteristics that distinguish viruses from bacteria and bacteria from Protista.
2. Understand the harmful and beneficial effects of microorganisms.
3. Contrast the body plan of a fungus with its ecology.
4. Compare vascular, nonvascular, seed and non seed plants.
5. Know the characteristics of the major animal phyla.

Understand the functions of organ systems in the animal kingdom.

1. Identify the components of blood and traces its flow through the human circulatory system.
2. Explain how the body fights disease.
3. Identify the organs in the human digestive system and explains their functions.
4. Understand the action of a respiratory system, by identifying its parts and indicating functions.
5. Understand the role of the liver and kidneys in maintaining homeostasis.
6. Sketch a neuron and identifies its cell body, axon, & dendrites.
7. Describe how a nervous impulse is transmitted.
8. Lists the major parts of the vertebrate brain and indicates an important function of each.
9. Understand the effect of various drugs, including alcohol and nicotine on human behavior and the human nervous system.
10. Describe how a muscle contracts
11. Name the main endocrine glands, indicate where each is located in the human body, and give their functions.
12. Identify the parts of the female and male reproductive systems and explains how they function.

Understand basic concepts of ecology.

1. Understand how density of populations may be regulated.
2. Illustrate the flow of energy through an ecosystem.
3. Describe the general characteristics of the world's biomes and how nutrient cycles operate in them.
4. Demonstrate understanding of how human activities affect the biosphere.

Demonstrate understanding of vascular plant structure and growth.

1. Identify the major tissues and hormones found in vascular plants and how they relate to structure and growth
2. Contrast herbaceous stem development with woody stem development in higher plants.
3. Shows how flowering plants reproduce.
4. Arrange the reproductive parts of a flower in correct order.

VI. COURSE REQUIREMENTS & EVALUATION CRITERIA/GRADING SCALE:

Students are required to take all exams on the date they are scheduled. (Your instructor may assign a date for an exam other than what is listed in the course outline.) Make-up exams will not be given unless special arrangements have been made with the instructor prior to the exam date. Only in very unusual 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. 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.

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

Modern Biology is a 4 hour class with 1 hr 50 min lab and 150 minutes of lecture per week . Three early departures or 3 occurrences of tardiness or combination of both will result in an absence. If student absences exceed 10% of the total contact hours the instructor reserves the right to deduct at least 10% but not exceed 15% of late submitted work. It is left to the discretion of the instructor to accept late submitted assignments.

ATTENDANCE POLICY

REVISION OF GRADES – STUDENT RESPONSIBILITIES

The following revisions became effective on August 16, 2007.

NEW TYPE OF GRADE: INTERIM GRADES – (New name for “midterm grade,” with additional purposes). Interim grades will be assigned from the first week of the semester until the deadline for class withdrawals. Interim grades are used for informational and warning purposes only; they are not part of your permanent transcript and have no effect on your GPA. Instructors may assign interim grade of F to warn students of poor academic performance or they may assign “X” or “EA” grades. (See below for explanations) After midterm, faculty will assign all students an interim grade of A – F to inform students of their academic status as of midterm.

- **INTERIM GRADE X = NO SHOW** – Assigned to students who are on a class roster, but never attend class. For warning purposes only; NOT a final grade.
STUDENTS: Check interim grades early in the semester. If you have an X grade, either begin attending the class or withdraw* from it. *See warning below about class withdrawals. If you do not take action in response to an X grade, you will receive a final grade of FN. (See “FN” below)
- **INTERIM GRADE EA = EXCESSIVE ABSENCES** - Assigned to students whose class absences exceed 10% of the total contact hours. For warning purposes only, NOT a final grade.
STUDENTS: Check your interim grades often. If you have an “EA” grade for a class, you are in jeopardy of failure if you do not take immediate actions. Either resume attending the class or withdraw from it.
**See warning below about class withdrawals.*

NEW FINAL GRADE:

- **FN = FAILURE DUE TO NON-ATTENDANCE** – Assigned to students who are on class roster, but never attend the class. An FN grades is equivalent to an F grade in the calculation of the GPA.
STUDENTS: You must attend (or withdraw* from) all the classes for which you are enrolled. *See warning below about class withdrawals.

WARNING ABOUT CLASS WITHDRAWALS:

- When you withdraw from a class, you are wasting your money and time. You receive no refund for withdrawing from individual classes and you slow your progress toward degree completion.
- If you withdraw from or fail more than one-third of your classes, you will no longer be eligible for financial aid.
- **STRIVE TO EARN CREDIT FOR ALL THE CLASSES IN WHICH YOU ENROLL; WITHDRAW FROM CLASSES ONLY WHEN IT IS ABSOLUTELY NECESSARY!**

Only students officially enrolled in the course can attend lectures and labs. Insurance requirements prohibit friends, relatives and children from attending lectures or labs.

If you must withdraw from the course it is YOUR responsibility to complete the necessary paperwork for the withdrawal. If you stop attending lectures or labs without officially withdrawing from the course, you will receive the grade earned based on your point total (at the time you stop attending) divided by the maximum points (as if you had completed ALL work). This usually means a grade of F will be recorded.

Evaluation will be based primarily on examinations, typed lab reports, a special assignment and quizzes. See section on exams and graded assignments for specifics. Although attendance and punctuality are not normally used in the calculation of your 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.

Exam Questions:

The majority of exam questions will be objective and require mostly recall skills. These will be in the form of multiple choice or fill-in-the-blank (short answer questions). Other questions, including essay, will require higher levels of skill involving the use of interpretation, synthesis, and assessment of information.

Grades will be based on the following percentage scale:

ITEM	%
Mini Tests (6)	40
Final Exam(1)	15
Assignments	10
Quizzes	5
Lab Reports (10)	15
Special Assignment (1) (ie presentation/paper)	15
TOTAL	100

Grades and their Numerical Equivalent are as follows:

Numerical Limit Letter Grades:

92-100%	A	73-82%	C
83-91%	B	64-72%	D
		Below 64%	F

Excessive absent 'FN'

Both 'F' and 'FN' count as zero in computing GPA

Additional Student Responsibilities:

ALL CELL PHONES MUST BE TURNED OFF (no vibration, alerts tones) before entering classroom. Students using cell phones during an exam will be dismissed from class and receive zero for that exam

FSU Policy on Disruptive Behavior in the Classroom

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: Tutorial sessions with NSCI 120 Supplemental Instructor will be available at least once a week. Most students who attend SI sessions regularly tend to receive higher than average final grades for this course. Students who are earning less than a "C" average will be encouraged to attend tutorial sessions. Since NSCI 120 is traditionally a class reserved for non-natural sciences majors, the University College Learning Center may provide additional assistance.

VIII. COURSE OUTLINE

WEEK	DATE/DAY	LECTURE TOPIC	READINGS/CHAPTER
1	Aug. 23/Mon.	#1 INTRO/Scientific Method & Science	Introduction to Life on Earth/1
2	Aug. 30/Mon	#2 Atoms, Elements, Molecules, Water, & Rxns #3 Carbohydrates, Lipids Proteins, Nucleic Acids LAB 1	Atoms, Molecules and Life/2 Biological Molecules/3
3	Sept.6/Mon	#3 Carbohydrates, Lipids Proteins, Nucleic Acids Mini Test 1 on lessons 1&2 #4 Animal Cells vs. Plant Cells LAB 2	Biological Molecules/3 Cell Structure & function/4
4	Sept.13/Mon	#5 Membranes, Energy, and Enzymes #6 Energy, Rxns, & Metabolism LAB 3	Cell Membrane Structure & Function/ Energy Flow in the Life of a Cell /6
5	Sept. 20/Mon	Mini Test 2 on Lessons 3–5 #7 Photosynthesis LAB 4	Capturing Solar Energy: Photosynthesis/7
6	Sept. 27/Mon	#8 Cell Respiration & Fermentation LAB 5	Harvesting Energy: Glycolysis & Cell Res/8
7	Oct. 4/Mon	#8 Cell Respiration & Fermentation Mini Test 3 on Lessons 6-8 #9 DNA Structure & Function LAB 6	Harvesting Energy: Glycolysis & Cell Res/8 DNA: The Molecule of Heredity/9
8	Oct. 11/Mon	#10 Central Dogma LAB 7 Mini Test 4 on Lessons 9&10	Gene Expression & Regulation /10
9.	Oct. 18/Mon	#11 Cell Division, Cell Cycle, Mitosis vs. Meiosis #12 Mendel's Laws, Chromosomes LAB 9	The Continuity of Life/11 Patterns of Inheritance/12
11	Oct. 25/Mon	#13 Special Assignment on Evolution Speciation & Natural Selection Mini Test 5 on Lessons 11&12 LAB 10	Unit 3
12	Nov. 1/Mon	Special Assignment Due #14 Circulation	Animal Anatomy & Physiology/32
13	Nov. 8/Mon	#15 Respiration #16 Nutrition & Digestion	Animal Anatomy & Physiology/33 Animal Anatomy & Physiology/34
14	Nov. 15/Mon	#17 Immunity Mini Test 6 on Lessons 14-17 LAB 11	Animal Anatomy & Physiology/36

Review for Final Exam
LAST DAY OF CLASSES

DEC. 3

**** This is a tentative schedule. The Instructor reserves the right to alter the aforementioned at any time. It is your responsibility to be in class and check the blackboard page for you class at least once a day to keep pace with any changes made to the schedule or assignment

*** NSCI 120 LABORATORY SCHEDULE FOR ALL LABS ***

- LAB 1 = PROCESS OF SCIENTIFIC INQUIRY
- LAB 2 = TOOLS FOR SCIENTIFIC INQUIRY
- LAB 3 = MACROMOLECULES
- LAB 4 = THE MICROSCOPE
- LAB 5 = CELLULAR RESPIRATION
- LAB 6 = GENETICS
- LAB 7 = EVOLUTION
- LAB 8 = CIRCULATION
- LAB 9 = DIGESTION
- LAB 10 = SENSORY SYSTEM
- LAB 11 = ECOLOGY

* = LABORATORY ACTIVITY TO BE ANNOUNCED

WEEK OF	MON.	TUE.	WED.	THURS.	FRI.
AUG. 23	*	*	*	*	*
AUG. 30	1	1	1	1	1
SEP. 6	*	2	2	2	2
SEP. 13	3	3	3	3	3
SEP. 20	3	4	4	4	4
SEP. 27	4	5	5	5	5
OCT. 4	5	6	6	6	6
OCT. 11	6	7	7	7	7
OCT. 18	7	8	8	8	8
OCT. 25	8	9	9	9	9
NOV. 1	9	10	10	10	10
NOV. 8	10	11	11	11	11
NOV. 15	11	*	*	*	*

VIII. TEACHING STRATEGIES

The principal teaching strategies will be lecture, discussion, and laboratory exercises. Utilizing but not limited to power point presentations, transparencies, small group exercises, and mp3 tutorials.

IX. BIBLIOGRAPHY

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

World Wide Web Site:

Audesirk Companion Web Site: <http://www.prenhall.com/audesirk3>