LIFE 102 - 003
ATTRIBUTES OF LIVING SYSTEMS
SPRING 2024

Time: MWF 2:00-2:50 PM
Location: Nutrien 140
Credits: 4
Instructor: Kimberly Jeckel M.S., Ph.D. (she/her/hers)
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Office Hours: By Appointment

Welcome to Life 102:
I am excited to be teaching Life 102 this semester and I am looking forward to meeting all of you and helping you understand the wonderful world of biology! We will be learning about many different aspects of biology including atoms, cells, macromolecules, cellular respiration, photosynthesis, DNA replication, transcription, translation, genetics, and evolution. Biology is necessary for life, important for understanding the world we live in and essential in explaining the mechanisms of living systems. I hope that you enjoy this course, learn more about biology and have fun while doing so!

Following completion of Life 102, students will be able to:
- Describe the contributions of physics and chemistry in the biological processes of life
- Explain the function, mechanism, and importance of DNA and how it regulates gene expression
- Compare mitosis and meiosis and describe how they function in eukaryotes and prokaryotes
- Define cellular structure and organization and explain the function of cellular organelles
- Evaluate the process of energy generation and flow through cellular respiration and photosynthesis
- Explain the theory of evolution and describe the connections between genetics and evolution

Textbooks and Course Materials:

- **Canvas:** The majority of course materials will be delivered via Canvas. You will need your eID to login in: https://canvas.colostate.edu/. If you are registered for LIFE102, this course will be in your listing. If you are new to CANVAS, please take the time to review the CANVAS tutorials so you can get the most out of this resource! The syllabus, announcements, lecture slides, grades, Connect assignments, Quizzes, and additional resources, will be posted on CANVAS.

- **Connect:** All-Inclusive Access by McGraw-Hill. This software includes:

    - The e-textbook "Understanding Biology" (4th Edition; Mason, Duncan, Losos; e-book)
    - LearnSmart Adaptive Learning Platform. This includes interactive materials to help explore content and refine your understanding.
    - Note, you will not be charged for Connect until the Add/Drop deadline date.

Participation: In-class, face-to-face participation will center around active learning opportunities, review questions, and clarifying muddiest points. As it is important to attend class, we strongly encourage you to attend class and participate in the provided class activities. Students who regularly attend class receive higher scores on exams and are able to master the course material.

Connect Assignments:
McGraw Hill Connect assignments will provide additional information for the material discussed in class and to check your knowledge of the concepts. Therefore, the reading and the correlated Connect assignments are designed to supplement the lectures, and in-class activities. These are REQUIRED and are part of your grade. All of the Connect assignments will be open from the beginning of the semester, and are due on Sundays of their respective weeks, so you may complete these, along with the reading, early if you choose. Please note that there will be two Connect assignments due Week 8, and Week 10, so please plan accordingly. There are 15 Connect assignments, worth 10 points each, and the *two lowest scores* will be dropped (so 130 points will count towards your grade). The first Connect assignment is due on **Sunday, January 21st**.

Canvas Quizzes:
There will be weekly Canvas quizzes administered online. The quizzes are designed to prepare you for the upcoming lecture concepts (and to review past lecture concepts). These questions will help you determine your knowledge of the topics discussed in the lectures and readings, and the goal is to identify any concepts that are confusing or unclear. These quizzes focus on important concepts, therefore, please ensure you seek help with these topics if needed (from the instructor and/or the learning assistants). The quizzes are due on Sundays at 11:59 PM. Students may take the quizzes as often as needed to receive the full points. There will be 14 quizzes, worth 5 points each, and the *two lowest scores* will be dropped (so 60 points will count towards your grade). The first Canvas Quiz is due on **Sunday, January 21st**.

Surveys:
There will be two surveys that are required. Students may opt out of having their answers used in any published research however, we will use the information to help with improving the course so, your completion is required. Each survey will be worth 5 points.

Active Learning:
Class activities are an important part of this course, not only to allow you the opportunity to work in a small group format, but also to provide alternate methods for learning/understanding the material. Active learning activities will occur during every class session throughout the semester. These activities will provide additional opportunities to work on the course concepts/material and receive help from the learning assistants and the instructor. We encourage questions and student interaction/discussion during these activities and our goal is to help you master all concepts we discuss in this course. The activities will be provided during class (either as handouts or presented on the PowerPoint slides). In-class questions, activities, and answers will NOT be posted on Canvas, however, if students wish to go over any in-class activities, questions, answers, etc., they are encouraged to meet with the instructor and/or the learning assistants.

Learning Assistants:
This course is supported by a team of Learning Assistants (LAs). LAs are undergraduate students who have successfully completed the course in a previous semester and became peer educators to help other students master the course content. Every week, LAs meet with the instructor/instructional team to prepare activities and discuss strategies for supporting student learning. LAs also receive training in teaching and learning techniques to apply in their work with students. LAs will assist with learning activities during lecture and will facilitate a variety of additional learning experiences outside of class. You can connect with LAs through: Group Learning Sessions (drop-in support in TILT's Great Hall held in the evenings each week, 5-9 PM Mon-Thur), Exam Review Sessions (which occur leading up to each exam), and individual and small group tutoring (for students who are interested in additional practice with the course concepts). Find out more about working with our LAs at: https://www.csulearningassistantprogram.org/. The Learning Assistant (LA) model is an evidence-informed, internationally recognized model of peer education proven to positively impact student success. Engaging with LAs can make the learning process more manageable and productive for students, especially in high-enrollment courses (such as Life 102). Data from the CSU Learning Assistant Program indicates that students can more effectively master the course content (earning higher grades) by engaging consistently with LAs outside of class.

Exams:
Exams will be administered in-person during class. There are four exams, with 40 questions, worth two points each (80 points total), and the *lowest score* will be dropped. The final exam, administered during finals week, will be cumulative (40 questions, worth two points each, 80 points total), and *cannot* be dropped. Therefore, it is important to learn/master all of the material we discuss in the course. It is advisable to take all exams, even if you have not studied appropriately, as the lowest exam is dropped, and this allows you the opportunity to identify areas that might be unclear or require extra help (as the final is cumulative). The learning assistants will provide review sessions before each exam. The information in this course provides a foundation for future science courses, therefore, the exam questions will require you to evaluate and synthesize the concepts discussed in lecture, rather than simply memorize facts. This is a skill that we will work on during the semester thus, attending class is essential for success in Life 102. Athletes who will miss exam days due to a CSU-sanctioned event can arrange to take the exam early, by contacting Dr. Jeckel prior to the exam. There are no make-up exams or early final exams (please arrange travel plans accordingly).

Grading:

Lecture Grade
4 Section Exams: **240 points** (4 exams, 80 points each, *lowest score dropped*)
Final Exam: **80 points** (cumulative; cannot be dropped)
Connect Homework: **130 points** (15 assignments; 10 points each; *two lowest scores dropped*)
Canvas Quizzes: **60 points** (14 quizzes; 5 points each; *two lowest scores dropped*)
Canvas Surveys: **10 points** (5 points each; cannot be dropped)
Total Points = 520 points

Final Grade
The lecture portion of the class will comprise 75% of your final grade. The Life 102 Lab will comprise the other 25% of your grade. Life 102 grades will be calculated as follows: (Lecture Grade x 0.75) + (Lab Grade x 0.25). The grade cutoffs are as follows:

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

Due to the multiple formative assessments available to students (homework, quizzes); dropping the two lowest homework and quiz assignments; dropping the lowest regular exam score, there will be no curving in this course at the end of the semester. While it can be difficult to be close to a grade cutoff, it would not be fair to other students to "bump" a student's grade if they are close to a grade cutoff. Instead, please put in effort during the semester to improve your grades by utilizing the resources available to help students: meeting with instructor, tutoring with LAs, exam review sessions, group learning sessions at TILT, completing exam main concepts, working on in-class activities, etc.

This is a content intensive course, as the intent is to provide a broad overview of important core biological concepts. However, all students can be successful in Life 102 if they are willing to devote the needed time and effort to the course. If a student requires any additional help please do not hesitate to ask, we are happy to assist in your Life 102 journey!

The dropping of the two lowest homework assignments, the two lowest quiz scores, and the lowest regular exam score is already programmed into Canvas. This will update automatically throughout the semester as new scores are added in.

Date		Lecture/Reading	Homework/Quizzes
Week 1:			
Wed	Jan 17	Introduction: Organization & Syllabus	
Fri	Jan 19	Lecture 1: Atoms & Molecules	
Smart Book: Chapter 2			**1-21-24**
Quiz #1			**1-21-24**
Reading: Chapter 2			
Week 2:			
Mon	Jan 22	Lecture 2: Bonds & Water	
Wed	Jan 24	Lecture 3: Water Properties & pH	
Fri	Jan 26	Lecture 4: Carbon Molecules	
Smart Book: Chapter 3			**1-28-24**
Quiz #2			**1-28-24**
Reading: Chapter 3			
Week 3:			
Mon	Jan 29	Lecture 5: Macromolecules	
Wed	Jan 31	Lecture 6: Proteins, Sugars, Fats	
Fri	Feb 2	Lecture 7: Cell Structure	
Smart Book: Chapter 4			**2-4-24**
Quiz #3			**2-4-24**
Reading: Chapter 4 (4.1-4.6)			
Week 4:			
Mon	Feb 5	Lecture 8: Organelles	
Wed	Feb 7	Lecture 9: Organelle Function	
Fri	**Feb 9**	**Exam 1 (Lectures 1-9)**	
Smart Book: Chapter 5			**2-11-24**
Quiz #4			**2-11-24**
Reading: Chapter 5			
Week 5:			
Mon	Feb 12	Lecture 10: Cell Transport	
Wed	Feb 14	Lecture 11: Energy & Metabolism	
Fri	Feb 16	Lecture 12: ATP & Enzyme Function	
Smart Book: Chapter 6			**2-18-24**
Quiz #5			**2-18-24**
Reading: Chapter 6			
Week 6:			
Mon	Feb 19	Lecture 13: Cellular Energy	
Wed	Feb 21	Lecture 14: Harvesting Energy	
Fri	Feb 23	Lecture 15: Cellular Respiration	
Smart Book: Chapter 7			**2-25-24**
Quiz #6			**2-25-24**
Reading: Chapter 7 (7.1-7.7)			

Week 7:

Mon	Feb 26	Lecture 16: Plants & Photosynthesis	
Wed	Feb 28	Lecture 17: Photosynthesis Reactions	
Fri	Mar 1	Lecture 18: Cellular Respiration & Photosynthesis	
Smart Book: Chapter 8			**3-3-24**
Quiz #7			**3-3-24**
Reading: Chapter 8 (8.1-8.6)			

Week 8:

Mon	**Mar 4**	**Exam 2 (Lectures 10-18)**	
Wed	Mar 6	Lecture 19: Cell Cycle & Cell Division	
Fri	Mar 8	Lecture 20: Meiosis	
Smart Book: Chapter 10			**3-17-24**
Smart Book: Chapter 11			**3-17-24**
Quiz #8			**3-17-24**
Reading: Chapter 10 (10.1-10.5; 10.7)			
Reading: Chapter 11			

Week 9

Mon Mar 11-Fri Mar 15 Spring Break - No Classes

Week 10:

Mon	Mar 18	Lecture 21: Heredity	
Wed	Mar 20	Lecture 22: Inheritance	
Fri	Mar 22	Lecture 23: Chromosomes	
Smart Book: Chapter 12			**3-24-24**
Smart Book: Chapter 14			**3-24-24**
Quiz #9			**3-24-24**
Reading: Chapter 12			
Reading: Chapter 14			

Week 11:

Mon	Mar 25	Lecture 24: Chromosomal Inheritance	
Wed	Mar 27	Lecture 25: DNA	
Fri	Mar 29	Lecture 26 Genes	
Smart Book: Chapter 15			**3-31-24**
Quiz #10			**3-31-24**
Reading: Chapter 15			

Week 12:

Mon	Apr 1	Lecture 27: Mitosis, Meiosis, Genetics	
Wed	**Apr 3**	**Exam 3 (Lectures 19-27)**	
Fri	Apr 5	Lecture 28: Transcription	
Smart Book: Chapter 16			**4-7-24**
Quiz #11			**4-7-24**
Reading: Chapter 16			

Week 13:

Mon	Apr 8	Lecture 29: Translation
Wed	Apr 10	Lecture 30: Gene Expression
Fri	Apr 12	Lecture 31: Genetic Regulation

Smart Book: Chapter 20 **4-14-24**
Quiz #12 **4-14-24**
Reading: Chapter 20 (20.1-20.7)

Week 14:

Mon	Apr 15	Lecture 32: Genetics
Wed	Apr 17	Lecture 33: Stem Cells & Cancer
Fri	Apr 19	Lecture 34: Evolution

Smart Book: Chapter 21 **4-21-24**
Quiz #13 **4-21-24**
Reading: Chapter 21 (21.1-21.6)

Week 15:

Mon	Apr 22	Lecture 35: Origin of Species
Wed	Apr 24	Lecture 36: Natural Selection
Fri	**Apr 26**	**Exam 4 (Lecture 28-36)**

Quiz #14 **4-28-24**
Reading: Chapter 23 (23.6-23.8)
Reading: Chapter 17

Week 16:

Mon	Apr 29	Lecture 37: Viruses
Wed	May 1	Lecture 38: Medicine & Biotechnology
Fri	May 3	Lecture 39: Biology & Life

Finals Week:

Tue	**May 7**	**FINAL EXAM (Lectures 1-39)**

FINAL EXAM (administered during Final Exam week, cumulative - covers material from Lectures 1-39)
FINAL EXAM will NOT be given before this date and time (Tuesday, May 7th, 7:30-9:30 AM)
FINAL EXAM: https://registrar.colostate.edu/final-exams/