

Alanya Alaaddin Keykubat University | Rafet Kayış Faculty of Engineering
Genetic and Bioengineering Department
2026-2027 Fall Semester

Syllabus

Code/Name	GBM 203L / Cell Biology Lab
Type	Required
Credit/ECTS	2/2
Hour per Week	2 (0+2)
Level/Year	Undergraduate/2
Semester	Fall
Classroom	Chemistry Lab
Content	This course introduces the principles and applications of cell biology in a laboratory setting. Students will explore fundamental microscopy methods, membrane dynamics, cell counting, and basic fractionation techniques to understand cellular structures and processes through hands-on experiments.

Prerequisites

Textbooks	Primary Laboratory textbook prepared by the faculty members of our department Secondary Research articles published in such library as PUBMED, ELSEVIER
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Objectives	By the end of this course, students will be able to: • Explain fundamental concepts of cell biology through practical experiments. • Demonstrate proficiency in using light microscopes, hemocytometers, and basic laboratory equipment. • Analyze cellular processes such as cell viability, osmosis, the cell cycle, and organelle dynamics. • Interpret experimental data and correlate them with cellular mechanisms in bioengineering. • Report laboratory results effectively using professional scientific communication.
Course Outcomes	C01 Explain the importance and application areas of basic laboratory techniques used in cell biology experiments. C02 Identify and apply appropriate microscopy and staining methods for the cellular analysis of biological materials. C03 Test cell viability, membrane permeability, and intracellular organelle dynamics using basic laboratory tools. C04 Select and justify appropriate experimental approaches to analyze a biological problem at the cellular level. C05 Synthesize and present experimental cell biology data in a scientific report format.

Weekly Schedule of Topics

W	Topic
1	Lab safety: Introducing to lab equipment
2	Bacterial cell culture
3	Bacterial cell counting

4	Cell staining
5	Cell Division: Observing Mitosis in Onion Root Tips
6	Cell Viability Tests and counting with hemocytometer
7	Midterm Exam Week
8	Effects of Environmental Stress Factors (Salt, pH, Heat) on Cell Morphology
9	Specific Organelle Staining: Cytochemical examination of organelles
10	Basic Cell Fractionation: Chloroplast isolation by differential centrifugation
11	Mammalian Cell Culture and Aseptic Conditions
12	Cell Membrane Dynamics: Analysis of membrane permeability and hemolysis
13	Effects of Environmental Stress Factors (Salt, pH, Heat) on Cell Morphology
14	End of Semester Evaluation of Student Laboratory Skills

Professional Contribution	This course enhances students' professional competence by developing foundational laboratory skills in microscopy, cellular analysis, problem-solving, and the practical execution of fundamental cell biology experiments.
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Contribution to Program Outcomes*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	5	0	0	0	0	0	0	0	3	0	0
CO2	5	3	0	5	0	0	0	0	3	0	0
CO3	4	0	0	5	0	0	0	0	3	0	5
CO4	4	5	0	5	0	0	0	5	5	0	0
CO5	5	5	0	5	5	0	3	5	5	0	5

* Contribution Level | 0: None | 1: Very Low | 2: Low | 3: Medium | 4: High | 5: Very High

Special Conditions	Students work in groups in lab stations.										
Requirements	Basic knowledge of biology and cell biology										
Course Policy	• Communication should be in English at all times. • Minimum 80% attendance required; otherwise, a grade of DZ will be assigned. • Attendance is mandatory for all lab sessions; absence results in no grade in quizzes and reports of the corresponding week. • Students should prepare by reading lab notes and assigned articles prior to the lab session each week.										
Cheating & Plagiarism	• Copying or allowing others to copy during exams, assignments, or reports is cheating. • Using uncredited content from others, electronic sources or AI tools constitutes plagiarism. • Any academic dishonesty results in a grade of FF for the course.										
Evaluation	<table> <tr><td>Laboratory Reports</td><td>20%</td></tr> <tr><td>Quiz</td><td>10%</td></tr> <tr><td>Midterm</td><td>30%</td></tr> <tr><td>Final Exam</td><td>40%</td></tr> <tr><td>Total</td><td>100%</td></tr> </table>	Laboratory Reports	20%	Quiz	10%	Midterm	30%	Final Exam	40%	Total	100%
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Quiz	10%										
Midterm	30%										
Final Exam	40%										
Total	100%										
Rubric	The rubric will be provided during the first week.										

Instructor

Name/Surname	Senem UYLAŞ	Email	senem.uylas@alanya.edu.tr
Room	329	Office Hours	Thursday 11:00-13:20

Prepared by Senem UYLAŞ on September 28th, 2026.