

Syllabus part 2 of 2 – Spring 2019

BIOLOGY 102 sec. 03: Concepts and Applications in Biology II (CRN 20105)

TR 10:50 a.m. - 12:05 p.m., RITA 101



INSTRUCTOR:

Mrs. Kathleen E. Janech, M.S.

janechk@cofc.edu

(email is the best way to reach me – please make sure to use your CofC email only!) I do my best to reply the same day if the email is received before 5 p.m., but I do not check my emails after 5 p.m. or over the weekend.

Also, please include your **course number and section number**, and don't email my husband by mistake!

(843) 953-4896 (I do not check voicemail everyday)

OFFICE LOCATION: 65 Coming St., Rm. 214 (I am on the second floor of a little white house, just across Coming St. from the loading dock area of RITA).

OFFICE HOURS (drop-in): T and R from 1:35 - 2:35 p.m. You are welcome to email me to schedule an appt. at another time or location.

Course Description

To provide non-science majors with a general overview of living systems, with emphasis on evolution, organismal diversity, and ecology. The goal of the course is to provide a foundation for students to appreciate, understand and critically evaluate biological issues facing society.

Prerequisites

BIOL 101 and BIOL 101L are prerequisites to BIOL 102. If you have not passed BIOL 101 (or BIOL 111), you should **not** be in this class.

Co-requisites

BIOL 102 Laboratory – you **MUST** enroll in the lab section in addition to this lecture.

Required Course Materials



1. **Textbook:** *Biology: Concepts and Applications*, by Starr, Evers & Starr, Ninth Edition, 2015 (Cengage Publishers). You can buy it, rent it, get the digital version, borrow it, or share it with a classmate, but you **MUST** have access to this textbook! **Keep up with the reading!**
2. **Online:** The Remind app, CofC email, and online access through MyCharleston to OAKS (<http://blogs.cofc.edu/oaks/students/getting-started/>) and Voice Thread

Suggested Course Material

Center for Student Learning – I encourage you to utilize the Center for Student Learning (CSL) and their academic support services for assistance with study strategies and course content. They offer tutoring, Study Skills appointments, and workshops that help students of all abilities become more successful throughout their academic career. Services are available to you at no additional cost. For more information, please visit the CSL website at <http://csl.cofc.edu>, or call (843) 953-5635, or drop by their location on the first floor of the Addlestone Library.

Teaching Philosophy

I encourage participation and interaction in my lectures and will do my best to create a fantastic learning environment. However, it is not all up to me. I depend on you, the student, to also take an active role in your education (after all, you pay to be here!) by challenging me with questions and participating.

How to Take This Course

(with credit & thanks to, and in memory of, Dr. Conseula Francis)

Any course, in any given semester, is a journey, often to a place you haven't been before. You may be super excited about the trip, eager to get going and explore the sites. Or maybe you are here because you were told to take this course. Or maybe you are somewhere in-between. Imagine, if you will, that we're all standing at the base of a mountain. We all have to decide how we're going to climb it, and you alone can decide the manner of your exploration.

<p><u>Day Hiker</u> You're sticking to the trail because you're certain of where it goes. You want the basics - lists, order of processes, details to memorize. There is nothing wrong with this approach, especially if the material is new to you. A successful day hiker will take notes during class, read all related pages in the book</p>	<p><u>Backpacker</u> You're ready to spend a few days on this mountain and you have supplies (already existing knowledge, interest, inclination) to help you. You have a grasp of the basics, and are ready to explore beyond them. Backpackers will hone their note-taking skills in class, read all related pages in the</p>	<p><u>Trailblazer</u> You are blazing your own way, finding new routes up the mountain and new connections between all aspects of the material, things others may not see. You are passionate about, and interested in, not only the <i>what</i> and the <i>why</i>, but also the <i>how does this connect to other things in the bigger</i></p>
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<p>after class, and review their notes at least twice a week. A day hiker may do well on quizzes, but they will have to dig a little deeper for exams to really understand the connections between all aspects of the material.</p>	<p>book both before and after class so they can ask questions about anything that is not clear, and really spend time digesting all of the information that is contained in the figures in the textbook. They might even drop in to the professor's office hours from time to time, or send an email, with a question.</p>	<p><i>picture?</i> Trailblazers often use different colors when taking notes, and read more in the book than is required, because they really want to understand the whole picture. They study the figures and try to draw them on their own for mastery. They ask questions and spend a lot of time with the material. For trailblazers, this course is part of the expedition to discover all that science has to offer.</p>
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No matter which path you choose, remember that all explorers need to do their best to limit outside distractions. Yes, life happens, and can divert us from the path, but by putting all of our devices away and really focusing while we are in class, we are giving our brains the gifts of time and focus.

Course Policies and Requirements

Accommodations

Any student in this class who has a documented disability should speak to me as soon as possible, 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

Class Attendance

You are expected to attend all meetings of the class. Students are responsible for **getting their own notes from a classmate** for any class missed. Exams will be based almost entirely on lectures with the text used for background information and reinforcement. **You will not do well in this course if you miss lectures. This material is challenging and requires work on your part for success!**

Assignments

Two homework assignments will be assigned during the semester. These assignments are intended to reinforce material covered in class and to encourage critical thinking. They will require you to seek information from sources outside of class and in addition to your textbook. Due dates are given below. **Because of the assignments and other REAL opportunities to EARN credit in this course, I do not offer any extra credit projects.** All students are expected to turn in their assignments (which are to be done independently, unless otherwise stated) by the beginning of the class period on the date scheduled, and they will only be accepted **typed and stapled/glued** (otherwise points will be lost). Assignments will lose one full letter grade for every day of delay (**any time after 5 p.m. counts as the next day**). You should hold onto all graded material until the final grade has been turned in.

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. Be especially cautious of plagiarism when using Internet sources. **Cheating, attempted cheating, or plagiarism will result in a grade of zero on that assignment, quiz or exam and may result in a final overall grade of F or XXF (failure due to academic dishonesty) for the course.**

Quizzes

Several short quizzes will be given throughout the semester on OAKS. They are intended to assist students in keeping up with the large amount of information in this course by encouraging them to prepare and study/read/review **EVERY** day. **It is the student's responsibility to keep up with due dates and times! No make-up quizzes are given, but your lowest quiz score will be dropped in the final grade calculation.** A missed quiz will result in a 0 for that quiz, unless you provide a valid and documented absence memo (through the Absence Memo Office – see below). Acceptable excuses include serious illness, personal tragedy or extreme circumstances beyond your 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, Apple watches, 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 other people, notes, books or websites.**

Exams

In this course, there are 4 regular exams scheduled during the semester (see calendar below for dates) and 1 cumulative final exam scheduled during the final examination period. **You will need to bring a #2 pencil with you to exams, as they will be Scantron (please see me ASAP if you are not familiar with this testing procedure!).** **There will be no make-up exams.** Anyone who misses an exam will receive a 0, unless you provide a valid and documented absence memo (through the Absence Memo Office, Lightsey Center, Suite 101 (behind the bookstore), (843) 953-3390, <http://victimservices.cofc.edu/absence-memo/index.php>, absencememo@cofc.edu) for missing a scheduled exam. Acceptable excuses include serious illness, personal tragedy or extreme circumstances beyond your control. If you have any conflicts with the scheduled exams, you must see me ahead of time, **well before the exam date.** After receiving one excused exam, a student will be in danger of receiving a grade of Incomplete for the course if any more exams are missed. **All cell phones, Apple watches, pagers, iPods, iPads, tablets, laptops, etc. are to be turned off and put away completely 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, and possible further disciplinary action.**

Grading

The quizzes will count for a total of 15% of the lecture portion of your final grade. The assignments will count for 10% of the lecture portion of your final grade. The 4 regular exams will count for a total of 60% of the lecture

portion of your final grade. The cumulative final exam will count for 15% of the lecture portion of your final grade. Grade calculation formula (try for yourself in an Excel spreadsheet):

$[(\text{Quiz avg.}) * 0.15] + [(\text{Assign. avg.}) * 0.10] + [(\text{Exam avg.}) * 0.60] + [(\text{Final exam score}) * 0.15]$ = Lecture portion of your final grade (75% is how much this portion counts for your final grade in Bio. 102). The grade that you earn in your Bio. 102 lab will count for the remaining 25% of your final grade for Bio. 102.

Students who have a SOLID “A” average (93 or higher) at the end of the semester FOR THE LECTURE PORTION OF THE COURSE can opt to be exempt from the final exam, BUT you must talk to me to confirm; no show = 0.

Letter grades will be determined by the following breakdown:

≥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- ≤59 = F 0 due to acad. dishonesty = **XXF**

Please teach yourself how to check on your grade in this course on OAKS, and follow along during the semester. Any errors can be brought to my attention, and are much easier to fix the sooner they are detected!

My Expectations of Students in my class:

- 1. Proper Deportment:** In this class, you are expected to be respectful of your teacher and other students. Talking, texting and computer use are prohibited. If you need to do these things, please leave the room until you are finished. I am trying to do my job and others are trying to learn – please be courteous and pay attention! If you have a question, please ask me – I love questions from students!
- 2. Electronic device policy:** In keeping with #1 above, the use of wireless communication devices during class is prohibited, other than to respond to a Cougar Alert announcement - therefore please **SILENCE** all cell phones, pagers, iPods, iPads, tablets, laptops and anything with alarms before coming into my class **AND PUT THEM AWAY**. If you forget to do so you **RISK BEING PERSONALLY REMINDED DURING CLASS** and you may be asked to leave and not to return that class period. ***If you have a legitimate need to use a laptop, please see me to discuss.*** The **only exception to this policy** is that I will allow you to use your phone to make ***audio recordings of my lectures - no video please*** (I have been told that there are several free apps available to use for this). In that case, you may have your phone face down on the desk only.
- 3.** This is a large class, and it will take me some time to learn your names. However, I have an excellent memory and I can see everyone, even in such a large classroom, so please stay awake, participate and be attentive. It is important that you start presenting yourself as a serious, professional student when dealing with faculty and other students in the class. **One day you will be asking for letters of recommendation – start thinking now about what you want those letters to say about you, and act accordingly.**

COURSE CALENDAR

(lecture schedule is tentative – I will notify class of any changes – but exam dates are firm!)

Date	LECTURE TOPIC	Chapter
January		
T 8	Welcome, Intro., & start Evolution, Galapagos Islands, Hardy-Weinberg formula	16.2,17.1-17.2
R 10	Violations of H-W and Evidence for Evolution / <i>Last day to Drop/Add is Monday!</i>	17.2, 17.7, 17.6, 16.2 –16.4, 16.6, 16.9, 17.4, & p. 297
T 15	More Evidence for Evolution	16.1, 16.5, 16.7
R 17	Malthus and Darwin’s observations on Natural Selection; camouflage and mimicry and patterns of Natural Selection	16.8, p. 257 in 16.2, 41.4 17.3-17.6, 17.1
T 22	Misconceptions about Evolution, Cladistics, Taxonomy and Speciation	1.4, 17.12, 17.13, 16.6, 17.8, 17.9, Geologic clock on p.271, 17.10 (part)
R 24	Finish Speciation	17.10 (part), 17.11, 17.12, 17.13
T 29	**EXAM 1**	
R 31	Origins of Life and Prokaryotes (Bacteria and Archaea) / <i>Last day to submit an application for graduation is tomorrow, Seniors!</i>	18, 19.4 (part), 19.5, 19.7, 19.8, 4.12 p. 71, 1.3 p. 8
February		
T 5	Viruses	19.1 and a little of 19.2
R 7	Protists: From Prokaryotes to Eukaryotes	20.2 (part), 20.4 (part), 20.5; p. 283 (chap. 17) on malaria; 20.6 (part), 20.7 (part)
T 12	Plant Evolution – Bryophytes and Ferns / Darwin Week	21.1, 21.2, 21.3, 21.4
R 14	More on Plant Evolution – Gymnosperms and Angiosperms and Plant Tissues / Happy Valentine’s Day! / Darwin Week	21.5, 21.6, 21.7, 25.1 (part), 25.6 (part), 25.7 (part)
T 19	Plant Reproduction and Development, Fungi / Assignment 1 Due	27.1, 27.2, 22.1 (part), 22.2 - 22.4 (parts)
R 21	**EXAM 2**	
T 26	Plant Reproduction and Development, Fungi	27.1, 27.2, 22.1 (part), 22.2 - 22.4 (parts)

R 28	Start Animal Evolution – Traits and Trends	23.1, 23.2, 23.3, 23.4
March		
T 5	More Animal Evolution - Invertebrates	23
R 7	Animals - Invertebrates / Midterm grades available tomorrow	23
T 12	Animals – Vertebrates	24
R 14	Animals - Vertebrates	24
T 19	OFF – HAPPY SPRING BREAK!!!	
R 21	OFF – HAPPY SPRING BREAK!!! / Last day for students to withdraw with a grade of “W” is Monday, March 25th!	
T 26	**EXAM 3**	
R 28	Start Human Evolution	24.8 – 24.12
April		
T 2	Finish Human evol., start and finish Human Population Ecology	24.8 – 24.12, 40.3, 40.6
R 4	Human Systems – start Innate Immunity	34
T 9	Human Systems – more Immunity	34
R 11	Human Systems - Endocrine control and Hormones	31, 38
T 16	**EXAM 4**	
R 18	Last day of this class! Human Repro. & STDs, Assignment 2 Due	31, 38
T 23	Official last day of classes for the spring semester (but ONLY Monday classes will meet on this day)	
	I will open your final exam on Sunday, so study and take your final exam on OAKS before it closes on Tuesday!!!	

Tues. 30	FINAL CUMULATIVE EXAM on OAKS will be DUE by 11 a.m. today! It will close at 11 a.m and not reopen.	
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**** Please note:** as stated in the 2018-2019 Undergraduate Catalog, under Academic Regulations, Final Examinations (<http://catalog.cofc.edu/content.php?catoid=12&navoid=572#final-examinations>):

“Examinations **must** be taken at the time scheduled (<http://registrar.cofc.edu/pdf/exam-schedule-spring2019.pdf>), **except** when:

1. Two or more exams are scheduled *simultaneously*.
2. Legitimate **AND** documentable extenuating circumstances prevent the student from completing the examination at the scheduled time (e.g., burial services for an immediate family member)

Note: Forms for requesting permission to reschedule one exam may be found on the Student Academic Forms channel on the Academic Services tab in MyCharleston. Written permission of the instructor and all relevant signatures must be obtained at least 24 hours prior to the scheduled time for the final examination.”

CONCEPTS AND APPLICATIONS IN BIOLOGY I & II

BIOL 101 & 101L/BIOL 102 & 102L

Department: Biology

Learning Goals & Objectives

This general education science course provides a background for understanding and evaluating contemporary topics in biology and societal/environmental issues. Students develop a general understanding of core concepts and develop the critical competencies that form the bases for the practice of science and use of scientific knowledge.

Core Concepts

This 2-semester course sequence in general biology addresses fundamental principles in biology which broadly include:

- **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 transformation 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).**
- **Biological 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.**

These ideas are explored from the perspective of the following topics in each course:

BIOL 101 & 101L

- **Chemical and Physical Properties of Life**
- **Evolution as a unifying principle in biology**
- **Cell Form & Function**
- **Energetics and Metabolism**
- **The Cell Cycle**
- **Meiosis and Sexual Reproduction**
- **Mitosis and Cell Reproduction**
- **Mendelian Genetics**
- **Patterns of Inherited Traits**
- **Human Inheritance**
- **The Molecular Basis of Inheritance**
- **DNA and protein production**
- **Regulation of gene expression**
- **Biotechnology**

BIOL 102 & 102 L

- **Evolutionary Processes**
- **Origins of Life**
- **Biodiversity**
- **Viruses, Bacteria and Archaeans**
- **"Protist" Lineages**
- **Plants**
- **Fungi**
- **Animals**
- **Plant Form & Function**
- **Animal Form & Function**
- **Principles of Ecology**

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 outcome of the testing of hypotheses and theories that 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 the real world as defined by the laws of chemistry and physics.**
- **Understand the differences between and relations among a scientific theory, hypothesis, fact, law, & opinion.**
- **Understand the differences between science and technology but also their interrelations.**
- **Understand the dynamic (tentative) nature of science.**
- **Scientific Methods of Discovery**
 - **[1]Understand the methods scientists use to understand 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.**
- **Developing 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.**
- **Developing scientific analysis and communication skills**
 - **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).**
 - **Understand the probabilistic nature of science and the use/application of inferential statistics to test hypotheses.**
 - **Develop scientific information literacy (library, internet, databases etc...); finding and evaluating the validity of science-related information.**
 - **Communicate scientific knowledge, arguments, ideas in a variety of different contexts (scientific, social, cultural) and utilizing a variety of different media (scientific articles, policy statements, editorials, oral presentations etc...).**
 - **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.**

- Develop an appreciation of humans as a part of the biosphere and the [2]impact of biological science on contemporary societal/environmental concerns.
- 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 102 lab as part of the multi-week student-directed independent research project. In this project students use ecological data they collect (or which has been collected in actual research investigations) to test an ecological hypothesis of their choosing. This multi-week project begins with students becoming experts in various areas of ecological sampling. Students, working in small research teams, decide on a question they would like to explore. Teams then develop a research proposal to test their hypothesis. Students collect (or use already collected data), summarize and analyze the data, and draw conclusions.

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

BIOL 102 lab students produce a written document (examples - policy statement, article, stake-holder professional letter or poster) which 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 epidemic of diabetes in the United States
- solutions for mitigating global climate change

Textbook: The text book (Biology: Concepts and Applications (currently - 9th Ed.) by Starr, Evers & Starr.

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

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