



BIO 332 CELL BIOLOGY

SPRING 2024

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

Özgür Kütük

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Office hour: TBA

Office: FENSG052

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

Süphan Bakkal:

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Office Hour: TBA

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

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Annissa Rachel Vanwieren

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Office:TBA

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

Lecture Schedule:

Wednesday, 8:40-10:30 in FENS L047

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

Laboratory Schedule:

Wednesday, 12:40-3:30 in FENS G049

Course Schedule:

Please note that the schedule of the laboratory sessions may be subjected to change. Some of the “No lab” sessions may be used as additional lecture hours.

	Lecture Topics and Readings	Laboratory
Week 0 Feb 15-16	No lectures	No lab session
Week 1 Feb 19-23	Cells and Genomes	Lecture continues during the lab hours in FENS L047
Week 2 Feb 26-Mar 1	Membranes: structure, transport and electrical properties	Introduction to laboratory practices, lab safety, and writing lab reports.
Week 3 Mar 4-8	Membranes: structure, transport and electrical properties	Introduction to microscopy

Week 4 Mar 11-15	Intracellular Compartments and protein traffic	Microscopy-Tissues slides
Week 5 March 18-22	Membrane traffic and vesicular transport	Separation of major cellular components
<p>Week 6 Midterm Exam 1 Topics covered: Cells/genomes, Methods, Membranes, Intracellular compartments. March 27, 2024</p>		
Week6 Mar 25-29	Membrane traffic and vesicular transport	Midterm Exam
Week 7 Apr 1-5	Cell communication and signaling	Fluorescence Microscopy: Mitochondria
Apr 8-12 Semester Break		
Week 8 Apr 15-19	Cell communication and signaling	Fluorescence Microscopy:ER
Week 9 Apr 22-26	Cytoskeleton	Fluorescence Microscopy: Lysosome
Week 10 Apr 29-May 3	Cytoskeleton No lecture on May 1 (Wednesday)	No Lab
Week 11 May 6-10	Cell Cycle	Midterm Exam
<p>Week 11 Midterm Exam 2 Topics covered: Vesicular transport, Signaling, Cytoskeleton May 8, 2024</p>		
Week 12 May 13-17	Apoptosis and Cancer	Mammalian Cell Culture
Week 13 May 20-24	Cell junctions and extracellular matrix	Transfection

Week 14 May 27-29	Stem cells and tissue renewal	TBA
Final Exam Topics covered: Cell cycle, Cancer, Apoptosis, Cellular junctions, and Extracellular Matrix, Stem Cells and Renewal Date/Time will be scheduled by the Student Resources		

*There will be no lecture on Wednesday, May 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 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	20%
Final Exam	30%
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>