UNIVERSITY of NICOSIA

Course Syllabus

Course Code	Course Title	ECTS Credits
BIOL-423	Cell Signaling	6
Prerequisites	**Department**	**Semester**
BIOL-321	Life and Health Sciences	Fall/Spring
Type of Course	**Field**	**Language of Instruction**
Elective	Biology, Medicine	English
Level of Course	**Lecturer(s)**	**Year of Study**
1st Cycle	Dr Kyriacos Felekkis	4th
Mode of Delivery	**Work Placement**	**Corequisites**
Face-to-face	N/A	None

Course Objectives:

The main objectives of the course are to:

- Introduce the terminology associated with cell signaling and communication.
- Explore the major cell signaling pathways
- Discuss the current literature and the cellular and molecular techniques used in understanding key advances in this area.

Learning Outcomes:

After completion of the course students are expected to be able to:

1. Name and describe central themes and mechanisms in cell signaling.
2. Identify and describe the major cell signaling pathways and their components.
3. Identify and describe the relationship between disease and components in cell signaling.
4. Identify and describe the principles of communicative and functional interactions between cell.
5. Critically analyze and interpret experimental findings from key research papers.
6. Evaluate the application of AI in research and analysis of cell signaling pathways.

Course Content:

1. Introduction to signal transduction.
2. Odor perception and G-protein coupled receptors.
3. Fight or flight: adrenalin and cAMP.
4. Growth hormones and JAK/STAT.
5. Tyrosine kinase receptors.
6. Phospoinositides in signaling, signaling modularity.
7. Cell growth and cell death/apoptosis signaling.
8. Insulin and diabetes.
9. MAP kinase signaling in yeasts.
10. Protein degradation in signaling.
11. Kinase function and regulation
12. Chemotaxis; Histidine kinases and two component signaling
13. Networks in signaling (patterning and hedgehog in Drosophilla)
14. AI in Cell Signaling: Computational Models and Predictive Analytics

Learning Activities and Teaching Methods:

Lectures, Discussions and interpretation of research papers, cooperative presentations on the relevance of signal transduction molecules and diseases.

Assessment Methods:

Assignments, Tests and Mid-term Exam; Final Exam

Required Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Molecular biology of the cell	Alberts, Bruce.	Garland Science	6th Edition, 2014	ISBN - 978-0815344643
Signal Transduction	M.Diederich	Blackwell Publishing	2007	ISBN-10: 1573316954

Pathways: Cell Signaling in Health and Disease: Pt. C (Ann. of the N.Y. York Acad. of Sci.)				
Cell Signalling	John Hancock	OUP Oxford;	4th Edition, 2017	ISBN- 978-0199658480

Recommended Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Cell Signaling: Principles and Mechanisms	Wendell Lim, Bruce Mayer, Tony Pawson	Garland Science	2014	ISBN-10: 1588298825