

# LIFE 210 COURSE SYLLABUS

## INSTRUCTOR INFORMATION

Instructor: Paul Laybourn, Ph.D., Professor of Biochemistry and Molecular Biology

Email: paul.laybourn@colostate.edu

Phone: 970-491-5100

## TECHNICAL SUPPORT

Need technical assistance with the LIFE 210 Canvas course? Try the following:

- Visit the [Canvas Student Resources](#) for guides and videos.
- Visit [Central I.T. Technical Support Helpdesk](#) for technical support.
- Call 970-491-7276.
- Email [Help Desk Support](#).

## COURSE DESCRIPTION

Cell biology is the molecular and chemical underpinnings of how and why life (cells and organisms) works. Introductory Eukaryotic Cell Biology will focus on the structure and function of macromolecules built from amino acids and membrane lipids and the cellular processes based on proteins and membranes. Until we invent cameras to record the processes firsthand, understanding cell biology means interpreting data providing indirect evidence for how things work.

A complete understanding of cell biology rests on the foundation consisting of three core areas or key concepts. These areas are 1) the cell **parts** – macromolecules, 2) cellular **processes** – protein folding, catalysis, transmembrane transport, protein trafficking, metabolism, cell signaling, cell shape and movement, cell cycle, apoptosis and senescence and 3) cellular **driving forces** – chemistry of functional groups, diffusion/random events, dynamic equilibrium, bioenergetics. These key concepts are central to understanding normal cell function and behavior and how they go awry in cancer cells. These key concepts provide a framework for making sense of cell biology. Cells are very complex and learning all the cellular parts and processes can be overwhelming. Focusing at this “10,000 foot level” first before learning the myriad details can make learning cell biology more approachable.

Students will learn core concepts and definitions in cell biology. Understanding and critical thinking are most important and lasting. However, knowing a certain amount of content knowledge and learning the cell biology “language” is required for hanging that understanding on.

Students will gain an “appreciation” for the field of cell biology. I hope you come away from this class thinking that cell biology is cool and excited to learn more and in greater depth. This course will only give you the tip of the iceberg, but I hope it will provide a springboard for delving into your future areas of interest in more detail.

## COURSE PREREQUISITES

LIFE 102; CHEM 111; CHEM 112

## COURSE GOALS

Upon the completion of LIFE 210, a successful student will be able to:

- Know what the cell parts, processes and driving forces are;
- Explain the properties and functions of cellular macromolecules, various cellular processes and the driving forces of cellular processes;
- Illustrate the structure and function of cellular macromolecules and sketch the various cellular processes and predict the role of cell driving forces in these cellular processes;
- Summarize the structure and function of cellular macromolecules and cellular processes and infer the role of cell driving forces in them;
- Integrate the structure and function of cellular macromolecules, evaluate cellular processes and propose the role of cell driving forces in them;
- Recommend targets for anticancer drugs based on the structure and function of cellular macromolecules, cellular processes and the role of cell driving forces.

## REQUIRED TEXTS

Molecular Biology of the Cell, 5<sup>th</sup>, 6<sup>th</sup> or 7<sup>th</sup> edition, by Alberts et al., Garland Science Publishers, ISBN-13: 978-0815341055 SBN-10: 0815341059 ISBN-13: 978-0815344322 ISBN-10: 0815344325.

The course textbook is available through the **CSU Bookstore's Inclusive Access Program** in partnership with Unizin Engage. You have immediate access to the online e-text by clicking on the "Manage eResources" link within the course menu in the LIFE 210 course. Please note, there is a cost for the e-text. The bookstore will charge your student account for the cost of the e-text after the Add/Drop date, August 28, 2023. You must "opt-out" of the etextbook before the Add/Drop date to avoid bookstore charges. Please look for emails from the "CSU bookstore" about accessing the eTextbook and 'opting out', as well, as charges to your student account. These emails will be sent to your official CSU email address. To opt out, follow the link in the emails or click on the Manage eResources tab in Canvas. This letter is also posted under the Course Information Module on the LIFE 210 Canvas course. Once you choose to "opt-out," you will no longer be allowed to access the e-text in Canvas.

## OTHER REQUIRED AND SUPPLEMENTAL MATERIALS

### Assignments

How will you know that you have learned and understood the LIFE 210 core concepts and ideas? What will your grade be based upon?

#### 1. 11 Module Quizzes – 50 points total

The quizzes will be administered on Canvas. They will be posted every Friday (see course schedule), except the Fridays of the four exams and will be due on the following Monday before class time (noon). There will be 11 quizzes and you will be given two attempts on each.

#### 2. 5 Exams – 500 points total

There will be five exams worth 100 points apiece. The exams will be administered on Canvas. The exams will only cover what we talk about in class and emphasize in the study guides and quizzes. Each exam will be available for a four-day period (for example exam 1 is available starting Monday September 7 at 12:01 AM and ending Thursday September 10 at 11:59 PM. You will have two hours to complete the true/false portion of the exams. Exams will consist of around 80 true/false questions and four five-part free

response questions, of which you choose only three to answer. The T/F portion of the exams are closed notes, textbook, internet, etc. and will be answered online. The free response portion of the exams will be answered offline on paper and will be due by email submission to me in two days after the T/F portion is due. Please scan your answers using the free app Turboscan or equivalent as a single pdf.

**3. Active Learning Activity Homework** – 75 points, 5-10 points each activity, 8 activities

There will be eight active learning activities to provide interactive, hands-on and engaging means to better grasp difficult concepts. These activities are designed to integrate core concepts and big ideas. Each learning activity will have pre- and post-homework assignments worth 5 points each. The learning activities will focus on thermodynamics, protein structure, transmembrane transport, nuclear-cytoplasmic transport, metabolic regulation and cellular shape and crawling.

**4. Critical Thinking Discussions** – 15 points extra credit if you participate in 75%. There will be weekly voluntary group activities. These activities will facilitate group problem solving and discussions on course related materials. Participation in group activities is not required. However, students can earn 15 extra credit points by participating in 75% (7-8) of the group activities.

**5. Discussion Board Posts** (Coffee Shop) and **Weekly Questions Surveys**

Submission of Discussion Board posts under the pinned Coffee Shop threads and completing the Weekly Questions Surveys are not required. However, each Discussion Board post and survey completion is worth 1 extra credit point.

### Course Materials

I will provide materials on Canvas to help you grasp my organization of the course content. These materials define what concepts I want you to know and understand. The materials also aid your study outside of class.

1. Text and supplemental article reading
2. 15 Module outlines
3. Lecture slides for taking notes (pdf)
4. Module study guides (and answers)
5. Lectures Recordings
6. Recitation Exercises (and answers)
7. In class learning activity homework assignments

## ACADEMIC INTEGRITY POLICY

By registering for this class, you enter into a contract between each student (you) and the instructor (me) constituting an agreement on our respective roles in gaining the knowledge and understanding of cell biology and earning the grade that you desire. As the instructors, our role is to organize and present the material and stimulate, facilitate and guide you through learning and understanding the core concepts in eukaryotic cell biology. As the student, your role is to complete the course materials. If you wish to do well in this course (earn an A or B), I strongly suggest that you watch all the recordings, complete all the assignments, use the study guides (answer the questions to the best of your ability on your own, then check your answers against the answers we post), form study groups, schedule office hours with the instructors to clarify concepts, and study by *practicing* rather than merely looking over your notes (please ask us if you do not know what this means).

This course will adhere to the CSU Academic Integrity [Policies and Guiding Principles](#) as found in the General Catalog and the [Student Conduct Code](#).

Academic integrity is conceptualized as doing and taking credit for one's own work. Violations of the university's academic integrity standards include, but are not limited to:

- Cheating—includes using unauthorized sources of information and providing or receiving unauthorized assistance on any form of academic work or engaging in any behavior specifically prohibited by the faculty member.
- Plagiarism—includes the copying of language, structure, ideas, or thoughts of another, and representing them as one's own without proper acknowledgment.
- Unauthorized Possession or Disposition of Academic Materials—includes the unauthorized selling or purchasing of examinations or other academic work; stealing another student's work; unauthorized entry to or use of material in a computer file; and using information from or possessing exams that an instructor did not authorize for release to students.
- Falsification—includes any untruth, either verbal or written, in one's academic work.
- Facilitation—includes knowingly assisting another to commit an act of academic misconduct.

At a minimum, violations will result in a grading penalty in this course and a report to the Office of Conflict Resolution and Student Conduct Services.

## CSU HONOR PLEDGE

Academic integrity lies at the core of our common goal: to create an intellectually honest and rigorous community. Because academic integrity, and the personal and social integrity of which academic integrity is an integral part, is so central to our mission as students, teachers, scholars, and citizens, I will ask that you affirm the CSU Honor Pledge as part of completing your work in this course. *While you will not be required to affirm the honor pledge*, you will be asked to affirm the following statement at the start of your exams:

*"I have not given, received, or used any unauthorized assistance."*

Further information about Academic Integrity is available at CSU's [Practicing Academic Integrity](#).

## UNIVERSAL DESIGN FOR LEARNING

I am committed to the principle of universal learning. This means that our classroom, our virtual spaces, our practices, and our interactions be as inclusive as possible. Mutual respect, civility, and the ability to listen to others carefully are crucial to universal learning.

If you are a student who will need accommodations in this class, please contact me to discuss your individual needs. Any accommodation must be discussed in a timely manner prior to implementation. A verifying memo from [Resources for Disabled Students](#) may be required before any accommodation is provided.

## COURSE PRESENTATION AND PROCEDURES

Organization of content: 1 module/week administered comprised of readings, lectures, recordings, learning activities and quizzes. | Students should complete all tasks in each module before moving on.

## SUGGESTED STUDY METHODS

Come to the lectures prepared (know something about what I will talk about) having read the textbook pages and looked over the lecture outlines and the study guide questions for the lecture. Review lecture notes and the study guide questions and attempt to answer these questions on your own. If you do not have a good understanding of the questions and how to answer them ask about them by email or by posting your question on the Canvas Discussion Board "Coffee Shop." First and foremost, space out your studying. Do not "cram" in the day or before an exam. Rather spend time each day studying the course material. Use the quizzes, recitation exercises and study guides as practice for the exams. Study your notes including key terms and concepts, and then take the quiz the first time without your notes. If you do not do as well as you would like, review your notes again and take the quiz a second time with your notes and book open. Finally, I strongly suggest that you **practice diagramming the cellular and biochemical processes on a white board multiple times** rather than just looking over them in order to study them **and that you start this process a few weeks before the exams**. You will find the information sticks in your memory much more quickly and you will recognize gaps in your understanding more readily. Using this approach in a study group is even more effective.

College education requires skills and habits that may be less essential in high school courses. In order to be successful in this course you will need:

- Space—Establish a comfortable and well-organized physical workplace.
- Time management skills—Set personal study and "classroom" time as you would do for a traditional course.
- Organization skills—Print out all class material (modules, PowerPoints, assignments, additional resources, and any work you generate) and keep everything in a single location. Maintain electronic backups of all class materials.
- Communication skills—Demonstrate a willingness to interact with your instructor and classmates through email, phone calls, discussion boards, and active participation in all class activities.
- Initiative—Seek help from your instructor and classmates, ask questions as they arise.
- Discipline—Pace yourself, complete all activities and assignments before the due date, follow through on all class requirements to completion.

The more closely you adhere to the recommendations above the greater your chances of having a successful semester and a rewarding experience.

## GRADING

As a student enrolled in this course, one of your responsibilities is to submit course work by the due dates listed in the Course Schedule. With that said, I take my role as your instructor very seriously, and, in fact, I care about how well you do in this course and that you have a satisfying, rewarding experience.

There is a total of 500 points for exams, 50 points for quizzes and 75 active learning activity homework assignment points possible. Each of the 5 exams in LIFE 210 will be worth 100 points each (500 total).

Each of the 11 quizzes will be worth 5 to 7 points but their value in your final grade will be scaled to 50 points total possible (for example, 55 points/1.1 = 50 points possible). This brings the total possible points to 625. If you achieve the following point totals for LIFE 210 you will be assured of the **minimum** letter grade shown:

562.5-625 ( $\geq 90\%$ )	A
500-562 (80-90%)	B
437.5-499 (70-80%)	C
375-437 (60-70%)	D
<375 (<60%)	F

Each exam will not be curved individually, but the final total points required for a particular course grade might be curved downward depending on the averages and distribution of points. In addition, your grade for LIFE 210 will be determined based on the total 625 points (combined). Students in LIFE 210 have averaged around 78 to 80% of the total points possible over the past several years. As a result, there is usually no grading curve. Please note that plus/minus grading will be used, but 90% is an A, etc.

#### **Missed Exams and Re-grading of Exams**

There will be no make-up exams offered. Exams or quizzes you have missed without an excuse will be graded as zero. If you have an excused absence (based on written or other verifiable evidence) from an exam or quiz, your final grade will be based on a percentage of the total possible points for the exams and quizzes you did take. Students can schedule to take an exam early with the instructor if they know they cannot take the exam at the regularly scheduled date and time. If you have questions concerning the grading of any of your exams or quizzes, the questions you want re-graded should be circled and the exam or quiz should be turned in to the instructor within one week of the date of its return to the class after grading. You must also provide a written explanation as to why you feel the question should be re-graded. A written request just saying that you thought you have the correct answer because you do is insufficient. You need to specifically say why what you wrote was correct and how it was correct (answered the question). The point is for you do go over your answer and the answer in the key and figure out why your answer was correct or incorrect. Then you need to make an argument in writing convincing me that you knew what you were talking about. Exams will not be accepted for re-grading after this one-week period, so go over your exam carefully soon after it has been returned to you.

## **ASSIGNMENT DETAILS**

Quizzes will consist of 10 to 12 multiple choice questions taken on Canvas. Exams will consist of 82 T/F questions worth 0.67 points each (54.94 points total) and three free response questions worth 15 points each (45 points total). Note that exams are worth 99.94 points total even though Canvas indicates they are worth 114.94 points. The T/F questions will be drawn from the quiz questions. The free response questions will be based on the study guide and recitation activity questions.

## **GRADE DESCRIPTION**

<b>97.5-100 % = A+</b>	<b>90-97.4 % = A</b>	<b>88.8-90 % = A-</b>
<b>87.5-88.7 % = B+</b>	<b>80-87.4 % = B</b>	<b>78.8-80 % = B-</b>
<b>77.5-78.7 % = C+</b>	<b>70-77.4 % = C</b>	
	<b>60-69.9 % = D</b>	
	<b>0-59.9 % = F</b>	

## EXAM MAKE UP POLICY

There will be no make-up exams offered. Exams or quizzes you have missed without an excuse will be graded as zero. If you have an excused absence (based on written or other verifiable evidence) from an exam or quiz, your final grade will be based on a percentage of the total possible points for the exams and quizzes you did take. Students can schedule to take an exam early with the instructor if they know they cannot take the exam at the regularly scheduled date and time.

## SYSTEM, MULTIMEDIA, AND SOFTWARE REQUIREMENTS

Having trouble with the multimedia in this course? See the solutions below. Also, it is highly recommended that you access your course via a **high-speed Internet connection**.

- Problems with opening PDFs?
  - Download [Adobe Reader](#).
- Canvas acting funny?
  - Review Canvas guide for [Supported Browsers](#).
- YouTube videos not playing?
  - Download [Flash Player](#).
- Videos not opening or playing on your Mac?
  - Download [Windows Media Components for QuickTime](#).
- Still having issues:
  - Call the **CSU Help Desk at 970-491-7276** or [Email Help Desk Support](#)

You must have speakers installed and working properly on your computer before beginning the course.

You may need access to Microsoft Word, PowerPoint, and/or Excel to complete assignments. If you do not have access to the Microsoft Office applications, you may use one of the following free resources that allow you to save your files with Microsoft Office file extensions (.doc, .docs, .ppt, .xls.):

- [Google Apps for CSU](#)—a free, outsourced communications suite endorsed by The University Technology Fee Advisory Board (UTFAB)
- [Office 365](#)—the full version of Microsoft Office free of charge for CSU students.