

**Fayetteville State University**  
**College of Arts and Sciences, Department of Biological Sciences**  
**Biol 110: General Biology I Fall 2011 I.**

I. Locator Information:

Instructor: **Dr. Eid Haddad**  
Office Location: **TBA**  
Course # and Name: **Biol 110 General Biology I**

Semester Credit Hours: **4 credit hours**  
Day and Time Class Meets: **Section 03**  
Lecture: **TR 9:30 AM – 10:45 AM LS 109**  
Lab: **T 11:00 AM – 12:50 PM LS 114**

Total Contact Hours for Class: **6 hours per week**  
Office Phone: email  
Email address: [ehaddad@uncfsu.edu](mailto:ehaddad@uncfsu.edu)  
Office hours: **By appointment**

**FSU Policy on Electronic Mail:** Fayetteville State University provides to each student, free of charge, an electronic mail account ([username@uncfsu.edu](mailto:username@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 BIOL 110 (4-3-2) General Biology I:**

An introductory study of concepts relating to the origin of organisms: cell history, reproduction, structure and function; atomic and molecular structure of the cell; energy relations; structure, composition and systematics of major organic compounds; sexual and asexual reproduction; and genetics and evolution. Includes two (2) hours of lab consisting of qualitative experiments illustrating biological principles and basic laboratory techniques.

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. Studies suggest that collaborative learning improves productivity, problem-solving skills, and positive social relationships. Therefore, this course will include some lecturing and several active student-centered component of problem-based learning. **IV. TEXTBOOK AND LABORATORY MANUAL** Campbell, Reece, and Mitchell. 2011. Biology: Concepts and Connections, 7th ed. Addison Wesley Longman, Inc. Symbiosis: The Benjamin Cummings Custom Laboratory Program for Biology 110 Pearson Custom Publishing. 2002.

IV. **STUDENT LEARNING OUTCOMES:**

Upon completion of this course, students will be able to:

1. Apply the scientific method to analyze a biological problem by stating a question/hypothesis, determining & performing appropriate tests, collecting/analyzing/ interpreting data, and proposing new questions about a topic via class discussions, laboratory exercises, a problem centered assignment and on quizzes/examinations.
2. Compare and contrast the characteristics of the five kingdoms based on general characteristics, metabolism, and genetics via class discussions, laboratory exercises, and on quizzes/examinations.
3. Identify and explain the different types of cells based on their origin, organization, and function via class discussions, laboratory exercises, problem based assignments and on quizzes/examinations.

4. Analyze the properties of water and laws of energy that occur in life processes via class discussions, laboratory exercises, a problem based assignments and/or on quizzes/examinations.
5. Compare and contrast the process of photosynthesis with cellular respiration via class discussions, laboratory exercises, problem based assignments and/or on quizzes/examinations.
6. Apply theories of heredity and the laws of genetics to illustrate how genetic information is stored and transferred from one living organism to another via class discussions, laboratory exercises, genetic crosses, problem based assignments and/or on quizzes/examinations.

**Course objectives:**

**Chapter 1. Biology: Exploring Life**

1. Diagram the hierarchy of structural levels in biological organization.
2. Define the properties of life.
3. Describe the two major dynamic processes of any ecosystem.
4. Distinguish between prokaryotic and eukaryotic cells.
5. Describe the basic structure and function of DNA.
6. Distinguish among the three domains of life.
7. Describe the observations that led Charles Darwin to his theory of evolution by natural selection.
8. Distinguish between discovery science and hypothesis-based science.
9. Distinguish between quantitative and qualitative data.
10. Distinguish between inductive and deductive reasoning.

**Chapter 2. The Chemical Basis of Life,**

1. Define matter, an element, and a trace element.
2. Describe the structure of an atom.
3. Define the atomic number and mass number of an atom.
4. Define an isotope and explain what makes some isotopes radioactive.
5. Describe the dangers and uses of radioactive isotopes.
6. Distinguish between ionic bonds, nonpolar covalent bonds, polar covalent bonds, and hydrogen bonds, noting their relative strengths and how and where they form. 3
7. Define and distinguish between heat and temperature.
8. Define a solute, a solvent, and a solution.
9. Explain the basis of the pH scale.
10. Explain how buffers function.
11. Describe the causes and consequences of acid precipitation and ocean acidification.

**Chapter 3. The Molecules of Cells**

1. Define organic compounds, hydrocarbons, a carbon skeleton, and an isomer.
2. Describe the properties of and distinguish between the six chemical groups important in the chemistry of life.
3. List the four main classes of macromolecules, explain the relationship between monomers and polymers, and compare the processes of dehydration synthesis and hydrolysis.
4. Describe the structures, functions, properties, and types of carbohydrate molecules common in the human diet.
5. Describe the structures, functions, properties, and types of lipid molecules.
6. Describe the health risks associated with the use of anabolic steroids.
7. Describe the structures, functions, properties, and types of proteins.
8. Describe the major achievements of Linus Pauling.
9. Compare the structures and functions of DNA and RNA.

**Chapter 4. A Tour of the Cell**

1. Compare the designs of and images produced by a light microscope, a scanning electron microscope, and a transmission electron microscope.
2. Define cell theory and briefly describe the discoveries that led to its development.
3. Distinguish between the structures of prokaryotic and eukaryotic cells.
4. Explain why compartmentalization is important in eukaryotic cells.
5. Compare the structures of plant and animal cells. Note the function of each cell part.
6. Describe the structures and functions of the four compartments of eukaryotic cells.
7. Describe the hydrophobic and hydrophilic components of a plasma membrane.

8. Describe the structure and functions of the nucleus, endomembrane system, smooth and rough endoplasmic reticulum, Golgi apparatus, lysosomes, and vacuoles.
9. Compare the structures and functions of chloroplasts and mitochondria.
10. Compare the structures and functions of microfilaments, intermediate filaments, and microtubules.
11. Relate the structure of cilia and flagella to their functions.
12. Relate the structure of the extracellular matrix to its functions.
13. Compare the structures and functions of tight junctions, anchoring junctions, and gap junctions.
14. Relate the structure of plant cell walls to its functions.

### **Chapter 5. The Working Cell**

1. Describe the fluid mosaic structure of cell membranes.
2. Describe the diverse functions of membrane proteins.
3. Define diffusion and describe the process of passive transport.
4. Explain how osmosis can be defined as the diffusion of water across a membrane.
5. Distinguish between hypertonic, hypotonic, and isotonic solutions.
6. Explain how animal and plants cells change when placed into hypertonic or hypotonic solutions.
7. Compare the processes of facilitated diffusion and active transport.
8. Distinguish between exocytosis, endocytosis, phagocytosis, pinocytosis, and receptor-mediated endocytosis.
9. Define and compare kinetic energy, potential energy, chemical energy, and heat.
10. Define the first and second laws of thermodynamics.
11. Define and compare endergonic and exergonic reactions.
12. Describe the three main types of cellular work.
13. Explain how ATP functions as an energy shuttle.
14. Explain how enzymes speed up chemical reactions.
15. Explain how competitive and noncompetitive inhibitors alter an enzyme's activity.
16. Describe the process of feedback inhibition

### **Chapter 6. How Cells Harvest Chemical Energy**

1. Compare the processes and locations of cellular respiration and photosynthesis.
2. Describe and compare the processes of breathing and cellular respiration.
3. Provide the overall chemical equation for cellular respiration.
4. Explain how redox reactions are used in cellular respiration.
5. Describe the general roles of dehydrogenase, NAD<sub>+</sub>, and the electron transport chain in cellular respiration. 4
6. List the cellular regions where glycolysis, the citric acid cycle, and oxidative phosphorylation occur. Note whether substrate-level phosphorylation or chemiosmosis occur at each of these sites.
7. Compare the reactants, products, and energy yield of alcohol and lactic acid fermentation.
8. Explain how polysaccharides, fats, and proteins are used as fuel for cellular respiration.

### **Chapter 7. Photosynthesis: Using Light to Make Food**

1. Define autotrophs, producers, and photoautotrophs.
2. Explain how plants produce oxygen.
3. Describe the role of redox reactions in photosynthesis and cellular respiration.
4. Compare the reactants and products of the light reactions and the Calvin cycle.
5. Describe the properties and functions of the different photosynthetic pigments.
6. Explain how the electron transport chain and chemiosmosis generate ATP, NADPH, and oxygen in the light reactions.
7. Describe the reactants and products of the Calvin cycle.
8. Review the overall process of the light reactions and the Calvin cycle, noting the products, reactants, and locations of every major step.

### **Chapter 8. The Cellular Basis of Reproduction and Inheritance, 124**

1. Compare the parent-offspring relationship in asexual and sexual reproduction.
2. Explain why cell division is essential for eukaryotic and prokaryotic life.
3. Compare the structure of prokaryotic and eukaryotic chromosomes.
4. Describe the stages of the cell cycle. Identify when DNA is replicated, chromosomes are sorted, and two new cells are formed.
5. List the phases of mitosis and describe the events characteristic of each phase.
6. Compare cytokinesis in animal and plant cells.
7. Explain how anchorage, cell density, and growth factors control cell division.

8. Explain how cancerous cells are different from healthy cells. Distinguish between benign and malignant tumors and explain the strategies behind some common cancer treatments.
9. Explain how chromosomes are paired. Distinguish between autosomes and sex chromosomes.
10. List the phases of meiosis I and meiosis II and describe the events characteristic of each phase.
11. Describe the similarities and differences between mitosis and meiosis. Explain how the result of meiosis differs from the result of mitosis.
12. Explain how independent orientation of chromosomes at metaphase I, random fertilization, and crossing over during prophase I of meiosis contribute to genetic variation in sexually reproducing organisms.
13. Explain how and why karyotyping is performed.

### **Chapter 9. Patterns of Inheritance**

1. Explain why Mendel's decision to work with peas was a good choice. Define and distinguish between true-breeding organisms, hybrids, the P generation, the F1 generation, and the F2 generation.
2. Define and distinguish between the following pairs of terms: genotype and phenotype; dominant allele and recessive allele; heterozygous and homozygous. Also, define monohybrid cross and a Punnett square.
3. Explain how a testcross is performed to determine the genotype of an organism.
4. Describe the inheritance patterns of incomplete dominance, multiple alleles, codominance, pleiotropy, and polygenic inheritance. Provide an example of each.
5. Explain how linked genes are inherited differently from nonlinked genes.
6. Describe patterns of sex-linked inheritance, noting examples in fruit flies and humans.
7. Explain why sex-linked disorders are expressed much more frequently in men than in women.

### **Chapter 10. Molecular Biology of the Gene**

1. Compare the structures of DNA and RNA. 2 Describe the locations, reactants, and products of transcription and translation.
2. Explain how RNA is produced.
3. Relate the structure of tRNA to its functions in the process of translation.
4. Describe the structure and function of ribosomes.
5. Describe the step-by-step process by which amino acids are added to a growing polypeptide chain.
6. Compare the lytic and lysogenic reproductive cycles of a phage.
7. Describe three processes that contribute to the emergence of viral disease.
8. Explain how the AIDS virus enters a host cell and reproduces.
9. Describe the structure of viroids and prions and explain how they cause disease.

### **Chapter 11. How Genes Are Controlled**

1. Describe and compare the regulatory mechanisms of the *lac* operon, *trp* operon, and operons using activators. 5
2. Explain how DNA is packaged into chromosomes. Explain how packing influences gene expression.
3. Explain how eukaryotic gene expression is controlled. Compare the eukaryotic gene expression mechanisms to those of prokaryotes.
4. Describe the process and significance of alternative DNA splicing.
5. Explain how mRNA breakdown, initiation of translation, protein activation, and protein breakdown regulate gene expression.
6. Explain how DNA microarrays can be used to study gene activity.
7. Explain how a signal transduction pathway triggers a specific response inside a target cell.
8. Describe the experiments that demonstrate that differentiated cells retain all of their genes.
9. Explain how nuclear transplantation can be used to clone animals.
10. Explain how viruses, proto-oncogenes, and tumor-suppressor genes can each contribute to cancer.

### **Chapter 12. DNA Technology and Genomics**

1. Explain how plasmids are used in gene cloning.
2. Explain how a cDNA library is constructed and how it is different from genomic libraries constructed using plasmids or phages.
3. Explain how different organisms are used to mass-produce proteins.
4. Explain how DNA technology has helped to produce insulin, growth hormone, and vaccines.
5. Explain how genetically modified (GM) organisms are transforming agriculture.
6. Explain how PCR is used to amplify DNA sequences.
7. Explain how gel electrophoresis is used to sort DNA and proteins.

8. Explain why it is important to sequence the genomes of humans and other organisms.
9. Compare the fields of genomics and proteomics.
10. Describe the significance of genomics to the study of evolutionary relationships and our understanding of the special characteristics of humans.

**North Carolina Department of Public Instruction Specific Competencies** To obtain secondary science licensure and/or endorsement, the teacher should acquire competencies from the following list which are appropriate for the type of license or endorsement being sought.

### **Biology**

- 1.0 Explain the major concepts and principles of biology including concepts in anatomy, physiology, behavior, evolution, genetics, cell biology, microbiology, diversity, growth, human biology, ecology, and the environment. Teachers should demonstrate competence and understanding in their ability to investigate:
  - 1.1 the cell, including chemical composition, the structure and function of cell parts, the role of cells in growth, reproduction and heredity, and methods for the study of cells.
  - 1.2 the chemical processes of life including respiration, digestion, photosynthesis, protein synthesis, and methods for studying chemical processes.
  - 1.3 the principles of genetics and the chemical basis of heredity.

## **VI. COURSE REQUIREMENTS AND EVALUATION CRITERIA**

- a. **Grading Scale – Final Grades – This policy becomes effective on August 16, 2007** Final grades are calculated on a four-point system and affect a student's grade point average as indicated below. Faculty members will delineate in each class syllabus the methods and evaluative criteria for determining final grades in the class.

<http://catalog.uncfsu.edu/ug/academicregulations/grades.htm>

**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!**

**Please note that the WN grade is no longer in effect. Students must not expect faculty to withdraw them from classes**

<http://catalog.uncfsu.edu/ug/academicregulations/classwithdrawal.htm>

- b. **Attendance Requirements-** Students are expected to attend all class meetings, laboratories, and other instructional sessions for all courses in which they are enrolled. **Students are also expected to arrive to class on time and remain in class for the entire scheduled period.** When students must miss class(es) for unavoidable reasons, i.e., illness, family emergencies, or participation in official university sponsored activities – **they are responsible for informing faculty of the reasons for the absences, in advance if possible, and completing all missed assignments after providing appropriate documentation indicating the reason for the absence and missed assignments.** Faculty members will indicate in their syllabi the conditions for making up missed assignments. During the first half of the semester/term, faculty will assign an interim grade of "EA," Excessive Absences, for students whose class absences exceed 10% of the total contact hours for the class. Students who receive EA interim grades must either withdraw from the class or resume attendance. Students who resume attendance must consult with the instructor about completion of missed assignments. The EA is not a final grade, so students who are assigned an interim grade of EA, but do not withdraw from the class, will receive a final grade based on the evaluation criteria for the class.

<http://catalog.uncfsu.edu/ug/academicregulations/classattendance.htm>.

**BIOL 110 Attendance Requirements:** Attendance and punctuality are **MANADATORY** even though this is a 100 level course. General 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. 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.

- c. **Graded Assignments/ Value of Each Assignment** – Evaluation will be based primarily on examinations, quizzes, problem based assignments, special assignment (oral presentation or paper), and laboratory exercises. A few exam questions will be objective and require recall skills. These will be in the form of multiple choice or fill-in-the-blank (short answer questions). The majority of questions (>90%) will be application based multiple choice and essay requiring higher levels of skill involving the use of interpretation, synthesis, and data analysis (charts, graphs, tables, etc.).

ITEM POINTS	% OF FINAL GRADE
<b>Lecture</b>	
Four lecture exams (including the midterm and final*), 10% apiece.	40%
Lecture quizzes (one/chapter)	10%
Lecture (others)	10%
<b>Lab</b>	
Lab Quizzes (up to 12)	15%
18 labs (Reports and Manual)	10%
Lab final exam*	15%
<b>Total</b>	<b>100%</b>

\* Comprehensive

Instructor has the right to change the weight of each category as he deemed necessary

**Grades will be based on the following percentage scale:**

<b>A</b>	90-100%
<b>B</b>	80-89%
<b>C</b>	70-79%
<b>D</b>	60-69%
<b>F</b>	below 60%

**NOTE: Information related to all graded assignments will be posted on Blackboard and/or announced during class (ex. due dates, assignment worksheet, grading rubric, etc.). Lecture quizzes may be announced or unannounced. If the evaluation criteria must be revised because of extraordinary circumstances, the instructor will distribute a written amendment to the syllabus via Blackboard. Guidelines and grading Rubric for Special Assignment will be provided at a later date.**

**d. Policy on Missed or Late Assignments**

1. Students are required to take all EXAMS and CONDUCT ALL LABS ON THE DATE THEY ARE SCHEDULED. Make-up exams WILL NOT be given unless the student has made special arrangements with the instructor prior to the exam date and presents a written excuse before the second class period following the initial date of a test. Only in very unusual cases will any exceptions to these rules be made. CELL PHONES ARE ABSOLUTELY NOT ALLOWED ON TEST DAYS, IF YOU BRING YOUR PHONE ON A TEST/EXAM DAY YOU WILL GET AN AUTOMATIC ZERO ON THAT TEST/EXAM. NO EXCEPTIONS!!
2. Lab manuals will be collected twice during the semester for grading. If you are absent on the day that the lab was initiated, you will NOT receive a grade for that lab regardless of the reason!! Work handed in or reported LATE WILL NOT be accepted, unless accompanied by a valid written excuse. If you miss an assignment due to an unexcused absence, it WILL NOT be accepted. If a student is absent, then they can make up the assignment if a proper excuse is provided. (This applies to Lecture only!)
3. If you must be absent unavoidably, ask a friend to get your assignment, take notes for you, and pick up any handouts. You are also responsible for demonstrating an understanding of content covered in class on the day of the absence.

4. Students are required to attend all classes regularly and to keep appointments when they are scheduled. An absence, excused or unexcused, does not relieve the student of any course requirement.

#### e. 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

([http://www.unccfsu.edu/policy/policies/academic\\_affairs/Disruptive%20Behavior.Final.pdf](http://www.unccfsu.edu/policy/policies/academic_affairs/Disruptive%20Behavior.Final.pdf))

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 (**Cell phones and pagers are not allowed to be operational during lecture or lab periods**)
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:**
  - a. *Students are expected to arrive to class on time, remain in class until dismissed by the instructor, and refrain from preparing to leave class until it is dismissed.*
  - b. *Students are not permitted to wear headphones or other paraphernalia that may be distracting to the classroom environment. Students are not permitted to tape or record the class lectures or lab reviews.*
  - c. *Students are not permitted to use profanity in the classroom.*
  - d. *Students should not pass notes or carry on private conversations while class is being conducted.*
  - e. *Students are not to wear hats, caps, do-rags, or scarves. This applies to males and females.*
  - f. *Open-toed shoes are not to be worn on lab days. Failure to do so will result in the student being asked to leave the class and return with the proper shoes.*
  - g. *Students are not permitted to have visitors in the lab. Also, children are NOT permitted in lecture, lab or in the instructor’s office. In addition, children are not permitted to be in the hallway while the parent is in lecture or lab.*

**Consequences for Failing to Meet Behavioral Expectations:** The first time a student violates one of these rules, the instructor will warn him or her privately, either after class or before the next class. The second time a student violates the guidelines, the instructor may deduct **as many as twenty-five (25) points from the student’s next exam grade**. If a student **violates the guidelines three times**, the instructor will report the student to the Dean of Students for disciplinary action according to the FSU Code of Student Conduct. 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. **Direct student to cease disruptive behavior.**

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

All Biol 110 students are encouraged to use the library and to do supplemental reading in the biological sciences. The following computer software/websites provide a source of current information in a format appropriate for both the major and non-major biology student. **Computer Software/Internet Web Sites:** Biol 110 Selected Course Material on Blackboard at <https://blackboard.uncfsu.edu/> Smarththinking Online Tutoring: [http://www.smarthinking.com/static/pub\\_common/hours.cfm](http://www.smarthinking.com/static/pub_common/hours.cfm) The Learning Center in the H.T. Chick Building is available to assist students with writing, mathematics, and reading.

### VIII. COURSE OUTLINE *BIOLOGY 110 LECTURE SCHEDULE*

Wk of	Lecture Topic (Campbell Biology: Concepts & Connections) <sup>1</sup>	Lab Topic <sup>2</sup>
Jan 9	Orientation Biology: Exploring Life (Ch. 1)	The Process of Scientific Inquiry
Jan 16	The Chemical Basis of Life (Ch. 2)	The Process of Scientific Inquiry
Jan 23	The Molecules of Cells (Ch. 3)	Tools for Scientific Inquiry
Jan 30	<b>EXAM 1 (Ch. 1-3)</b> A Tour of the Cell (Ch. 4)	Tools for Scientific Inquiry
Feb 6	A Tour of the Cell (Ch. 4)	pH and Buffers
Feb 13	The Working Cell (Ch. 5)	Macromolecules I
Feb 20	How Cells Harvest Chemical Energy (Ch. 6)	Macromolecules II
Feb 27	<b>EXAM 2 (Ch. 4-6)</b> Photosynthesis (Ch. 7)	Using the Microscope
Mar 12	Photosynthesis (Ch. 7) The Cellular Basis of Reproduction & Inheritance (Ch. 8)	Using the Microscope
Mar 19	The Cellular Basis of Reproduction & Inheritance (Ch. 8) Patterns of Inheritance (Ch. 9)	Photosynthesis
Mar 26	Patterns of Inheritance (Ch. 9) Molecular Biology of the Gene (Ch. 10)	Cellular Respiration
Apr 2	Molecular Biology of the Gene (Ch. 10) <b>EXAM 3 (Ch. 7-10)</b>	Cellular Respiration
Apr 9	How Genes are Controlled (Ch. 11)	Genetics
Apr 16	DNA Technology and Genomics (Ch. 12)	Genetics
Apr 23	Final Lab & Lecture Exam: Graduating Seniors (comprehensive) Review (rest of class)	Review (lecture and Lab)
May 1	Final Lab Exam (comprehensive) (rest of class)	
May 3	Final Lecture Exam (comprehensive) (rest of class)	

<sup>1</sup> There will be an online quiz/Ch. at the completion of each chapter (up to 10 quizzes)  
<sup>2</sup> There will be a quiz/lab administered at the beginning of each lab and covers materials from the previous lab (up to 10 quizzes).  
 Unforeseen circumstances may dictate changes/revision to the above calendar. Instructor has the right to modify the above as he deemed necessary.

**IX. TEACHING STRATEGIES** Biology 110 is a lecture-based course designed to present the basic theories biology. Biol 100 also contains a laboratory component that provides hands-on implementation of the theories and concepts covered in lecture. The principal teaching strategies will be lecture, animations, discussion, group activities and laboratory exercises.

**X. BIBLIOGRAPHY** A copy of the required textbook can be obtained at the Circulation Desk in the Chestnut library on campus. You will need your current student ID to borrow the textbook. You will need the name of the textbook for the librarian to find the book. A copy of the interactive study guide CD can be obtained at the Media Center in the Chestnut library on campus. You will need your current student ID to check out the CD. 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. Scienc
5. Science News
6. Nature
7. Natural History
8. Cell