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

Syllabus	
Code/Name	SEC 402.1 / Molecular Signaling Pathways and Cancer
Type	Elective
Credit/ECTS	5/5
Hour per Week	3 (3+0+0)
Level/Year	Undergraduate/4
Semester	Spring
Classroom	D305
Content	The course will describe different modes of cell signaling in response to developmental, environmental or pathological changes. The molecular mechanisms, including structural ones, from the perception of stimuli to the physiological response, will be approached through examples drawn from the most recent knowledge in the biology of prokaryotic and eukaryotic cells. it is planned to examine the signaling pathways effective in carcinogenesis, and the types of cancer treatment used today.
Prerequisites	---------
Textbooks	***Primary*** Lauren Pecorıno. (2005). Molecular Biology of Cancer: Mechanisms, Targets and Therapeutics. Oxford University Press. Margaret Knowles and Peter Selby. (2005). Introduction to the Cellular and Molecular Biology of Cancer. Oxford Bioscience ***Supplementary*** King R.J.B. (2000). Cancer Biology. Pearson Education Ltd,London
Objectives	• Within the scope of this course, it is planned to examine the basic concepts of cancer genetic, factors that cause cancer progression, • the hallmarks of cancer and process of carcinogenesis, • signaling pathways effective in carcinogenesis, and the types of cancer treatment used today.
Course Outcomes	In this course you will be able to: CO1 Define the basic concepts of cancer biology and genetic CO2 Explain the hallmarks of cancer cell CO3 Describe the carcinogenesis process CO4 Distinguish the oncogene and tumor suppressor gene, Define the cancer risk factors CO5 Explain the cancer related signaling pathways, Define the relationship between inflammation and cancer CO6 Classify the cancer treatment methods, Molecular biology techniques in cancer research

Weekly Schedule of Topics

W	Topic
1	Basic concepts of cancer genetic
2	Stages of tumorigenesis
3	Oncogenes
4	Tumor suppressor genes
5	Carcinogenic agents and DNA damage
6	Apoptosis and cell cycle

7	Signal transduction in cancer-Receptor tyrosine kinases (RTK)
8	Signal transduction in cancer-MAPK
9	Signal transduction in cancer-PI3K/AKT
10	Signal transduction in cancer-mTOR
11	Signal transduction in cancer-Wnt
12	Signal transduction in cancer-JAK/STAT
13	Inflammation and cancer-NFkB
14	Treatment methods in cancer

Professional Contribution	To have knowledge that will allow working in companies or research laboratories working on cancer biology, to be able to design research and projects on cancer biology.

Contribution to Program Outcomes*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	4	3	4	5	5	3	4	3	3	3	4
CO2	3	2	3	5	3	4	4	4	4	0	5
CO3	2	3	5	4	3	4	2	1	2	2	4
CO4	3	3	4	4	3	3	3	2	3	3	4
CO5	3	1	3	4	3	3	1	3	1	2	3
CO6	2	2	2	2	3	4	2	2	2	3	2

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

Special Conditions	• Students work in groups for project and presentations.
Requirements	Basic knowledge of Cell Biology, Cancer Biology and Molecular Cell Biology
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.
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	Mid-term Exam 30% Presentation 20% Final Exam 50% Total 100%
Rubric	----------

Instructor

Name/Surname	Ayşe Erdoğan	Email	ayse.erdogan@alanya.edu.tr
Room	330	Office Hours	W 13:30-15:30

Prepared by Dr. Ayşe Erdoğan-17.10.2024