## SAlanya Alaaddin Keykubat University | Rafet Kayış Faculty of Engineering Genetics and Bioengineering Department 2024-2025 Fall Semester

Syllabus	
Code/Name	GBM 305L / GENETIC ENGINEERING I LAB
Туре	Required
Credit/ECTS	2/2
Hour per Week	4 (0+4)
Level/Year	Undergraduate/3
Semester	Fall
Classroom	FFF   L114
Content	Introduction of genetic engineering laboratory content, chemical solution preparation, medium preparation and laboratory sterilization, transformation application, PCR application, DNA isolation, Primer-Probe design and Quantitative PCR application
Prerequisites	
Textbooks	Primary
	Laboratory textbook prepared by the faculty members of our department <b>Supplementary</b> Research article published in such library as PUBMED, ELSEVIER
Objectives	<ul> <li>To apply genetic engineering laboratory techniques and follow lab rules.</li> <li>To calculate and prepare chemical solutions using correct mathematical methods.</li> <li>To demonstrate medium preparation and sterilization techniques.</li> <li>To conduct transformation processes in detail.</li> <li>To execute PCR applications.</li> <li>To design primers and probes and perform Quantitative PCR.</li> </ul>
Course Outcomes	In this course you will be able to: CO1. Operate and manage a genetic engineering laboratory following established procedures. CO2. Prepare and calculate chemical solutions accurately in the laboratory. CO3. Perform and evaluate media preparation and sterilization under laboratory conditions. CO4. Conduct and analyze experiments related to DNA isolation, PCR, and Quantitative PCR applications. CO5. Identify and address problems that may occur during laboratory experiments

## Weekly Schedule of Topics

W	Topic	Laboratory   Experiments   Discussions
1		Introduction, Organizing study groups, General Information
2		Solution Preparation
3		Medium preparation, sterilization
4		E. coli plasmid DNA isolation
5		Genomic DNA isolation ( <i>E. coli</i> )
6		Genomic DNA isolation (Plant)
7		Genomic DNA isolation (Blood)
8		Determination of DNA concentration

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9	Restriction Endonuclease Digestion Reaction and Agarose gel
10	E. coli competent cell preparation and transformation
11	Colony PCR (Polymerase Chain Reaction)
12	Visualization of PCR products on agarose gel
13	Quantitative PCR (qPCR)
14	General review lesson

Professional<br/>ContributionComprehending the techniques used in genetic engineering

## **Contribution to Program Outcomes\***

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011
C01	0	0	0	0	5	4	2	0	0	0	0
CO2	3	4	0	3	5	5	5	0	2	0	0
CO3	3	3	0	4	5	4	5	4	3	0	0
C04	2	3	0	4	5	5	5	4	3	0	0
C05	3	3	0	3	5	3	4	3	5	0	0

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

<b>Special Conditions</b>	• Students work in groups.						
	<ul> <li>Experimental studies are reported using MS Word or PDF format</li> </ul>						
Requirements							
<b>Course Policy</b>	• Students must arrive in the class or laboratory on time.						
	<ul> <li>Both students and the lecturer must communicate in English.</li> </ul>						
	<ul> <li>Students should prepare by reading lab notes and assigned articles prior to the lab session each week.</li> </ul>						
	• At least 80% attendance is required; otherwise, a grade of DZ will be assigned.						
Cheating & Plagiarism	• Copying or letting someone copy anyone 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 <b>FF</b> for the course.						
Evaluation	The evaluation breakdown is as follows:						
	Laboratory Reports (14 pieces) - 30%						
	Throughout the course, students are required to submit a laboratory report each week, totaling 14 reports over the duration of the semester.						
	Midterm Exam – 20%						
	Final Exam – 50%						
Rubric	For each report, a rubric will be provided during the first week. The rubric has four main						
	sections for grading: aim of the study, materials & methods, results, and discussion.						
Instructor							
N /C							

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Room	310	Office Hours	Monday 10:30-12:30 and Tuesday 10:30-12:30

Prepared by Özlem KAPLAN.