LIFE 102: Attributes of Living Systems
Spring 2024

Section 002 Mon/Wed/Fri, 1:00-1:50 p.m. Plant Science C101

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Office: Biology 232
Office Hours: To Be Announced
Group Learning Sessions: Monday-Thursday, 5:00-8:00pm (Great Hall, TILT Building)
Study sessions led by LIFE 102 Learning Assistants*
Lab Coordinator: Ren García-Hellmuth, lauren.hellmuth@colostate.edu

This syllabus is subject to change by departmental or instructor notification

III. COURSE DESCRIPTION AND ORGANIZATION

LIFE102 is an introductory biology course that is intended to provide a basis for more-advanced courses in life sciences. The objective of this course is to give an overview of the many features that are common to living organisms. The topics to be covered are listed in the course outline. Some topics (*such as chemistry, cell biology, genetics, and evolution*) will be emphasized more than others. As a result, the specific lecture dates and the time spent on each topic are approximate and are subject to change.

The course meets for three lecture sessions per week and one laboratory session per week. You should be signed up for a lab. If labs are full, keep trying to register on RamWeb: some spots will open up in the first weeks of the semester as others drop. No overrides are given if the labs are full (due to fire regulations). **Lab starts on the first week of classes.**

IV. LEARNING OUTCOME GOALS FOR LIFE 102

Upon successful completion of LIFE 102, students will be able to demonstrate an understanding and knowledge of:

- The scientific method and science as a way of knowing, and the proper use of the scientific method, including observation, experimentation, and hypothesis testing
- Basic laboratory skills and practices, and the formal reporting of scientific results
- Fundamental cell biology and physiology
- Fundamental molecular biology and biochemistry, including genetics, cellular metabolism, respiration, and photosynthesis
- Fundamental population genetics and mechanisms of evolutionary change, including natural selection and speciation

V. TEXTBOOK, LAB MANUAL, AND WEBSITE

A. LIFE 102 TEXTBOOK: *Understanding Biology*, (4th ed.) by Mason *et al.*
*To reduce your course material cost, this course is participating in the **Inclusive Access Program** using **Connect for Mason's 4th Edition**, which will include online homework and access to the full text. All enrolled students are automatically included in this program.* ***Please read the applicable information at the end of the syllabus carefully.***

B. Lab Manual: All content will be delivered via your Canvas Lab Section website
C. Course Website: Access the website at https://canvas.colostate.edu/

You will need an **eID** (electronic ID at CSU, consisting of a username and a password) to access the website. If you are registered, the course will appear in your "Courses" listing (located at the upper-left side of the page). You will have access to any materials that are posted on the web site for students (such as this syllabus, online homework, the full textbook, lecture notes, exam grades, and class announcements). **Please check this website regularly.**

D. Dry-Erase Markers?

VI. EXAMS AND GRADING

Grades are based only on the regular exams, the comprehensive final exam, online Connect homework, In-Class Exercises, and the laboratory grade.

There are no opportunities for extra credit

There will be 5 exams: 4 regular exams (*40 multiple choice questions in 50 minutes*) and 1 comprehensive final exam (*80 multiple choice questions in 2 hours).* All 5 exams will cover any information discussed in lecture as well as relevant information given in the textbook.

Your lowest **regular exam grade** will be dropped automatically when your final grade for the course is calculated. The comprehensive final exam grade is **never dropped.**

There will be no early exams or make-up exams. If you miss a regular exam for any reason, that will automatically be the regular exam dropped. Any other exam(s) missed will be recorded as a zero (0) and count in the final average. The best approach is to take every quiz. Students who miss a quiz due to participating in a CSU-sanctioned event need to see the lecture instructor **well before the quiz** to make other arrangements.

There will be a total of **18 online Connect homework assignments** that will be administered **via our Canvas page**. Each homework assignment may cover any information discussed in lecture as well as relevant information given in the textbook. **Each homework assignment is worth 10 points, and is due at 1:00pm on the given due date (*see schedule for due dates*).** Your lowest 3 homework assignment grades will be dropped automatically when your final grade for the course is calculated.

Throughout the semester, there will be a variety of **In-Class Exercises** in which you are expected to **work with your classmates** to practice and master our LIFE 102 course content. Typical In-Class Exercises might include group discussions, exploring a course topic, working together to solve problems, or answering direct questions. **Learning Assistants** will be available for help and support.

VII. CALCULATION OF FINAL GRADE

The lecture portion of the class will comprise **75%** of your final grade. The laboratory portion of the class will be the remaining **25%** of your final grade.

The **75%** of your final grade that comes from the lecture portion of class will consist of your regular exam grades, your Connect homework grades, your In-Class Exercise grade, and your comprehensive final exam grade. After the 4 regular exams, your lowest regular exam grade will be dropped and the remaining 3 regular exam grades will be averaged. This regular exam average will constitute **38%** of your final grade. After all Connect homework assignments are complete, your lowest 3 homework grades will be dropped and the remaining 15 homework grades will be averaged. This Connect homework average will constitute **10%** of your final grade. Your In-Class Exercise

Grade will constitute **10%** of your final grade. The comprehensive final exam grade will constitute **17%** of your final grade.

In-Class Exercises	**10%**	
Connect Homework:	**10%**	***Drop lowest 3 scores***
Regular Exam Average:	**38%**	***Drop lowest score***
Comprehensive Final Exam:	**17%**	***May not be dropped***
Laboratory Grade:	**25%**	***May not be dropped***
FINAL GRADE:	**100%**	

GRADING SCALE

Grade	Score		
A+	100%	to	96.67%
A	< 96.67%	to	93.33%
A-	< 93.33%	to	90%
B+	< 90%	to	86.67%
B	< 86.67%	to	83.33%
B-	< 83.33%	to	80%
C+	< 80%	to	76.67%
C	< 76.67%	to	70%
D	< 70%	to	60%
F	< 60%	to	0%

VIII. POLICIES

a. Attendance - **Student attendance and participation in this course are essential to learning the material.** Students are expected to attend each class and laboratory session, be on time, and stay for the entire session. **Failure to attend will negatively affect your grade.**

b. Classroom conduct – Students are expected to assist in maintaining a classroom environment that is conducive to learning and is respectful to the instructor and the other students. Within the classroom, students are prohibited from making offensive remarks or engaging in any form of disruptive activity. Inappropriate behavior in the classroom may result in a request to leave the class at the instructor's discretion.

IX. ACTIVE LEARNING AND 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.

In this course, LAs will assist with learning activities during lecture/recitation 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), Exam

Review Sessions (which occur leading up to each exam), and 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 (like this one). 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.

XI. LIFE 102 TUTORING

Free tutoring is also available for this course through the **Arts & Sciences Tutoring Program.** No appointment is necessary and all students are welcome. For more information and tutoring schedules, please visit https://tilt.colostate.edu/Learning/Tutoring

XII. ACADEMIC INTEGRITY

Academic misconduct (*such as plagiarism, cheating or fabrication of information*) is a violation of the regulations of the University and will be reported to the Office of Conflict Resolution and Student Conduct Services. Student responsibility for academic integrity is discussed in the CSU General Catalog for 2023-2024, which can be found at https://catalog.colostate.edu/general-catalog/

XIII. TIPS ON HOW TO DO WELL IN LIFE 102

This course is **fast-paced** and covers a **large amount of material**. The exams **will be challenging**, and the majority of the lecture portion of your final grade will come from these exam grades. As a result, in order to do well in this course you should **attend each of your lectures** and **take a lot of notes**. As the quizzes will cover primarily lecture material, high-quality notes will be critical for your success in this course. The lecture slides will be provided on the course Canvas website, and it is suggested that you **print them out** and bring them to class for note-taking purposes. **Reading the textbook chapters** before each associated lecture is required and will be extremely beneficial in understanding the lecture content. The textbook has amazingly-helpful internet-based study methods; they will without a doubt be helpful and lead to a higher final grade. **Arrive to class prepared so you can fully engage in the In-Class Exercises and utilize our Learning Assistants.** In order to fully-digest the content covered in this course, you must set yourself up for success by **not falling behind**; it may not be possible for you to catch up. **DO NOT WAIT UNTIL THE LAST MINUTE TO BEGIN STUDYING**…!! Plan to spend 2-3 hours of home study for every hour in the classroom.

XIV. TENTATIVE SCHEDULE OF TOPICS AND REQUIRED READING

(The instructor has the right to modify the schedule or any part of the syllabus at any time.)

Week	Dates	Evaluation	Lecture Topic	Chapter
1	Jan 15	**No Class**	**Martin Luther King Jr. Day**	**None**
	Jan 17		Course Introduction	Syllabus
	Jan 19		The Nature of Molecules	2
2	Jan 22	**Homework #1 (Ch2)**	The Properties of Water	2
	Jan 24		The Properties of Water / Carbon	2 / 3
	Jan 26		Carbon / Chemical Building Blocks of Life	3
3	Jan 29	**Homework #2 (Ch3)**	Chemical Building Blocks of Life	3
	Jan 31		Chemical Building Blocks of Life	3
	Feb 2		Cell Structure	4
4	Feb 5	**Homework #3 (Ch4)**	Cell Structure	4
	Feb 7		Cell Structure	4
	Feb 9	**EXAM ONE: Section 1**	***EXAM ONE: Section 1***	**None**
5	Feb 12		Membranes	5
	Feb 14	**Homework #4 (Ch5)**	Membranes	5
	Feb 16		Energy and Metabolism	6
6	Feb 19	**Homework #5 (Ch6)**	Energy and Metabolism	6
	Feb 21		How Cells Harvest Energy	7
	Feb 23	**Homework #6 (Ch7)**	How Cells Harvest Energy	7
7	Feb 26		Energy / Photosynthesis	7 / 8
	Feb 28	**Homework #7 (Ch8)**	Photosynthesis	8
	Mar 1		Photosynthesis	8
8	Mar 4	**EXAM TWO: Section 2**	***EXAM TWO: Section 2***	**None**
	Mar 6		How Cells Divide	10
	Mar 8	**Homework #8 (Ch10)**	Sexual Reproduction and Meiosis	11
9	Mar 9-17	**No Class!!**	**SPRING BREAK**	**None**
10	Mar 18		Meiosis / Patterns of Inheritance	11 / 12
	Mar 20	**Homework #9 (Ch11)**	Patterns of Inheritance	12
	Mar 22	**Homework #10 (Ch12)**	Inheritance / Chromosomes	12 / 13
11	Mar 25		Chromosomes, Mapping, and the Meiosis-Inheritance Connection	13

	Mar 27	**Homework #11 (Ch13)**	Chromosomes, Mapping, and the Meiosis-Inheritance Connection	13
	Mar 29	**EXAM THREE: Section 3**	***EXAM THREE: Section 3***	**None**
12	Apr 1		DNA: The Genetic Material	14
	Apr 3	**Homework #12 (Ch14)**	DNA / Genes and How They Work	14 / 15
	Apr 5		Genes and How They Work	15
13	Apr 8	**Homework #13 (Ch15)**	Genes and How They Work	15
	Apr 10		Genes / Viruses	15 / 23
	Apr 12	**Homework #14 (Ch23)**	Viruses / Biotechnology	23 / 17
14	Apr 15		Biotechnology	17
	Apr 17	**Homework #15 (Ch17)**	Biotechnology	17
	Apr 19	**EXAM FOUR: Section 4**	***EXAM FOUR: Section 4***	**None**
15	Apr 22		Genome Evolution	18
	Apr 24		Evidence for Evolution	20
	Apr 26	**Homework #16 (Ch20)**	Evolution / Genes Within Populations	20 / 19
16	Apr 29		Genes Within Populations	19
	May 1	**Homework #17 (Ch19)**	Populations / The Origin of Species	19/ 21
	May 3	**Homework #18 (Ch21)**	The Origin of Species	21
17	May 7 4:10 pm – 6:10 pm	**FINAL EXAM** **(Clark A101)**	**FINAL EXAM:** **Sections 1 – 4 (half of the questions) +** **Section 5 (half of the questions)**	**None**

XV. CONNECT AND ITS USE IN LIFE 102

For this course, you will be required to purchase McGraw-Hill Education Connect® access for *Understanding Biology*, (4th ed.) by Mason *et al.* You may choose not to buy a print text since Connect contains the full reading experience. Please be aware if you purchase a used textbook you will still need to purchase Connect access to complete required assignments that make up **10% of your total course grade**.

Connect is an easy-to-use homework and learning management solution that embeds learning science and award-winning adaptive tools to help you get the best results in this course. It is designed to create a personalized pathway for your success, making every minute you study more effective. Using adaptive technology, Connect pinpoints exactly what you know and don't know yet, and seamlessly offers up learning resources in real time to help you focus your study time. Connect contains the interactive eBook and study tools, giving you anytime access to course resources and assignments.

How to get Registered on Connect:

To begin, you need to **purchase Connect access**.

Purchase from Connect integrated in Canvas:

Purchase online directly from our Canvas course homepage by **clicking on the first assignment**. Purchasing Connect online is the best value for your required course materials – typically half the price of the printed textbook bundle. A low-cost print-upgrade option is also available via Connect if you find yourself wanting a print companion at some point during the semester. This will be a full color binder-ready version of the text shipped at no charge.

Expectations and Policies Related to Course Assignments:

All course assignments will be scheduled, completed and recorded in Connect. **All students are required to complete every assignment by the due date listed**.

Getting Technical Support:

If having trouble registering or accessing Connect, please contact McGraw-Hill's Customer Support for the fastest help. Live chat, email, and phone support are available almost every hour of the day.

Website: http://www.mhhe.com/support

Phone: (800) 331-5094

Hours (EST) Sunday: 12 PM - 12 AM Monday - Thursday: 24 hours

Friday: 12 AM - 9 PM Saturday: 10 AM - 8 PM

Ensure your computer meets system requirements by going to this link:

http://connect.mheducation.com/connect/troubleshoot.do

XVI. INCLUSIVE ACCESS PROGRAM

ACCESS INSTRUCTIONS FOR STUDENTS:

- You will be granted access to McGraw Hill's Connect on the first day when you access CONNECT via your instructor's CANVAS shell.
- If you (the student) choose to opt out of the program provided by the CSU Bookstore, you must purchase the access code on your own. The price through Inclusive Access is the best price available so you will likely pay a higher price for purchasing access elsewhere.
- If you choose not to opt you will have access to the materials for the duration of the semester.

PRICING and BILLING INFO

- After the add Add/Drop date the charge for the materials at the Inclusive Access price will be billed to your CSU student account, (unless you have chosen to opt out of the program).
- The price through Inclusive Access is the best price available.

Opting Out of Inclusive Access

- If you choose an alternate method of access to the online content and homework platform, you must opt out of the Inclusive Access program prior to the Add/Drop date to avoid billing.
- Once opted out, you must purchase the access code on your own to the homework platform and e-text.
- If you opt out by accident, you can email kurt.kaiser@colostate.edu to have access re-instated and billed. Include your name, department, course, section and student number in your request.

Dropping the course

- If you drop the course *prior to* the Add/Drop deadline, you will automatically be opted out and will not be billed.
- If you drop the course *after* the billing deadline, you will have **5 days** to notify the Inclusive Access team to request a refund.

The Colorado Commission on Higher Education has approved **LIFE 102** 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://highered.colorado.gov/academics/transfers/gtpathways/curriculum.html.

The content criteria and student learning outcomes (SLOs) listed below are required for GT-Pathways courses in the Natural and Physical Sciences content area, in the GTSC-1 (Lecture course with required laboratory) category. The peculiar numbering of the SLOs is due to the fact that they are excerpted from a comprehensive list of SLOs across all GT-Pathways courses. The SLOs are listed within categories that the GT-Pathways program calls "competencies" and are displayed in italics below.

GT Pathways Natural & Physical Sciences - Course with Required Laboratory (GT-SC1)
Content Criteria:

1. The lecture content of a GT Pathways science course (**GT-SC1**):
    a. Develop foundational knowledge in specific field(s) of science.
    b. Develop an understanding of the nature and process of science.
    c. Demonstrate the ability to use scientific methodologies.
    d. Examine quantitative approaches to study natural phenomena.
2. The laboratory (either a combined lecture and laboratory, or a separate laboratory tied to a science lecture course) content of a GT Pathways science course (**GT-SC1**):
    a. Perform hands-on activities with demonstration and simulation components playing a secondary role.
    b. Engage in inquiry-based activities.
    c. Demonstrate the ability to use the scientific method.
    d. Obtain and interpret data, and communicate the results of inquiry.
    e. Demonstrate proper technique and safe practices.

GT Pathways Natural & Physical Sciences - Course with Required Laboratory (GT-SC1)
Competencies:

Inquiry & Analysis

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.
    b. Utilize multiple representations to interpret the data.
6. Draw Conclusions
    a. State a conclusion based on findings.

Quantitative Literacy

1. Interpret Information
    a. Explain information presented in mathematical forms (e.g., equations, graphs, diagrams, tables, words).
2. Represent Information
    a. Convert information into and between various mathematical forms (e.g., equations, graphs, diagrams, tables, words).