

BIO 110:010 Principles of Biology

Fall 2018

Faculty: Ginger R. Fisher, Ph.D.
Office Location: Ross Hall 1526
Office Hours: Tues 8:00-10:00, Wed 8:00-9:00

Office Phone: 970-351-2210
Email: Ginger.fisher@unco.edu
Class Time: MWF 10:10-11:00AM

Course Description

Welcome to *a study of life*! This course examines biological principles from cells to communities, especially structure and function. You will explore genetics, metabolism, physiology, and homeostasis. This course will help build a foundation of knowledge about how all living organisms from a simple yeast cell to a gigantic blue whale live and survive. Although this course fulfills one of the general education requirements, it is not recommended for non-science majors.

Course Purpose

Have you ever thought about how all the parts of a cell work together? Did you ever wonder how DNA makes you who you are? Have you ever thought about what scientists *really* do? This course will give you insight not only into the basics of biology but also allow you the opportunity to design your own research project and start the process of becoming a scientist.

LAC

This course satisfies 4 credits of LAC Area 6

Course Objectives

After completing this course students will be able to:

1. Describe and apply the basic principles of the discipline
2. Discuss and demonstrate how scientists solve problems in the discipline
3. Evaluate the validity of scientific arguments
4. Collect, organize and interpret data
5. Demonstrate skills in observation

Text

The textbook for this course is "Biology, 4th edition" by Brooker, Widmaier, Graham and Stiling, which comes with access to homework assignments as part of your purchase. You have two options for how to purchase this. You only need to choose one of these options.

- A. Buy the electronic version of the book and the access code for the Connect homework directly through Canvas at the beginning of the semester. To do this, click on the first homework link in the Canvas site for the BIO 110 course and enter your credit card information there. This is what I would recommend, but I realize that some students want a print copy of the book so we have made that available as well (see below).
- B. Buy the looseleaf version from the UNC bookstore AND the access code for the Connect homework. You will then enter your code on Canvas once the semester begins.

Other Required Materials

1. Lab Manual: The laboratory manual for this course will be provided for you on Canvas. However, you **MUST** print out the entire lab manual and bring it to your first laboratory session. I recommend that you use a service such as Fed-Ex Kinko's or UPS and have it printed for you.
2. Course Response System (a clicker): you will need to purchase an iClicker with 5 yr. mobile access card. These are available at the UNC bookstore.

3. Composition Notebook: this is a blank notebook that you will use as your lab notebook when conducting your experiments. It can be purchased at the UNC bookstore or any office supply store.

Canvas

You can access all course materials via the Canvas learning management system. All students are expected to check this site often, as this is my primary means of communication.

Lecture Conduct

UNC's policies and recommendations for academic misconduct will be followed. During class, talking on the phone, texting, listening to an iPod, talking with fellow students, and doing other work not related to class is not permitted. If you are doing any of these activities, you will be asked to leave the lecture hall immediately. On days when we do case studies, you will not be allowed to use computers during the lecture period. Lectures will start and end on time, so come to class a few minutes early to get settled and ready to begin. If you find you are running late, quietly enter the back of the classroom and slip into a row with minimal commotion. Please treat me and your fellow students with consideration and basic courtesy.

Academic Integrity

As members of a scholarly community dedicated to healthy intellectual development, students and faculty are expected to share the responsibility for maintaining high standards of honesty and integrity in their academic work. All material for this course must be your work and no one else's. Cheating or plagiarism in any form will not be tolerated. This includes, but is not limited to, copying someone else's work, and using banned material while taking exams. The penalty for cheating or plagiarism is a zero for the course. UNC's policies and recommendations for academic misconduct will be followed. For additional information, please see the Student Code of Conduct. *Honor Code: all members of the University of Northern Colorado community are entrusted with the responsibility to uphold and promote five fundamental values: Honesty, Trust, Respect, Fairness, and Responsibility. These core elements foster an atmosphere, inside and outside of the classroom, which serves as a foundation and guides the UNC community's academic, professional, and personal growth. Endorsement of these core elements by students, faculty, staff, administration, and trustees strengthens the integrity and value of our academic climate.*

Disabilities

Disability Resources: It is the policy and practice of the University of Northern Colorado to create inclusive learning environments. If there are aspects of the instruction or design of this course that present barriers to your inclusion or to an accurate assessment of your achievement (e.g. time-limited exams, inaccessible web content, use of videos without captions), please communicate this with your professor and contact Disability Support Services (DSS) to request accommodations. Office: (970) 351-2289, Michener Library L-80. Students can learn more about the accommodation process at <http://www.unco.edu/disability-support-services/>

Evaluation

Exams 1-3	35%	(lowest grade will be dropped)
Final Exam	25%	
Laboratory	25%	
Weekly Homework	15%	

Grade Breakdown

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

Exams

Each of the first three exams will cover approximately 1/4 of the course material presented in lecture and in the textbook. The final exam will include both the last 1/4 of the material presented as well a comprehensive review of all material covered throughout the semester. Essentially, the final exam covers the entire semester. The format for all exams will be multiple choice and the lowest grade of the first three exams will be dropped. You are required to bring a #2 pencil, an eraser, and picture I.D. to class on exam days. You will NOT be allowed to listen to your iPod or other portable device, so do not bring them to class. **The date for the final exam is Tuesday, December 4th from 8:00-10:30AM.** Do not plan to leave campus before the final exam date, as no early finals will be given. Attendance is mandatory for all exams and the exam dates are not negotiable. If you miss an exam without prior notification and approval, you will receive a zero for the exam. Because the lowest exam grade of the first three exams is dropped, there are NO MAKE-UP EXAMS. It is therefore in your best interest to take all exams in case you experience an emergency and need to miss one later in the semester.

Homework

At the beginning of each new chapter that we cover in class, a homework assignment will be provided on Canvas. You need to complete and submit this assignment BEFORE you come to class on the day we begin that new chapter. If you take it too late or if you forget to do the assignment, it will not be reopened for you and there are no make-up homework assignments. To access the homework, click on the link for the homework assignment in Canvas. This will take you to a site to register and add your email address. You must use your UNC email!! You will then be asked to provide the code that you purchased in the bookstore. If you have not yet purchased a code, you may do so at this time. You will then gain access to the homework assignment. Answer the practice questions provided until you have reached 100% completion. If you have technical issues with the homework assignment, please call the McGraw Hill technical support at 1-800-331-5094. They will work with you and provide you with a case number. In order for me to reopen an assignment, I must first have the case number which indicates that there was a technical issue.

Clickers

Each student is required to purchase a clicker for this course. These will be used to answer questions during class, as well as during the case studies. There will be a set number of clicker questions throughout the semester, and you will be given up to 5 extra credit points on the final exam based on the total number of questions you ask. For example, if you answer 100% of the questions, you will get 5 points. If you answer 80% of the questions, you will get 4 points (which is 80% of the 5 possible points). Once you purchase your clicker, you will need to register it for the course. To do this, go to the Canvas site for the course and click on the Assignments Button and then choose "Register Your Clicker". Follow the directions for registration. All clickers must be registered by the end of the second week of classes to be eligible for the extra credit points. You will not be able to use the iClicker software app for your phone due to the limited wifi and cellular capacity in the classroom. Please note that answering for another student or bringing their clicker to class so that they will get credit is considered cheating and will result in both students earning a zero for the entire course.

Laboratory

This course has a required laboratory portion associated with it. The laboratory session meets all weeks except the week of August 21st, September 4th and November 20th (Thanksgiving break). You will be given a separate syllabus for the lab, and will be expected to follow all guidelines listed therein. There is not a separate grade reported for lab, instead the laboratory grade is entered as a portion of the lecture grade.

Course Schedule

Wk	Day	Date	Lecture Topic	Chpt	HW due	Lab Topic
		THEME 1	INTRODUCTION AND MOLECULES			
1	M	20-Aug	Introduction - what is life?			Scientific Method
	W	22-Aug	Studying Life	1		
	F	24-Aug	Case Study Science Methods		chpt 1	
2	M	27-Aug	Chemistry of Life	2	chpt 2	Lit Review and Critique
	W	29-Aug	Small Molecules			
	F	31-Aug	Case Study - Too Much Aspirin			
3	M	3-Sep	LABOR DAY: NO CLASS			NO LABS THIS WEEK
	W	5-Sep	Carbohydrates and Lipids	3	chpt 3	
	F	7-Sep	Proteins and Nucleic Acids			
4	M	10-Sep	Case Study - Brains and Broncos			Using the Microscope
	W	12-Sep	Chemical Evolution	22	chpt 22	
	F	14-Sep	EXAM 1			
		THEME 2	CELLS AND ENERGY			
5	M	17-Sep	Cells - types and principles	4	chpt 4	Dilutions and Standard Curve
	W	19-Sep	Cells - organelles			
	F	21-Sep	Cell Structure and Disease			
6	M	24-Sep	Case Study- Infection Diagnosis			Algae
	W	26-Sep	Membranes Structure and Chemistry	5	chpt 5	
	F	28-Sep	Membrane Synthesis and Transport			
7	M	1-Oct	Case Study- Ecstasy			Graphing and Data Analysis
	W	3-Oct	Thermodynamics and Enzymes	6	chpt 6	
	F	5-Oct	Enzyme Control and Pathways			
8	M	8-Oct	Case Study - Fire and Fish			Research Projects
	W	10-Oct	Review - Exam Prep			
	F	12-Oct	EXAM 2			
		THEME 3	CELL PROCESSES			
9	M	15-Oct	Cellular Respiration	7	chpt 7	Research Projects
	W	17-Oct	Case Study - Metabolic Murder			
	F	19-Oct	Anaerobic Respiration and Fermentation			
10	M	22-Oct	Case Study - Fun in Fermentation			Research Projects
	W	24-Oct	Photosynthesis I	8	chpt 8	
	F	26-Oct	Case Study - Photosynthesis			
11	M	29-Oct	Cell Communication	9	chpt 9	Research Projects
	W	31-Oct	Case Study - THC and Memory			
	F	2-Nov	Nucleic Acid Structure	11	chpt 11	
12	M	5-Nov	DNA Replication			Research Projects
	W	7-Nov	Case Study - Dracula			
	F	9-Nov	EXAM 3			
		THEME 4	GENETICS			
13	M	12-Nov	Transcription	12	chpt 12	Research Projects
	W	14-Nov	Translation			
	F	16-Nov	Gene Regulation	13	chpt 13	
14	M	19-Nov	Case Study - Schizophrenia			NO LABS THIS WEEK
	W	21-Nov	THANKSGIVING: NO CLASS			
	F	23-Nov	THANKSGIVING: NO CLASS			
15	M	26-Nov	Mitosis and Meiosis	14,15	chpt 14	Presentations
	W	28-Nov	Simple Mendelian Inheritance	16	chpt 16	
	F	30-Nov	Other forms of inheritance and pedigrees	17		
16	T	7-Dec	FINAL EXAM 8:00-10:30AM This is a TUESDAY			

LAC6 Student Learning Outcomes:

1. Explain the fundamental concepts within the scientific field of study at the introductory level.
2. Explain relevance of the science content to real world topics affecting humanity.
3. Evaluate the quality of evidence in a scientific argument
4. Select or Develop a Design Process. a. Select or develop elements of the methodology or theoretical framework to solve problems in a given discipline.
5. Analyze and Interpret Evidence. a. Examine evidence to identify patterns, differences, similarities, limitations, and/or implications related to the focus.
6. Analyze and Interpret Evidence. b. Utilize multiple representations to interpret the data.
7. Draw Conclusions. a. State a conclusion based on findings.
8. Interpret Information. a. Explain information presented in mathematical forms (e.g., equations, graphs, diagrams, tables, words).
9. Represent Information. a. Convert information into and between various mathematical forms (e.g., equations, graphs, diagrams, tables, words).

GT Pathways Content Criteria:

1. Develop foundational knowledge in specific field(s) of science.
2. Develop an understanding of the nature and process of science.
3. Demonstrate the ability to use scientific methodologies.
4. Examine quantitative approaches to study natural phenomena.
5. Perform hands-on activities with demonstration and simulation components playing a secondary role.
6. Engage in inquiry-based activities.
7. Demonstrate the ability to use the scientific method.
8. Obtain and interpret data, and communicate the results of inquiry.
9. Demonstrate proper technique and safe practices.

The Colorado Commission on Higher Education has approved BIO 110 for inclusion in the Guaranteed Transfer (GT) Pathways program in the GT-SC1 category. For transferring students, successful completion with a minimum C– grade guarantees transfer and application of credit in this GT Pathways category. For more information on the GT Pathways program, go to

<http://higher.ed.colorado.gov/academics/transfers/gtpathways/curriculum.html>