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

Syllabus

Code/Name	SEC402.3 / Gene Therapy
Type	Elective
Credit/ECTS	5/5
Hour per Week	3 (3+0+0)
Level/Year	Undergraduate/4
Semester	Spring
Classroom	D305
Content	In this course, students will cover the following key topics: Understanding the mechanisms and methods of gene modification. Gene Therapy Approaches: Investigation of gene delivery methods, therapeutic gene design and *in vivo* applications. Genome Editing Technologies: In-depth review of CRISPR-Cas9 and other genome editing techniques. viral and non-viral gene transfer techniques Ethical and Regulatory Aspects: Discussion of ethical considerations, regulatory frameworks, and safety protocols in gene therapy. Case Studies and Clinical Applications: Analyzing real-world examples of gene therapy success stories and challenges,
Prerequisites	Genetic engineering
Textbooks	***Primary*** "Gene Therapy" by Mauro Giacca "Genome Editing: The Revolution in Gene Editing and the Creation of a New World" by Nessa Carey ***Secondary*** Recent articles Website of American Society of Gene & Cell Therapy
Objectives	● To identify the importance of nanotechnology in bioengineering ● To recognize the design and characterization of nanomaterials ● To interpret biosensors and their applications
Course Outcomes	In this course you will be able to: CO1 Describe the principles and techniques of gene modification. CO2 Evaluate and apply various gene therapy approaches to specific genetic disorders. CO3 Demonstrate proficiency in genome editing technologies. CO4 Explain the ethical, legal, and regulatory issues in gene therapy. CO5 Analyze and discuss clinical applications and case studies in gene therapy.

Weekly Schedule of Topics

W	Topic
1	Introduction to gene therapy
2	Introduction to gene therapy
3	Last report of the American Society of Gene & Cell Therapy I
4	Last report of the American Society of Gene & Cell Therapy II
5	Tissue-directed gene delivery systems
6	Viral vectors
7	Viral vectors
8	Non-viral vectors
9	Non-viral vectors

10	Liposomal gene delivery system
11	Targeted gene delivery methods
12	Genome editing technologies
13	Case discussion
14	Safety and ethical issue of gene therapy

Professional Contribution	

Contribution to Program Outcomes*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	4	4	3	4	4	3	3	4	5	4	5
CO2	5	4	4	3	5	3	3	4	5	4	5
CO3	5	5	4	4	5	3	3	4	5	4	5
CO4	4	3	2	2	0	3	3	4	5	3	5
CO5	5	5	4	4	4	3	3	4	5	4	5

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

Special Conditions	-
Requirements	Genetic engineering
Course Policy	● Be in the class on time. ● English should always be used to communicate with one another. ● At least 70% attendance is required, otherwise, a grade of **DZ** will be assigned. ● You must be present in class for the presentations, otherwise you will not be graded.
Cheating & Plagiarism	● Copying or letting someone copy your work on exams, assignments, or reports is cheating. ● Cutting and pasting text, figures, and tables from web sources or any other electronic source is plagiarism. ● The consequence of academic dishonesty is to receive a grade of **FF** for the course.
Evaluation	Midterm 30% Project 20% Final Exam 50% Total 100%
Rubric	A rubric will be announced before the project sessions. The rubric has 2 main parts for the grading: technical assessment and writing or presentation performance.

Instructor

Name/Surname	Şurhan Göl	Email	surhan.gol@alanya.edu.tr
Room	3rd Floor	Office Hours	Wednesday 10:30-11:15

Prepared by Şurhan Göl on November 10th, 2024.