

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

Syllabus

Code/Name	GBE 107 GBE Lab I
Type	Required
Credit/ECTS	2/2
Hour per Week	2 (0+0+2)
Level/Year	Undergraduate/1
Semester	Fall
Classroom	EL-Z-4 (MUHL-016 Chemistry Lab)
Content	This laboratory course introduces fundamental biological laboratory principles and techniques through hands-on experimentation, complementing GBE 101 Biology I. It covers essential laboratory skills, including biosafety, equipment handling, microscopy, solution and media preparation, biochemical detection of macromolecules, cellular and histological observation, and quantitative physiological assays. Students will learn to analyze experimental data, plot results, and communicate findings in formal laboratory reports.
Prerequisites	---
Textbooks	<i>Primary</i> GBE 107 Laboratory Handouts
Objectives	• Operate instruments to conduct biological experiments and apply standard biosafety procedures. • Perform qualitative and quantitative biochemical assays, media preparation, and biological sample analyses. • Utilize light microscopy and differential staining techniques for cellular and tissue structural observation. • Analyze and interpret biological experimental data effectively and communicate findings through laboratory reports.
Course Outcomes	Upon successful completion of this course, students will be able to: C01: Demonstrate proper biological laboratory safety practices and proficiency in operating standard laboratory equipment. C02: Prepare culture media and execute qualitative/quantitative biochemical tests to analyze macromolecules and antioxidant capacity in biological samples. C03: Apply light microscopy and differential staining techniques to identify, characterize, and analyze cellular organelles, tissues, and cell division stages. C04: Perform physiological and biological assays involving pH measurement, osmotic dynamics, spectrophotometric pigment quantification, and protein analysis. C05: Collect, evaluate, and present experimental data through structured laboratory reports and review relevant scientific literature.

W Topic

- 1 Lab Safety, introduction to lab equipment.
- 2 Preparation and Sterilization of Bacterial Medium (LB Broth and LB Agar).
- 3 Determination of glucose, starch, fat, and protein in food samples.
- 4 Microscopy.
- 5 Parts of the Cell.
- 6 Determining the Effectiveness of an Antacid Using a pH Meter.

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- 7 Observation of Chloroplast Dynamics and Osmotic Processes in Plant Cells.
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- 8 Quantification of Chlorophyll Pigment in Leaf.
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- 9 Quantification of Tear protein concentration.
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- 10 Observation of polyembryonic and monoembryonic plant seed.
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- 11 Onion root tip observation.
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- 12 Differential Staining of Plant Tissues with Malachite Green and Safranin, and observing xylem/phloem, and stroma
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- 13 Antioxidant activity
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- 14 General review
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Professional Contribution To classify the kingdom of living things in the general biology laboratory, to get to know them closely and to have knowledge.

Contribution to Program Outcomes*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
C01	2	-	-	-	3	-	2	3	2	-	3
C02	2	-	-	-	3	-	2	3	2	-	3
C03	2	-	-	-	3	-	2	3	2	-	3
C04	2	-	-	-	3	-	2	3	2	-	3
C05	2	-	-	-	3	-	2	3	2	-	3
C06	2	-	-	-	3	-	2	3	2	-	3

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

Special Conditions

- Students work in groups.
- Experimental studies are reported using MS Word or PDF format

Requirements

Course Policy

- Students must arrive in the class or laboratory on time.
- Both students and the lecturer must communicate in English.
- Students should prepare by reading lab notes and assigned articles prior to the lab session each week.
- At least 80% attendance is required; otherwise, a grade of DZ will be assigned.

Cheating & Plagiarism

- Copying or letting someone copy anyone's work on exams, assignments, or reports is cheating.
- Cutting and pasting text, figures, and tables from web sources, ChatGPT, or any other electronic source is plagiarism.
- The consequence of academic dishonesty is to receive a grade of FF for the course.

Evaluation

Quiz + Lab Report	10 + 20%
Midterm	30%
Final Exam	40%
Total	100%

Rubric The evaluation rubric for laboratory reports is available on the Department's official website.

Instructor

Name/Surname	Hüseyin GÜL	Email	huseyin.gul@alanya.edu.tr
Room 210	Office Hours	W Monday-Thursday	T 10.30-12.30

Prepared by Hüseyin GÜL on October 1st, 2026.