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

Syllabus

Code/Name	GBM402.5 / Stem Cell
Type	Elective course
Credit/ECTS	5/5
Hour per Week	3 (3+0+0)
Level/Year	Undergraduate/4
Semester	Spring
Classroom	D305
Content	The content of the course will include the scientific basis of stem cell biology. In this class we will discuss three topics: the recent findings on adult and embryonic stem cell classes and their niches, on epigenetic control of stem cells and stem cells in human disease.
Prerequisites	
Textbooks	***Primary*** J.M.W. Slack (2018). Science of Stem Cells. John Wiley & Sons, Inc. ***Supplementary***
Objectives	● To provide an in-depth understanding of the molecular mechanisms underlying the essential of stem cell biology. ● To provide students with the knowledge and training needed to approach and formulate scientific questions relevant to stem cell biology. ● To survey the frontiers of stem cell research and aims to make the students accustomed to the advanced methods applied in stem cell research.
Course Outcomes	In this course you will be able to: CO1 Explain the basics of stem cell biology, CO2 Describe the different types of stem cells, how they are derived and the extent of their plasticity, CO3 Be able to understand the basic principles in stem cell biology and development, CO4 Define the molecular mechanisms of stem cell differentiation, CO5 Discuss potential applications of stem cells in regenerative medicine.

Weekly Schedule of Topics

W	Topic
1	Introduction and Basic Concepts in Stem Cell, Stem Cell Research and Therapy
2	Embryonic and Pluripotent Stem Cells
3	Hematopoietic Stem Cells and Control of Hematopoiesis
4	Adult Stem Cells: Mesenchymal Stromal Cells, Endothelial Progenitor Cells, and Pericytes
5	Cancer Stem Cells and the Development of Cancer
6	Stem Cell Applications in Metabolic Disorders: Diabetes Mellitus
7	Midterm Exam
8	Exosomes in Stem Cell Biology
9	Isolation of Bone Marrow and Adipose-Derived Mesenchymal Stromal Cells
10	*In Vitro* Methods for Generating Induced Pluripotent Stem Cells

11	Tissue Engineering Modalities and Nanotechnology.
12	Scaffold Engineering Using the Amniotic Membrane
13	Application of the Scientific Method in Stem Cell Research I
14	Application of the Scientific Method in Stem Cell Research II

Professional Contribution	Understand the field of stem cells and its applications

Contribution to Program Outcomes*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	4	3	1	5	4	3	1	3	2	3	5
CO2	4	4	1	5	5	3	1	3	4	3	5
CO3	4	4	1	4	5	3	1	3	2	3	5
CO4	0	0	3	1	3	3	2	3	4	4	5
CO5	0	0	1	1	1	3	4	3	5	1	4

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

Special Conditions	
Requirements	
Course Policy	● Be in the class on time. ● English should be used to communicate with one another. ● Mobile phone should be switched off and put away during the class. ● At least 70% attendance is required, otherwise a grade of **DZ** will be assigned.
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 50% Final Exam 50% Total 100%
Rubric	A rubric will be announced prior to exams.

Instructor

Name/Surname	Aslı Giray	Email	asli.giray@alanya.edu.tr
Room		Office Hours	W 11.30-12.30 | T 13.30-14.30

Prepared by Aslı Giray.