



BIOLOGY
COLORADO STATE UNIVERSITY

BZ 310-001 – CELL BIOLOGY

Spring 2024

Canvas Page: <https://colostate.instructure.com/courses/175904>

Students have automatic access to the Canvas site for the course.

Instructors and teaching assistant

Instructors

1. Arjun Khakhar, Assistant Professor, Office # 448 Biology,
arjun.khakhar@colostate.edu
2. Salah Abdel-Ghany, Associate Professor, Office # 408 Biology,
Salah.Abel-Ghany@colostate.edu

Teaching assistants (TA)

1. Sean Boland: sboland@rams.colostate.edu
2. Ashley Breusing: abreusing@colostate.edu

Professor Abdel-Ghany will teach the first eight weeks of the semester and then Professor Khakhar will take over after Spring break.

Email is the best way to communicate with us. Please Include “BZ 310-SP24” in the subject line.

Please direct emails to Professor Abdel-Ghany during the first half of the semester and to Professor Khakhar during the second half of the semester.

Office hours and review sessions

Office hours:

Each of the two teaching assistants will have TWO office hours sessions every week with 1 hour each session. Class will have a total of 4 office hours each week. During these office hours you can meet the TA, get help in the weekly quizzes, and discuss any class related matters.

Office hours will be in Room 128 Biology building.

Office hours schedule:

Sean Boland:

Tuesday 9:00am – 10:00am.

Thursday 9:00am – 10:00am

Ashley Breusing:

Wednesday 9:30am – 10:10:00am.

Friday 9:30am – 10:10:00am.

Review sessions:

In addition to the weekly office hours, instructors will hold review sessions before exams. Time and location will be scheduled and announced ahead of time.

Also, we are happy to schedule a time to discuss any class-related matters and provide advice to any student. Please email the specific professor or the specific TA with a few options for when you can meet.

Lectures

MWF 1:00-1:50 (Room 131 Behavior Science Building, BSB).

Textbook

“Essential Cell Biology, 5th edition, Alberts et al., (2019).

The textbook will be used as reference material and can be purchased from the CSU Bookstore or borrowed from the library, however, there are limited copies there so they might not always be available. (<https://www.bookstore.colostate.edu/SelectTermDept>).

Laboratory exercises

- The lab section is complementary to the class. The lab represents 30% of the class grade. A student must pass the lab to pass the course.

- A separate lab syllabus will be available on the BZ310 laboratory section on your CANVAS page.
- Labs meet weekly for 3 full hours in room 303 Yates building.

Goals and Objectives for BZ310 - lecture and lab

The overall goal of this course is to give an overview of cell biology and to train students to think as biological scientists. Students will get insight into how problems are solved in modern cell biology and will learn about the workings of cells (mostly eukaryotic ones). This is an undergraduate, upper-division course. We assume that students know fundamental concepts of biology, chemistry, and biochemistry as covered in courses such as LIFE102 and introductory CHEM 113.

Overall Course Objectives:

After taking this course, students should be able to

- describe the most important cellular components and processes in the context of their structures to functions.
- demonstrate the connections between basic molecular structure and cellular functions.
- apply models to concepts in cell biology and be able to interpret and complete essential diagrams.
- explain methods and techniques in cell biology including their uses and limitations. This includes interpretation of cell biology data.

Developmental Objectives:

Students will gain experience with:

- active learning processes.
- working in small groups as teams and sharing data.
- the process of data documentation, analysis, and interpretation.
- communicating complex ideas through writing.
- time management skills including preparation and organization of parallel tasks.
- analyzing connections between concepts.
- troubleshooting research problems that a scientist might encounter.

STUDY TIPS

Some tips that help you achieving both course objectives and your goals:

1. Attend lectures, make your notes during lectures, re-work your notes the same day, and then make your summaries. While doing this, highlight the important parts.
2. We highly encourage you to write out your notes by hand (on paper or on a tablet), rather than using a laptop. Studies have shown that *“in the classroom setting students who write out their notes by hand have a stronger conceptual understanding and are more successful in applying and integrating the material than those who take notes with their laptops”*. Watch the “American taking notes with a laptop” under course information modules.
3. Important parts are those we repeat, mention as questions in the lecture, highlight or write in different fonts/different colors in the presentations, or those explained on the whiteboard.
4. Disable the notifications during the lecture.
5. Ask questions whenever needed. Never feel shy asking questions. By asking questions, you are helping yourself and your classmates. Do not underestimate the value of any question you might ask. “We are here to answer your questions”.
6. Be active candidate in the classroom. This improves your critical and higher-level thinking skills.
7. Study in groups and share notes whenever possible, especially during exam preparations.
8. Participate in review sessions and office hours. Our experiences have shown that “students who attend review sessions and office hours accomplish the highest grades among their peers”.
9. Sit in the front rows if you can. Studies have shown that “students who are in the front rows are typically more attentive than those in the back”. Also, you might need to work in a small groups to answer interactive Clicker questions.
10. Set up a high goal and be optimistic to achieve it. We will help you as long as you show motivation.

Assessments

Midterm and Final Exam (400 points total, 40% overall grade)

There will be one exam before spring break covering material taught in weeks 1-8 (200 pt) and a final exam at the end of the course covering material taught in weeks 9-15 (200 pts). The midterm will be taken on Friday March 8th in the classroom during lecture time. The final exam will be on Tuesday May 7 (4:10-6:10 pm). The final exam date might change, please check the announcements when time comes.

Exam	Date	Lecture Materials	Points	Time and location
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Midterm	Friday March 8	Weeks 1 → 8	200	1:15 pm lecture room
Final	Tuesday May 7	Weeks 9 → 15	200	4:10-6:10, lecture room

- Exams must be taken on the scheduled date.
- Makeup exams will only be given to students with a university-approved proof of excuse.

Weekly quizzes (200 points total, 20%)

One quiz will be assigned each week (except week when there will be an exam). quizzes will be posted on Canvas no later than Sunday night and will be due on Canvas by Sunday 11:59 pm following that week (i.e., seven days later).

If students have a medical reason for not completing a quiz, they are asked to email both teaching assistants to enable the accommodation.

There will be a total of 13 weekly quizzes including one review quiz due in the first week. The take-home quiz contains review questions associated with your former coursework (LIFE102, BZ120 or CHEM 113). This is an opportunity to review the prerequisite materials that will be used in cell biology course. You are encouraged to search the web, review your old notes, ask us or your classmates.

Take-home quiz: due on Sunday, 1/21-midnight (20 pts)

Assignment 1: ----- 1/28-midnight (15 pts)

Assignment 2: ----- 2/04-midnight (15 pts)

Assignment 3: ----- 2/11-midnight (15 pts)

Assignment 4: ----- 2/18-midnight (15 pts)

Assignment 5: ----- 2/25-midnight (15 pts)

Assignment 6: ----- 3/03-midnight (15 pts)

Assignment 7: ----- 3/24-midnight (15 pts)

Assignment 8: ----- 3/31-midnight (15 pts)

Assignment 9: ----- 4/07-midnight (15 pts)

Assignment 10: ----- 4/14-midnight (15 pts)

Assignment 11: ----- 4/21-midnight (15 pts)

Assignment 12: ----- 4/28-midnight (15 pts)

In class activities and participation via iClicker (100 points total, 10%)

We will use iClicker Cloud technology to ask interactive questions during the lectures. Students must access the iClicker application while they are in the classroom. There will be 2.5 points assigned for each iClicker session and a student will receive 60% (1.5 point) for just submitting answers even if those answers are incorrect and full points (2.5 points) for submitting the correct answer. This is to incentivize engagement with the material being presented in class. As this is worth a significant percentage of the grade (10%), getting a good grade will require regular attendance and active participation with in-class activities, as measured via iClicker response.

- **What if I have an emergency/tech issue that makes me miss clicker questions?** We will drop the four lowest scores for iClicker participation, so students can still receive full credit (100 pts) if they miss up to four lectures/sessions. The reason for dropping the four lowest grades is to accommodate unforeseen events that prevent attendance and participation in individual lectures/sessions. Therefore, missed classes will have to count towards these four drops. You should be enrolled with iClicker automatically or receive an invitation email if you do not have an iClicker account set up yet. Also, you can join the BZ310 iClicker via this link (<https://join.iclicker.com/HNRJ>) . This technology allows you to answer polling questions with a personal device such as a smartphone, a laptop, or equivalent technology.

Honors Section

Cell biology is also offered with an honors section that students can sign up for. To do this please contact Professor Khakhar (khakhar@colostate.edu) by **Monday January 22nd, 2024**. Students enrolled in the honors section will be responsible for reading the following novel about cell biology (<https://www.amazon.com/Song-Cell-Exploration-Medicine-Human/dp/1982117354>) over the first two months of the course. In the last month of the semester students will write a 2-page book report on something interesting they learned from the book that pertains to the role of cell biology in medicine. This will be submitted as three assignments spaced a week apart, a bullet point-based map of the argument in their book report, a draft of their book report, a proofread final version of their book report modified for concision. Honor section grade is not part of the class grade, rather it is a satisfactory/unsatisfactory (S/U) separate grade.

Grading Scale

Grades will be calculated according to the following breakdown:

- Lab components 300 pts

▪ Midterm	200 pts
▪ Final exam	200 pts
▪ Weekly quizzes	200 pts
▪ In class activities/iClicker	100 pts

Total possible points 1000 pts

Individual assignment and individual exam grades will not be curved. At the end, the individual student's fractional grades will be rounded to the nearest whole number (e.g., 69.6 = 70 and 69.4 = 69). Then grades will be calculated according to the following grading scale:

< 95	A+
90 - 95	A
85 - 89	A-
80 - 84	B+
75 - 79	B
70 - 74	B-
65 - 69	C+
60 - 64	C
55 - 59	D
>55	F

Regrading of Exams or Quizzes

If a student has concerns about grading, he/she must present the exam/quiz for regrading within one week of when it was returned. We are happy to discuss how an exam or quiz was graded at any point, but formal regrade requests will only be accepted within the one-week time window. For any regrade requests, the entire exam or quiz (not just individual questions) will be regraded. Therefore, it is possible a student loses points on a regrade if we find that credit was mistakenly given for incorrect answers.

Students with Special Needs

Students requesting exams or classroom accommodations should contact the student disability center located in room 121 TILT building (<https://disabilitycenter.colostate.edu>). The phone number is (970) 491-6385. They will approve the request and communicate with us.

Academic Integrity

Exams are to be completed by each student on their own without assistance from other individuals, including other students in the course. For weekly quizzes, it is permitted to work with other students to arrive at an answer for each question. **Your TAs are not permitted to help you with answers; however, they will explain concepts to you if things are unclear.** It is not acceptable to copy answers verbatim from another student, the textbook, online sources, or a solutions manual. Written answers must be provided in your own words. Recognizably copied answers will receive zero credit and be considered cheating. The use of online "homework helper" sites is not permitted in this course. Use of these types of resources will be considered receiving unauthorized assistance and, therefore, a violation of the student conduct code. This course will adhere to the CSU Academic Integrity Policy as found on the Student Responsibilities page of the CSU general catalog.

<http://catalog.colostate.edu/general-catalog/policies/students-responsibilities/#academic-integrity>

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

Tentative Lecture Schedule and Topics

Week	Start Date	Modules #	Chapters	Instructor	Exams/assignments
1	16-Jan	Course Introduction & Unity of life	1	Salah	Take-home quiz, Sunday 1/21
2	22-Jan	Defining cells Cell Chemistry Energy carriers	1 2 3	Salah	Assignment 1, Sunday 1/28
3	29-Jan	Tools for cell biology Analyzing the structure and function of genes	4 (pg.157-169) 10	Salah	Assignment 2, Sunday 2/4
4	05-Feb	Protein structure and function	4	Salah	Assignment 3, Sunday 2/11
5	12-Feb	Regulation of gene expression	9	Salah	Assignment 4, Sunday 2/18
6	19-Feb	Membrane structure & Transport of molecules	11 12	Salah	Assignment 5, Sunday 2/25
7	26-Feb	Intracellular compartments and protein sorting Compartmentalization	12 15	Salah	Assignment 6, Sunday 3/3
8	04-March	Energy Conversion & Metabolism	13 14	Salah	Midterm, Friday, 3/8
11- March			Spring Break		
9	18- March	Cell Motility and Cytoskeleton	17	Arjun	Assignment 7, Sunday 3/24
10	25- March	Cell division & cell cycle	18	Arjun	Assignment 8, Sunday, 3/31
11	01- April	Cell death	readings on Canvas	Arjun	Assignment 9, Sunday, 4/7
12	8 - April	Cell signaling	16	Arjun	Assignment 10, Sunday 4/14
13	15 - April	Development	20	Arjun	Assignment 11, Sunday 4/21
14	22- April	Integrative topics	20	Arjun	Assignment 12, Sunday 4/28
15	29-April	In class exercises	Arjun		None is due
16	06 - May	Final week	Arjun		*Final, Tuesday May 7 th (4:10-6:10 pm), same room

*Please check the announcement before the final exam, time and date might change.

Wish you all a successful academic year!

Teaching team