Alanya Alaaddin Keykubat University | Rafet Kayış Faculty of Engineering
Genetic and Bioengineering Department
2023-2024 Spring Semester

Syllabus	
Code/Name	GBM 302L / GENETIC ENGINEERING II LAB
Type	Required
Credit/ECTS	3/3
Hour per Week	4
Level/Year	Undergraduate/3
Semester	Spring
Classroom	FFF | L114
Content	This is a course that explains the systems related to the transfer of theoretical knowledge learned in other Genetics and Bioengineering courses into practice. In this context, the necessary materials and processes in laboratory applications will be explained, and students will be able to both design and implement them. The basic plasmid, transfection methodology, cell culture techniques, RNA expression, cell lysis techniques and Western blot study in genetic engineering applications, as well as conventional and modern genetic modification techniques will be explained in detail and with their applications. This course includes basic applications so that students can transfer modern applications of basic experimental design and genetic engineering applications from both academic and industrial perspectives.
Prerequisites	GBM 305L GENETIC ENGINEERING I LAB, GBM 305 GENETIC ENGINEERING I
Textbooks	***Primary*** Laboratory textbook prepared by the faculty members of our department ***Supplementary*** • Kurnaz, Isil Aksan. Techniques in Genetic Engineering. 1st ed. CRC Press, 2015. Web. 25 Sept. 2021. ISBN 9780367658816 • Research article published in such library as PUBMED, ELSEVIER
Objectives	• To teach both the theoretical background and laboratory application principles of the techniques necessary for the processing, modification and artificial transfer of genetic information from cell to cell • To analyze and conduct experimental data • To prepare weekly laboratory report with Genetic and Bioengineering approaches
Course Outcomes	In this course students should be able to: CO1. To know laboratory safety rules in Genetic engineering laboratory applications. CO2. To conduct various experiments as cell culture application, transfection, agarose gels, SDS-PAGE gels, cell lysis and protein isolation/amount determination, Western blot studies. CO3. To analyze experimental data, interpret and report experimental results. CO4. To justify the accuracy of experimental results by evaluating them through literature review.

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Weekly Schedule of Topics

W	Topic	Laboratory | Experiments | Discussions
1		Introduction, organizing study groups, General Information
2		Chemical solution preparation techniques
3		Introduction to Cell Culture Techniques
4		Gene modification (transfection)
5		Visualization of PCR products on agarose gel
6		Protein isolation types and determination of protein amount
7		SDS-PAGE, Western blotting (Only course)
8		SDS-PAGE, (Lab)
9		Western blotting (Lab)
10		Western blotting (Lab)
11		Western blotting (Lab)
12		Group Presentation
13		Group Presentation
14		General review

Professional Contribution	Be able to conduct experiment with analyzing data and comparing the results obtained from experiment with literature, and to write weekly report with group member

Contribution to Program Outcomes*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	0	0	0	0	5	4	2	0	0	0	0
CO2	3	4	0	3	5	5	3	2	2	0	0
CO3	3	3	0	4	5	4	4	3	3	0	0
CO4	2	3	0	4	5	5	5	4	5	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 should be in the class or laboratory on time. • Both student and responsible lecturer should communicate in English • Students should prepare themselves by reading lab notes and articles sent. • Students should be prepared by reading the assigned articles and lab notes on a weekly basis. • At least **80%** attendance is required, otherwise a grade of **DZ** will be assigned. • Students must be present in class for the presentations, otherwise students will not be graded for the presentation.
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 **FF** for the course.	
Evaluation	Laboratory (7×10 pts.) Midterm Exam Presentation homework Final exam Total	8% 32% 20% 40% 100%
Rubric	For each report, a rubric will be announced at first week. The rubric has 4 main parts for the grading: aim of the study, material&methods, results and discussion parts	

Instructor

Name/Surname	Sinem Yılmaz	Email	**sinem.yilmaz@alanya.edu.tr**
Room	210	Office Hours	Thursday 10:30-12:30 and 13:30-15:00

Prepared by Sinem Yılmaz on June 4th, 2024