



BIO 332 CELL BIOLOGY

SPRING 2023

Dear Students,

We are all deeply saddened by the devastating situation in our country. We send our condolences for the lost ones and we wish patience and strength to all our students, their families, and loved ones. We will work together to overcome our grief, become stronger and build a better future.

We may have to revise the course plan according to the reassessment to be made country-wide, regarding higher education, at the beginning of April. The content to be delivered is certain but the method of course delivery, the number and dates of exams, and some other details are subject to change.

Course Description and Objectives

This course is an introduction to fundamental cellular structures and processes at molecular and systems levels. Topics include: structural organization of cellular components and properties of cell membranes; universality of fundamental cellular mechanisms; compartmentalization and division of labor within cells; mechanisms of cell-environment and cell-cell communication, regulation of cell growth, division and death, cancer and stem cells. Upon completing this course students will be able to identify basic molecular components of cellular structures, analyze molecular mechanisms involved in regulation of processes such as protein sorting, signaling, cell cycle and be able to predict possible outcomes under conditions that disrupt normal function.

Course Book

Molecular Biology of the Cell

Alberts, B., Heald, R., Johnson, A., Morgan, D., Raff, M., Roberts, K. and Walter, P.

W.W. Norton & Company (2022). ISBN: 9780393884821 (hardcopy), ISBN: 9780393884630 (epub)

Additional reading

-Essential Cell Biology

Johnson, A., Alberts, B., Morgan, D., Hopkin, K., Roberts, K., Raff, M. and Walter, P.

W.W. Norton & Company. ISBN: 9780393680362 (hardcover), ISBN: 9780393691092 (epub)

-Physical Biology of the Cell

Phillips, R., Kondev, J., Theriot, J. and Garcia, H. G. (2013)

Garland Science ISBN 978-0-8153-4450-6.

Course Instructors and Office Hours

Zehra Sayers

E-mail: zehra@sabanciuniv.edu

Office hour: Thursdays, 09:45-10:30 (email)

Office: FENS 2087

Please contact the instructor for the office hour. It may be online or in person depending on your needs.

Süphan Bakkal:

E-mail:suphan.bakkal@sabanciuniv.edu

Office Hour: Thursdays, 11:40-12:30 (email)

Office: UC 1083/1089

Please contact the instructor for the office hour. It may be online or in person depending on your needs.

Teaching Assistants (TAs)**Iskalen Cansu Okan**

E-mail:ctopcu@sabanciuniv.edu

Office:FENS 2100

Mehri Ahmadian

E-mail:mehriahmadian@sabanciuniv.edu

Office:FENS 2100

Gökçe Uyanık

E-mail:gokceuyanik@sabanciuniv.edu

Office:FENS 2100

You may communicate with your TAs via email if you have any questions regarding labs and experiments.

Lecture Schedule:

Wednesday, 9:40-11:30 in FENS L047

Thursday, 3:40-4:30 in FENS L047

We will be delivering the lectures online from the classrooms.

Please use the zoom link below to join lectures.

Wednesday, 9:40-11:30 [Zoom link: <https://sabanciuniv.zoom.us/j/92417340638>]

Thursday, 3:40-4:30 [Zoom link:<https://sabanciuniv.zoom.us/j/97403745127>]

Laboratory Schedule:

Section A: Wednesday, 11:40-2:30 in FENS 2053

Section B: Wednesday, 2:40-5:30 in FENS 2053

Course Schedule:

	Lecture Topics and Readings	Laboratory
Week 1 March 1-2	Cells and Genomes Chapters 1, 8, 9	No lab session
Week 2 March 8-9	Membranes: structure, transport and electrical properties Chapters 10, 11	No lab session
Week 3 March 15-16	Membranes: structure, transport and electrical properties Chapters 10, 11	No lab session
Week 4 March 22-23	Intracellular Compartments and protein traffic Chapter 12	No lab session

Week 5 March 29-30	Membrane traffic and vesicular transport Chapter 13	No lab session
<p>Week 4</p> <p>Midterm Exam 1</p> <p>Topics covered: Cells/genomes, Methods, Membranes, Intracellular compartments. [Chapters 1, 8, 9, 10, 11, 12]</p> <p>Date/Time: April 1, 2023 ONLINE EXAM</p>		
Week6 April 5-6	Membrane traffic and vesicular transport Chapter 13	Introduction to laboratory practices, lab safety, and writing lab reports.
Week 7 April 12-13	Cell communication and signaling Chapter 15	Introduction to microscopy
Week 8 April 19*	Cell communication and signaling Chapter 15	Separation of major cellular components
Week 9 April 26-27	Cytoskeleton Chapter 16	Setting up a mammalian cell culture
Week 10 May 3-4	Cytoskeleton Chapter 16	Transfection of cells
Week 11 May 10-11	Cell Cycle Chapter 11	Gene Expression Analysis-Part I
<p>Week 11</p> <p>Midterm Exam 2</p> <p>Topics covered: Vesicular transport, Signaling, Cytoskeleton [Chapters 13, 15, 16, 17]</p> <p>Date/Time: May 8, Monday [ONLINE EXAM]</p>		
Week 12 May 17-18	Apoptosis and Cancer Chapters 18,20	Gene Expression Analysis-Part II
Week 13 May 24-15	Cell junctions and extracellular matrix Chapter 19	Analysis of Cell Movement using Image J Program
Week 14 May 31*	Stem cells and tissue renewal Chapter 22	Flow Cytometry Analysis Lab: Analysis of Transfected Cells with Reporter Vectors
<p>Final Exam</p> <p>Topics covered: Cell cycle, Cancer, Apoptosis, Cellular junctions, and Extracellular Matrix, Stem Cells and Renewal [Chapters 11, 18, 19, 20, 22]</p> <p>Date/Time will be scheduled by Student Resources</p> <p>Note that the final exam will be in person and will be held on campus.</p>		

*There will be no lecture on Thursday (April 20 and June 1)

Make-up Policy for the exams:

You must take all exams in order to pass this course. If you miss an exam without a valid excuse (health-related reasons, death of a family member, accident), you will get zero from that exam. For health-related reasons, you must provide a health report either from the campus Health Center or from a doctor outside the campus. The report obtained outside the campus must be approved by a doctor at the Health Center on campus. Please check the [medical report](#) guideline issued by the Health Center. Make-up for each exam will be given at the earliest possible date after the exam.

Laboratory: Students will use basic laboratory techniques to learn about scientific methods for studying cellular and molecular mechanisms.

Upon completing the laboratory sessions, students will be able to

- (i) explain the reasoning behind the cell and molecular techniques studied in laboratory sessions
- (ii) report the experimental data as graphs, charts, tables, and figures based on the collected data
- (iii) analyze and interpret the experimental data
- (iv) present their findings and conclusions in a written lab report using their own words in a concise and logical manner.

Laboratory Rules:

- Attendance to all lab sessions and submitting of lab reports are MANDATORY.
- There is no make-up for missed labs.
- Students must attend the lab section they have registered.
- Students may miss no more than two labs due to health-related issues. If you have missed a lab, you are required to provide a health report either from the campus Health Center or from a doctor outside the campus. The report obtained outside the campus must be approved by a doctor at the Health Center on campus. Please check the [medical report](#) guideline issued by the Health Center.
- Students who miss more than two lab sessions (with or without health reports) will get zero from the lab component of the course.
- There will be unannounced lab quizzes throughout the semester before the lab session begins. The quiz questions are 2-3 questions to measure your knowledge about that day's experiment. Duration of quizzes will be 10 minutes at maximum.
- **Before coming to the lab [Pre-lab]**

Students are expected to

- read the section of the lab book corresponding to that week's experiment and watch the pre-lab video (if there is any)
 - write introduction, materials, and method parts in their lab notebooks. Students must bring their lab notebooks to every lab.
 - finalize their lab report after the lab session and submit their lab reports timely.
- **Lab report** of the previous week must be submitted on **Wednesdays during the next lab session**. 5 points per day will be reduced for late submissions. If the lab report is not submitted by the next lab session, the student will be counted as not attended to that lab session.
 - Each lab report is worth 100 points. 10 points are given for the pre-lab part of the lab report..

How to get lab notebooks?

Your TAs will inform you about how to get lab notebooks and lab coats at the introductory session.

Grading:

There will be two midterm exams and one final exam. You may see the schedule of the midterm exams and the topics (related chapters) covered under the Course Schedule part of the syllabus. Final exam date/time will be announced by Student Resources.

Midterm 1	20 %
Midterm 2	10%
Final Exam	40%
Lab	30% (10% quiz and 20% Lab notebook)

Letter Grade Policy:

A	100-90
A-	89-85
B+	84-80
B	79-75
B-	74-70
C+	69-65
C	64-60
C-	59-55
D+	54-50
D	49-45
F	44-0

- Above scale will be used as a reference while assigning letter grades.
- Note that letter grade boundaries may be adjusted according to the class average at the end of the semester.

How to calculate your overall grade?

Overall Grade= (Midterm 1x0.2)+(Midterm 2x0.2)+(Final Exam x0.3)+[Lab reports]*0.2+[Lab quizzes]x0.1

NA policy:

- If you miss one exam without an excuse, you will fail the course with F.
- If you miss one exam and not attend 50% or more of the lab sessions, you will fail the course with NA.

Academic Integrity Policy:

You will be working in groups in lab sections. Collaboration within and between group members is acceptable while performing experiments, collecting and analyzing data etc. This is a natural process in research. However, when writing lab reports, you must use your own words and provide citations for the referenced information. Copying another student's lab report, copying information from the lab book, using internet/book resources without providing citation, and submitting identical lab reports are not unacceptable. Such behavior is considered as a violation of academic integrity and will not be tolerated.

Violation of Academic Integrity Principle will result in zero grade for lab reports, quizzes, and exams for all parties involved. In addition, the involved students will receive a warning, and no matter how minor, plagiarism and cheating will result in immediate disciplinary action that may result in failing the course.

We believe that you (as students and future colleagues) will maintain academic integrity and mutual trust among your friends, teaching assistants, and instructors.

For the **University's Academic Integrity Statement**, see:
<http://www.sabanciuniv.edu/en/academic-integrity-statement>