

## COURSE DESCRIPTIONS

<b>Faculty</b>	Pharmacy				
<b>Department</b>	Medical Laboratory Sciences			<b>NQF level</b>	5
<b>Course Title</b>	Oncology	<b>Code</b>	902464	<b>Prerequisite</b>	
<b>Credit Hours</b>	3	<b>Theory</b>	3	<b>Practical</b>	0
<b>Course Leader</b>	Dr. Mohammad Bani-Ahmad	<b>email</b>	<a href="mailto:m.baniahmad@jadara.edu.jo">m.baniahmad@jadara.edu.jo</a>		
<b>Lecturers</b>	Dr. Mohammad Bani-Ahmad	<b>emails</b>	<a href="mailto:m.baniahmad@jadara.edu.jo">m.baniahmad@jadara.edu.jo</a>		
<b>Lecture time</b>	Sun, Tue 19:30-21:00	<b>Classroom</b>	Online	<b>Attendance</b>	Fulltime
<b>Semester</b>	First 2022/2023	<b>Production</b>	2019	<b>Updated</b>	2022

## Short Description

This course will offer a broad overview of the biology and pathology of cancer. The first part of the course will emphasize on the genetic and molecular basis of cancer. We will explore the role of mutations in cancer cells and how they lead to the deregulation of crucial biological properties such as programmed cell death, cell proliferation, and differentiation. The second half of the course will focus on the interface of cancer and medicine. Conventional chemotherapy and Immunotherapies will be discussed. The ever-expanding role of genomics and bioinformatics in areas such as tumor classification, prognosis, and treatment will also be discussed.

## Course Objectives

Upon completion of this course, the student will be able to:

1. What are the common cellular and molecular mechanisms that are deregulated in cancerous cells, and how does their deregulation contribute to the development of cancer?
2. What role does gene mutation play in the development of cancer?
3. In what ways do environmental factors influence cancer susceptibility and how may we use this information to prevent cancer?
4. How does cancer manifest itself in the human body? What features of cancer lead to high mortality rates?
5. What is the biological rationale for both traditional chemotherapies and Immunotherapies approaches? What are the benefits and limitations of each option?
6. In what ways can genomic technologies provide insight into cancer prevention, diagnosis, and treatment? What are the limitations of these technologies

## Course Intended Learning Outcomes (CILOs)

## A. Knowledge - Theoretical Understanding

a1. Outline the six hallmarks of cancer, the definition of cancer, and cancer etiology and discuss about oncogene and why it is important in cancer development, describe the function of tumor suppressor gene, how cancer cells escape cell death, and describe the various methods of DNA repair, and the defects in DNA repair related to cancer .

a2. Outline the conventional and current approaches in cancer treatment, and the Genomic and proteomic technologies in cancer treatment and diagnosis.
<b>B. Knowledge - Practical Application</b>
a3. Explain different mechanism underlying carcinogenesis and their applications in scientific research and cancer analysis.
<b>C. Skills - Generic Problem Solving and Analytical Skills</b>
b1. Analyze the scientific evidence underlying our current understanding of immunohematology to solve problems in medical analysis.
<b>D. Skills - Communication, ICT, and Numeracy</b>
b2. prove the ability to intellectual independence and commitment to lifelong learning.
<b>E. Competence: Autonomy, Responsibility, and Context</b>
c1. Use the knowledge gained from this course, in some of the specific advances in biomedical technology and how changing the way we think about the underlying causes of cancer and how we treat and diagnose it depending on our understanding of mechanisms at the cellular and molecular level.
<b>Teaching and Learning Methods</b>
<ul style="list-style-type: none"> <li>• Lectures will be given according to the specified time and location as assigned on the academic schedule (see course information above)</li> <li>• Lectures will be administrated using power-point presentations and will be provided to the students through JU e-learning website.</li> <li>• Textbook is obligatory and required by the students.</li> <li>• Any additional readings, including discussion papers, will be announced and posted on the course website.</li> <li>• Teaching duration: According to the academic calendar provided at Jadara University (JU) website</li> </ul>
<b>Assessment Methods</b>
<ul style="list-style-type: none"> <li>• Midterm Exam</li> <li>• Assignments</li> <li>• Quizes</li> <li>• Final Exam</li> </ul>

Course Contents					
Week	Hrs	CILOs	Topics	Teaching & Learning Methods	Assessment Methods
1 Oct 23 – 25 2022	3	a1	<ul style="list-style-type: none"> <li>• Introduction to the course</li> <li>• Cancer Defined</li> <li>• Etiology of Cancer</li> </ul>	Handout Textbook	Midterm & Final Exam
2 Oct 30 – Nov 25 2022	3	a1	<ul style="list-style-type: none"> <li>• Overview of the hallmarks of cancer</li> <li>• Hallmarks of Cancer I: immortality</li> </ul>	Handout Textbook	Midterm & Final Exam
3 Nov 6 – 8 2022	3	a1, a1	<ul style="list-style-type: none"> <li>• Hallmarks of Cancer II:</li> <li>• Produce ‘go’ signals or ‘growth’ signals (growth factors from oncogenes)</li> </ul>	Handout Textbook	Midterm & Final Exam
4 Nov 13 – 15 2022	3	a1, a3	<ul style="list-style-type: none"> <li>• Hallmarks of Cancer IV: Override stop signals or anti-growth signals (tumor suppressor genes)</li> <li>• Hallmarks of Cancer III:</li> <li>• Avoidance of cell death (apoptosis).</li> </ul>	Handout Textbook	Midterm & Final Exam
5	3	a3, b2	<ul style="list-style-type: none"> <li>• Hallmarks of Cancer V: Angiogenesis.</li> </ul>	Handout	Midterm

Nov 20 – 22 2022			<ul style="list-style-type: none"> <li>Hallmarks of Cancer VI: Metastasis</li> </ul>	Textbook	& Final Exam
6 Nov 27 – 29 2022	3	a3, b2,	<ul style="list-style-type: none"> <li>Hallmarks of Cancer VI: Metastasis (cont.)</li> <li>Epigenetics and cancer</li> </ul>	Handout Textbook	
7 Dec 4 – 6 2022	3	a1, a3	<ul style="list-style-type: none"> <li>Epigenetics and cancer (cont.)</li> <li>The basis of Tumorigenesis</li> </ul>	Handout Textbook	Final Exam
8 Dec 11 – 13 2022	3	a1, a3, b2	<ul style="list-style-type: none"> <li>DNA repair and predispositions to cancer</li> </ul>	Handout Textbook	Final Exam
9 Dec 18 – 20 2022	3	a1, a3, b1, b2	<ul style="list-style-type: none"> <li>telomeres and telomerases</li> <li>oxidative stress and predispositions to cancer</li> </ul>	Handout Textbook	Final Exam
10 Dec 25 – 27 2022	3	a1,a3, b1, b2, c1	<ul style="list-style-type: none"> <li>Oxidative stress and predispositions to cancer (cont.)</li> <li>The immune system and cancer</li> </ul>	Handout Textbook	Final Exam
11 Jan 1 – 3 2023	3	a2, c1	<ul style="list-style-type: none"> <li>New Genomic and proteomic technologies:</li> <li>Microarrays and gene expression profiling</li> <li>New Genomic and proteomic technologies:</li> <li>2-diminsion gel electrophoresis</li> </ul>	Handout Textbook	Final Exam
12 Jan 8 – 7 2023	3	c1, b1, b2	<ul style="list-style-type: none"> <li>New Genomic and proteomic technologies:</li> <li>MTT assay</li> </ul>	Handout Textbook	Final Exam
13 Jan 15 – 17 2023	3	a2, c1	<ul style="list-style-type: none"> <li>Treatment Regimen of malignancies</li> </ul>	Handout Textbook	Final Exam

<b>Infrastructure</b>	
<b>Textbook</b>	<b>The Biology of Cancer.</b> Weinberg, Robert A. New York: Garland Science. Second edition, 2013
<b>Electronic materials</b>	As provided at Jadara E-learning system

<b>Course Assessment Plan</b>						
<b>Assessment Method</b>		<b>Grade</b>	<b>CILOs</b>			
<b>First (Midterm)</b>		30				
<b>Second (if applicable)</b>						
<b>Final Exam</b>		50				
<b>Coursework</b>						
<b>Coursework assessment methods</b>	Assignments	5				
	Case study					
	Discussion and interaction	5				
	Group work activities					
	Lab tests and assignments					
	Presentations					
	Quizzes	10				
<b>Total</b>		100				

## **Plagiarism**

Plagiarism is claiming that someone else's work is your own. The department has a strict policy regarding plagiarism and, if plagiarism is indeed discovered, this policy will be applied. Note that punishments apply also to anyone assisting another to commit plagiarism (for example by knowingly allowing someone to copy your code).

Plagiarism is different from group work in which a number of individuals share ideas on how to carry out the coursework. You are strongly encouraged to work in small groups, and you will certainly not be penalized for doing so. This means that you may work together on the program. What is important is that you have a full understanding of all aspects of the completed program. In order to allow proper assessment that this is indeed the case, you must adhere strictly to the course work requirements as outlined above and detailed in the coursework problem description. These requirements are in place to encourage individual understanding, facilitate individual assessment, and deter plagiarism.