Syllabus – Spring 2022  
BIOLOGY 111-01 (20089): Intro. to Cell and Molecular Biology  
MW 3:25 – 4:40 p.m., 154 RITA  

INSTRUCTOR: Michael Janech, Ph.D.  
Email: janechmg@cofc.edu (please make sure to use your CofC email only) I will try to reply the same day if the email is received before 6 p.m., but I do not regularly check my emails after 6 p.m. or over the weekend. Please don’t email my wife (Kathleen Janech) by mistake!  
Telephone: N/A  
COURSE OFFICE LOCATION: 228 or 226 RITA (Grice Faculty Offices)  
OFFICE HOURS: Immediately after class – M/W 4:45 - 5:30pm. We can also schedule a Zoom.  

Co-requisites  
BIOL 111 Laboratory – you MUST enroll in a lab section in addition to this lecture.  

Required Course Materials  
- Biological Science by Freeman, Quillin, Allison, Black, Podgorski, Taylor, Seventh Edition, (Pearson Publishers), with the newts on the cover. You can buy it (hard cover, looseleaf version or digital), rent it, borrow it, or share it with a classmate, but you should have access to this textbook. Many of the figures from my slide set will be referenced from the book. If you have the Sixth edition, it is nearly identical and will suffice.  

Alternative Material  
Youtube has a number of good biology instructional videos that are presented by professionals and amateurs. Beware, Youtube and other unsupervised secondary sources can contain wrong or misleading information. AKlectures.com and Khan Academy are fairly trustworthy sources. The Amoeba Sisters (search on Youtube or Google) take a fun and refreshing approach to biological concepts. Don’t be afraid to use alternative learning tools but realize that quiz and test questions will come from the lecture material presented in class.  

Course Policies and Requirements  

Accommodations  
Any student in this class who has a documented disability should speak to me as soon as possible (in-person, via email or private Zoom chat) before January 21, as well as contact the Center for Disability Services (CDS/SNAP program), located on the first floor of the Lightsey Center, Suite 104, (843) 953-1431, SNAP@cofc.edu. I am unable to retroactively adjust grades and will not allow retesting if you wait. DO NOT WAIT.  

Class Attendance  
You are expected to attend all lectures of the class. Exams will be based on the lectures and the text. You will do well in this course if you attend lectures.  

Honor Code  
Students are required to adhere to the guidelines outlined by the Honor Board in the Student Handbook (please see http://studentaffairs.cofc.edu/honor-system/studenthandbook/9-the-honor-code.php). This includes lying, which will not be tolerated in this course. All work that you turn in for this course (whether for assignments, quizzes, or exams) must be your own independent scholarship. Students should be aware that unauthorized collaboration—working together without permission—is a form of cheating; this includes
collaborating with classmates or other individuals on online quizzes or exams. Other forms of cheating include possessing or using an unauthorized study aid (which could include accessing information via a cell phone or computer), copying from others’ exams, fabricating data, and giving unauthorized assistance. Any form of plagiarism (intentional and unintentional), cheating, or presenting someone else’s work as one’s own will be treated as a serious academic transgression and will be communicated accordingly by the instructor as an honor code violation to Student Affairs. Cheating, attempted cheating, or plagiarism will result in a grade of zero on that assignment or exam and may result in a final overall grade of F or XXF (failure due to academic dishonesty) for the course. All instances of suspected cheating will be immediately communicated to the honor board.

**Grades**

Grades will be determined based on weekly online quizzes, deportment and two exams.

**Quizzes (40% of your grade)**
Weekly short quizzes will be given throughout the semester. They are intended to encourage students to keep up with the large amount of information in this course by studying/reading/reviewing every day. **It is the student’s responsibility to keep up with quiz due dates and times! No make-up quizzes are given, but don’t worry, your lowest quiz score will be dropped in the final grade calculation.** A missed quiz will result in a 0 for that quiz, unless the student provides a valid excuse which include serious illness, personal tragedy or extreme circumstances beyond the student’s control. **If you have a quiz excused, all of your remaining quiz scores will count toward your final grade (none will be dropped).** No more than 2 quizzes may be excused. All cell phones, pagers, iPods, iPads, tablets, laptops, etc. are to be turned off and put away during each quiz, and you are expected to take them by yourself without input from other people, notes, websites or books.

**Exams (50% of your grade)**
In this course, 2 exams are scheduled during the semester (see calendar below for dates): Midterm and Final. The Final exam for this course is Sunday May 1, 2022 3:30-5:30pm.

**There will be no make-up exams.** Anyone who misses an exam will receive a 0, unless the student provides a valid excuse. Acceptable excuses include serious illness, personal tragedy or extreme circumstances beyond the student’s control. If you have any conflicts with the scheduled exams, you must email me one week prior to the exam date. After receiving one excused exam, a student will be in danger of receiving a grade of Incomplete for the course if the final exam is missed. **Translation: You cannot miss both exams and expect to receive a grade for the course.**

All cell phones, pagers, iPods, iPads, tablets, laptops, etc. are to be turned off and stored in a bag or pocket during each exam. The use of any wireless communication device during a quiz, test, or final exam is a violation of the Honor Code. The professor has the right to remove a student’s exam and ask them to leave if this policy is not followed, and they will receive a 0.

**Deportment (10% of your grade)**
Deportment is simply another term for behavior and manners. The reason for grading this category stems from the very minor group of students who feel it is acceptable to disrupt other students and faculty. You are expected to be respectful of your instructor and other students. Everyone who is in class has paid to take the course and most are working towards a productive career. Obscene or disruptive behavior and/or improper email communication will not be tolerated. Inability to properly wear your mask over your nose will not be tolerated. Removing your mask in class will not be tolerated. Grading of deportment is...
completely subjective and non-negotiable. I expect 99.9% of students will receive full credit for this category. Questions and discussion pertaining to the subject matter is **highly encouraged**. Participation in polls is also highly encouraged.

**Grading**
The quizzes will count for a total of 40% of your final grade. Deportment will count for 10% of your grade. The midterm and final exams will count for a total of 50% of your final grade.

Grade calculation formula. 
\[((\text{Quiz avg.} \times 0.40) + (\text{Deportment} \times 0.10) + (\text{Exam avg.} \times 0.50)) \times 100 = \text{final percentage}\]

Letter grades will be determined by the following breakdown:
- $\geq$93% = A
- 90-92 = A-
- 87-89 = B+
- 83-86 = B
- 80-82 = B-
- 77-79 = C+
- 73-76 = C
- 70-72 = C-
- 67-69 = D+
- 63-66 = D
- 60-62 = D-
- $\leq$59 = F

Grades will be populated on OAKS, but feel free to maintain your own record of grades in the case of an error. Any errors should be brought to my attention within a week of the error.

**POLL Everywhere**
“Poll Everywhere” is an interactive online tool that permits the instructor to survey students during lecture. Typically, 3-6 poll everywhere questions will be included per lecture. Responses will be recorded but not graded; HOWEVER, at the end of the course I look at student participation and use participation as a rationale to round-up grades.

**Expectations:**
1. **Proper Deportment:** In this class, you are expected to be respectful of your instructor and other students. Questions and discussion pertaining to the subject matter is highly encouraged. Interactions and exchanges are expected to be professional.
2. **Study and ask Questions.** Although the lectures are recorded, we will have a real-time face-to-face Zoom meeting after every online lecture. Many of you may feel intimidated to ask questions, but you should not. Questions can be about concepts discussed in the online lecture (voice thread) or can span aspects of biology about which you are curious. You have access to a professor who enjoys discussing biology and research and how to navigate career choices. Most people do not. We can chat about many topics, but I will prioritize questions on the lecture.

**COVID:**
Masks must be properly worn in the classroom. If you remove your mask to drink and eat in the classroom, I will ask you to leave the classroom. CofC policy requires masks to be worn at all times. My policy requires masks to be worn at all times. N95 and KN95 masks are the best choices.

If you test positive for Cov-2 virus, please email me immediately upon receiving results so that I can excuse your quiz or help make accommodations. If you are coughing and sneezing and running a fever, please stay home and email me immediately. Do not come to class with a fever. Treat a fever as Cov-2 positive. If you miss a quiz or test due to Covid quarantine, email me immediately. If you wait more than 48 hours after the quiz or exam, I will not excuse the quiz or exam. You get a 0.

If more than 10% of the class is quarantined due to Cov-2 infection, I will move the course to an online format for two weeks. You will use Voice Thread as the media in which to view lectures. We will conduct
Please read this syllabus carefully and keep it for future reference. The information in this and the online syllabus document is important to your success in this course.

We will meet on Zoom at 4:20pm M/W for a Question and Answer session including Poll Everywhere. I will email details to the class prior to moving the course online.

**COURSE CALENDAR**

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>Monday January 10, 2022</td>
<td>Introduction and review of syllabus; Chapter 1</td>
</tr>
<tr>
<td>Wednesday, January 12, 2022</td>
<td>Chapter 2; Atoms and Water</td>
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<tr>
<td>Monday, January 17, 2022</td>
<td>MLK Day no class; Jan 18, Last day of Drop/Add for full semester</td>
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<tr>
<td>Wednesday, January 19, 2022</td>
<td>QUIZ 1: Chapter 2; pH, Acid/Base, Energy, Functional Groups</td>
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<tr>
<td>Monday, January 24, 2022</td>
<td>Chapter 3; Amino Acids &amp; Protein primary structure</td>
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<td>Wednesday, January 26, 2022</td>
<td>QUIZ 2: Chapter 3; Protein structure cont'd and function</td>
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<td>Monday, January 31, 2022</td>
<td>Chapter 4; Nucleic Acids</td>
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<td>Wednesday, February 2, 2022</td>
<td>QUIZ 3: Chapter 5; Carbohydrates - monomers, bonds</td>
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<tr>
<td>Monday, February 7, 2022</td>
<td>Chapter 5; Carbohydrates - polymers, function</td>
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<td>Wednesday, February 9, 2022</td>
<td>QUIZ 4: Chapter 6; Lipids - fatty acids, phospholipids</td>
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<td>Monday, February 14, 2022</td>
<td>Chapter 6; Lipids - membranes &amp; diffusion</td>
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<td>Wednesday, February 16, 2022</td>
<td>QUIZ 5: Chapter 6; Lipids - biological membranes &amp; gradients</td>
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<td>Monday, February 21, 2022</td>
<td>Chapter 7; Cells - Introduction</td>
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<tr>
<td>Wednesday, February 23, 2022</td>
<td>QUIZ 6: Chapter 7; Cells - organelles and cytoskeleton</td>
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<td>Monday, February 28, 2022</td>
<td>No Class – Study for your Mid-Term</td>
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<tr>
<td>Wednesday, March 2, 2022</td>
<td>MIDTERM EXAM Ch1-Ch7, NO LECTURE</td>
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<td>Monday, March 8, 2022</td>
<td>Spring Break No Classes</td>
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<tr>
<td>Wednesday, March 10, 2022</td>
<td>Spring Break No Classes</td>
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<tr>
<td>Monday, March 14, 2022</td>
<td>Chapter 8; Energy Enzymes, Introduction to Metabolism</td>
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<td>Wednesday, March 16, 2022</td>
<td>QUIZ 7: Chapter 9; Cellular Respiration and Glycolysis</td>
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<td>Monday, March 21, 2022</td>
<td>Chapter 9; Citric Acid Cycle, ETC &amp; Oxidative Phosphorylation</td>
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<td>Wednesday, March 23, 2022</td>
<td>QUIZ 8; Chapter 10; Photosynthesis Light Reactions</td>
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<td>Monday, March 28, 2022</td>
<td>Chapter 10; Photosynthesis Calvin cycle, C3/C4 plants</td>
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<td>Wednesday, March 30, 2022</td>
<td>QUIZ 9: Chapter 12; Mitosis - Interphase and DNA replication.</td>
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<td>Monday, April 4, 2022</td>
<td>Chapter 12; Mitosis - S phase, cell cycle control</td>
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<td>Wednesday, April 6, 2022</td>
<td>QUIZ 10: Chapter 13; Meiosis</td>
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<td>Monday, April 11, 2022</td>
<td>Chapter 14; Genetics; Mendel &amp; Principles</td>
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<td>Wednesday, April 13, 2022</td>
<td>QUIZ 11: Chapter 14; Chromosomal Theory of Inheritance</td>
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<tr>
<td>Monday, April 18, 2022</td>
<td>Chapter 16 &amp; 17: Central Dogma - FINAL LECTURE</td>
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<tr>
<td>Wednesday, April 20, 2022</td>
<td>No class - Instructor will be available for Zoom meetings</td>
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<tr>
<td>Monday, April 25, 2022</td>
<td>No class - Instructor will be available for Zoom meetings</td>
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<tr>
<td>Sunday, May 1, 2022</td>
<td>Final Exam, 3:30 – 5:30p, RITA 154</td>
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---Section Below is Required Information to be included in all Syllabi of CofC Bio Courses---

Core Concepts for Bio 111 and Bio 112

This 2-semester course sequence in general biology addresses fundamental principles in biology to prepare students for sophomore and upper level courses in biology:

- **EVOLUTION**: The diversity of life evolved over time by processes of mutation, selection, and genetic change. The theory of evolution by natural selection allows scientists to understand patterns, processes, and relationships that characterize the diversity of life.
- **STRUCTURE AND FUNCTION**: Basic units of structure define the function of all living things. Structural complexity, together with the information it provides, is built upon combinations of subunits that drive increasingly diverse and dynamic physiological responses in living organisms. Fundamental structural units and molecular and cellular processes are conserved through evolution and yield the extraordinary diversity of biological systems seen today.
- **INFORMATION FLOW, EXCHANGE, AND STORAGE**: The growth and behavior of organisms are activated through the expression of genetic information at different levels of biological organization and depend on specific interactions and information transfer.
- **PATHWAYS AND TRANSFORMATIONS OF ENERGY AND MATTER**: Biological systems grow and change by processes based upon chemical transformation pathways and are governed by the laws of thermodynamic and will be explored to understand how living systems operate, how they maintain orderly structure and function, and how physical and chemical processes underlie processes at the cellular level (i.e. metabolic pathways, membrane dynamics), organismal level (i.e. homeostasis) and ecosystem level (i.e. nutrient cycling).

**SYSTEMS**: Living systems are interconnected and interacting and biological phenomena are the result of emergent properties at all levels of organization, from molecules to ecosystems to social systems. The course will explore the dynamic interactions of components at one level of biological organization to the functional properties that emerge at higher organizational levels.

Core Competencies

**Nature of Scientific Knowledge**

- Understand the intellectual standards used by scientists to establish the validity of knowledge, evidence, and decisions about hypothesis & theory acceptance. These standards include: 1) science relies on external and naturalistic observations, and not internal convictions; 2) scientific knowledge is based on the testing of hypotheses and theories, which are under constant scrutiny and subject to revision based on new observations; 3) the validity of scientifically generated knowledge is established by the community of scientists through peer review and open publication of work.
- Understand that new ideas in science are limited by the context in which they are conceived; are often rejected by the scientific establishment; sometimes spring from unexpected findings; and usually grow slowly, through contributions from many investigators.
- Understand that science operates in a world defined by the laws of chemistry and physics.
- Understand the differences and relationships among scientific theories, hypotheses, facts, laws, & opinions.
- Understand the differences between science and technology, but also their interrelations.
- Understand the dynamic (tentative) nature of science.

**Scientific Methods of Discovery**

- Understand the methods scientists use to learn about the natural world (observing; questioning; formulating testable deductive hypotheses; controlled experimentation when possible; observing a wide range of natural occurrences and discerning (inducing) patterns).
- Apply physical/natural principles to analyze and solve problems.

**Develop a Scientific Attitude**

- Develop habits of mind that foster interdisciplinary and integrative thinking (within biology; between biology and other sciences; between science and other disciplines).
- Develop an appreciation for the scientific attitude - a basic curiosity about nature and how it works.
Develop scientific analysis and communication skills
  o Develop quantitative reasoning skills (quantitatively expressing the results of scientific investigations, or patterns in nature and using knowledge of biological concepts to explain quantitatively-expressed data or patterns).
  o Understand the probabilistic nature of science and the use/application of inferential statistics to test hypotheses.
  o Develop scientific information literacy (library, internet, databases etc...); find and evaluate the validity of science-related information.
  o Communicate scientific knowledge, arguments, and ideas in a variety of different contexts (scientific, social, cultural), utilizing a variety of different media (scientific articles, policy statements, editorials, oral presentations etc.).
  o Develop cooperative problem-solving skills (working effectively in teams), but also habits of mind and skills that foster autonomous learning.

Develop an appreciation for the impact of science on society.
  o Develop an appreciation of humans as a part of the biosphere and the impact of biological science on contemporary societal/environmental concerns.
  o Knowledge of the history of the biological sciences and the influences of politics, culture, religion, race, and gender on the scientific endeavor.

Signature assignments for measuring learning outcomes

Learning Outcome 1: Students apply physical/natural principles to analyze and solve problems.

This learning outcome is assessed using the poster (or scientific article) generated in Biology 112 lab as part of the multi-week student-directed independent research project. In this project students use data they collect (or has been collected in actual research investigations) to test an hypothesis of their choosing. These projects may be themed, with all student groups addressing different aspects of a larger question, emphasizing the interdependence of various research groups needed to address complicated problems. This multi-week project begins the class identifying what questions need to be addresses in the larger problem. Individual student groups then become experts in these areas of the larger problem. The smaller research teams develop a hypothesis, and write a research proposal to test their hypothesis. Students collect (or use already collected data), summarize and statistically analyze the data, and draw conclusions.

Learning Outcome #2 - Students demonstrate an understanding of the impact that science has on society.

Biology 112 lab Students produce a written document based on one of the case-based labs (examples - policy statement, article, stake-holder professional letter or poster) that requires them to research and apply biological knowledge or evidence to defend or critique a proposed solution to a biology-related societal issue. Although the choice of the specific issue or proposed solution is course-section specific, some examples of potential issues include

- exploring environmental/health impacts of genetically modified organisms
- the use of performance enhancing drugs in sports
- the development of antibiotic resistance in disease organisms

[1] This learning goal will be measured as part of the general education assessment. The specific learning outcome to be measured is: Students can apply physical/natural principles to analyze and solve problems.

[2] This learning goal will be measured as part of the general education assessment. The specific learning outcome to be measured is: Students can demonstrate an understanding of the impact that science has on society.