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

Syllabus	
Code/Name	GBM305 / GENETIC ENGINEERING I
Type	Required
Credit/ECTS	6/6
Hour per Week	3
Level/Year	Undergraduate/3
Semester	Fall
Classroom	MUHD-307
Content	GBM305 Genetics covers the steps, methods, and applications of gene cloning comprehensively.
Prerequisites	N/A
Textbooks	***Primary*** Gene Cloning and DNA Analysis, 8th Edition, Brown, 2020 ***Supplementary*** An Introduction to Genetic Engineering, 4th Edition, Nicholl, 2023
Objectives	● To introduce students to fundamental concepts of gene cloning To analyze and conduct experimental data. ● To develop student's ability to design gene cloning experiment. ● To develop student's practical academic skills through various assignments.
Course Outcomes	CO1. Summarize key concepts of gene cloning and gene analysis. CO2. Design of whole gene cloning experiment . CO3. Analysis of experimental results obtained by each step of gene cloning. CO4. Perform basic genetic-related database searches and gather relevant data. CO5. Demonstrate the ability to critically assess academic readings in genetic engineering. CO6. Create basic scientific illustrations digitally, accurately representing genetic processes. C07. Work both independently and collaboratively to complete tasks and solve problems.

Weekly Schedule of Topics

W	Topic	Content
1	Introduction to Course	Introducing the lecturer, course structure, syllabus evaluation method, rules and expectations
2	Genetic Engineering	Overview of gene cloning and PCR, recent news about genetic engineering
3	Vectors	Introduction to cloning vectors, plasmids, λ and M13 bacteriophages
4	DNA Purification	Bacterial growth, cell lysis, various method to purify DNA
5	DNA Manipulation	Various methods involving DNA manipulation, DNA restriction and DNA ligation
6	DNA Introduction	Techniques to introduce recombinant DNA into host cell, selection of host cell.
7	Cloning Vectors I	Prokaryotic cloning vectors in detail
8	Cloning Vectors II	Eukaryotic cloning vectors in detail

9	Selection of Clones	Problems in selection, gene libraries, clone identification, hybridization
10	Polymerase Chain Reaction	Detailed conventional PCR and specialized PCRs and their various applications
11	Gene Sequencing	Conventional, next-generation and genome sequencing techniques
12	Gene Expression and Function	Transcript analysis techniques, regulation of gene expression analysis, identification of translation product
13	Genomes	Locating genes in genome, determining function of an unknown gene, genome browsers
14	Transcriptome and Proteome	Studying transcriptome, studying proteome

Professional Contribution	N/A

Contribution to Program Outcomes*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	1	1	1	1	2	2	0	0	0	0	0
CO2	1	2	3	2	0	0	0	0	0	0	0
CO3	1	2	1	1	0	0	0	0	0	0	0
CO4	1	1	0	1	1	0	0	0	0	0	0
CO5	1	1	1	1	1	1	0	0	0	0	2
CO6	0	0	0	0	0	0	2	0	2	0	1
CO7	0	0	0	0	0	0	3	3	1	0	1

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

Special Conditions	N/A
Requirements	N/A
Course Policy	N/A

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, AI or any other electronic source is plagiarism.
- The consequence of academic dishonesty is to receive a grade of **FF** for the course.

Evaluation		
	Assignments (10x)	30%
	Midterm Exam	30%
	Final exam	40%
	Total	100%

Rubric **N/A**

Instructor

Name/Surname	Enes Durgut	Email	**enes.durgut@alanya.edu.tr**
Room	321	Office Hours	Students can arrange meetings through Google Calendar

Prepared by Enes Durgut on October 16th, 2024