



Jordan University of Science and Technology
Faculty of Science & Arts
Applied Biological Sciences Department

BIO712 Advanced Cell Biology

First Semester 2024-2025

Course Catalog

3 Credit Hours. This course in Cancer Biology introduces students to the complex and multifaceted nature of cancer, a disease affecting one in two individuals during their lifetime. While the alarming prevalence of cancer is counterbalanced by the fact that many cancer deaths are preventable, the course emphasizes the importance of understanding both the genetic and epigenetic factors that contribute to tumorigenesis. Students will delve into the molecular and cellular mechanisms underlying cancer development, as well as the significant role of lifestyle choices in prevention. By integrating basic biological principles with clinical contexts, the course aims to provide a holistic view of cancer, fostering a deeper understanding of its impact on both individual lives and society.

Teaching Method: On Campus

Text Book

Title	Cancer Biology: How Science Works
Author(s)	Carsten Carlberg, Eunike Velleuer
Edition	1st Edition
Short Name	1
Other Information	2021

Course References

Short name	Book name	Author(s)	Edition	Other Information
2	Principles of cancer biology	Lewis J Kleinsmith	1st Edition	2014
3	Becker's World of the Cell (Global Edition)	Jeff Hardin, Gregory Bertoni, Lewis Kleinsmith	10th Edition	2022

Instructor

Name	Prof. Homa Darmani
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Office Location	PH1L1
Office Hours	
Email	darmani@just.edu.jo

Class Schedule & Room
Section 1: Lecture Time: Sun, Tue : 14:30 - 16:00 Room: SF05

Tentative List of Topics Covered		
Weeks	Topic	References
Weeks 1, 2	Introduction to Cancer	From 1, From 2
Weeks 3, 4	Oncogenes and Signal Transduction	From 1, From 3
Week 5	Tumor Suppressor Genes and Cell Fate Control	From 1, From 3
Weeks 6, 7	Multi-step Tumorigenesis and Genome Instability	From 1, From 2, From 3
Week 8	Cancer Genomics	From 1, From 2, From 3
Week 9	Cancer Epigenomics	From 1, From 2, From 3
Week 10	Aging and Cancer	From 1
Week 11	Tumor Microenvironment	From 1, From 2
Week 12	Metastasis and Cachexia	From 1, From 2
Week 13	Cancer Immunity	From 1, From 2
Weeks 14, 15	Architecture of Cancer Therapies	From 1, From 2

Mapping of Course Outcomes to Program Outcomes	Course Outcome Weight (Out of 100%)	Assessment method

In this course, students will gain a comprehensive understanding of cancer, beginning with its global burden and the various ways tumors are categorized and diagnosed. They will explore critical transitions in cancer development, investigate the underlying causes, and learn about prevention strategies. The course will also delve into the biology of cancer, including oncogenes and signal transduction pathways, as well as tumor suppressor genes and their role in cell fate control. Key topics will cover multi-step tumorigenesis, genome and epigenomic instability, the impact of aging on cancer, and the tumor microenvironment. [1A]	30%	
Extra topics of interest selected and presented during the class [1D]	30%	
Students will examine the mechanisms of metastasis and cachexia, gaining insight into the metastatic cascade and the epithelial-mesenchymal transition. Additionally, the course will address cancer immunity, including tumor antigen recognition and the latest advancements in immunotherapies. Finally, participants will explore the architecture of cancer therapies, comparing classical treatments to targeted and precision oncology approaches. Through this multidisciplinary perspective, students will develop a robust understanding of cancer biology and treatment strategies. [1A]	40%	

Relationship to Program Student Outcomes (Out of 100%)					
A	B	C	D	E	F
70			30		

Evaluation	
Assessment Tool	Weight
Midterm	30%
Assignments	30%
Final	40%

Date Printed: 2024-10-07