



Jordan University of Science and Technology
Faculty of Applied Medical Sciences
Allied Medical Sciences Department

LM781 Adnanced Diognostic Molecular Biology - JNQF Level: 7

Second Semester 2023-2024

Course Catalog

3 Credit Hours. Molecular biology is a diverse field that investigates the complex networking between the different molecules that make up the biological system, starting from DNA decoding and ending with large protein complexes. Over decades, intensive studies in this field have been providing powerful tools for the development of various diagnostic assays and molecular targeting therapies. Indeed, today's technological advances in the multi-disciplinary field of biotechnology could not have been possible without molecular biology research. This course is divided into two main parts; the first one explores the structure and mechanisms of DNA, RNA and protein synthesis, and the various techniques and approaches used in manipulating and studying these molecules. Furthermore, it covers the different mechanisms of DNA repair and recombination and emphasizes how these mechanisms provided molecular biologists with tools to study gene function and develop gene therapy approaches. The second part of the course focuses on gene expression, mechanisms of gene expression regulation, high and low through-put analysis of gene expression, and the various approaches to studying gene function in vitro and in transgenic mice. The main aim of this course is to stimulate and enhance critical thinking skills through detailed analysis of the concepts, research methodology, and experimental design in the field of molecular biology. By introducing students to the core principles of molecular biology and the past discoveries that paved the ground to today's technologies, students will develop an appreciation for those discoveries and be influenced to transform simple concepts into new discoveries and translate ideas into practice.

Teaching Method: On Campus

Text Book

Title	Molecular biology of the cell
Author(s)	Alberts
Edition	5th Edition
Short Name	1
Other Information	

Course References

Short name	Book name	Author(s)	Edition	Other Information
2	Human molecular genetics	Reed	5th Edition	

Instructor	
Name	Dr. MARYA OBEIDAT
Office Location	-
Office Hours	
Email	mmobeidat82@just.edu.jo

Class Schedule & Room
Section 1: Lecture Time: Mon : 13:00 - 16:00 Room: N4206

Tentative List of Topics Covered		
Weeks	Topic	References
Week 1	DNA Replication	From 1, From 2
Week 2	DNA cloning and restriction enzymes	From 1, From 2
Week 3	Assignment 1 discussion	
Week 4	Nucleic acid Hybridization	From 1, From 2
Week 5	Assignment 2 discussion	From 1, From 2
Week 6	DNA Repair	From 1, From 2
Week 7	Transposition and site-specific recombination	From 1, From 2
Week 8	Transcription and RNA processing	From 1, From 2
Week 9	Translation and post translational modification	From 1, From 2
Week 10	Regulation of gene expression	From 1, From 2
Week 11	Basic gene expression analysis	From 1, From 2
Week 12	Studying gene function 1	From 1, From 2
Week 13	Studying gene function 2	From 1, From 2

Week 14	Genetic testing	From 2
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Mapping of Course Outcomes to Program Outcomes and NQF Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Understand the mechanisms that regulate DNA, RNA and protein synthesis. [1MSLO1] [1L7K1]	10%	
Describe the various mechanisms of gene expression regulation and its contribution to the field of epigenetics. [1MSLO1] [1L7K1]	10%	
Understand the different molecular methods used in molecular diagnosis. [1MSLO1] [1L7K1]	20%	
Conduct critical analysis of molecular biology research [1MSLO5] [1L7S2]	20%	
Develop skills of scientific synthesis required to conduct molecular biology research [1MSLO6] [1L7S1]	10%	
Choose proper strategies to manipulate and study the changes in DNA, RNA and proteins to understand their roles in disease development. [1MSLO6] [1L7C4]	15%	
Apply proper diagnostic techniques in different clinical setups. [1MSLO6] [1L7C4]	15%	

Relationship to Program Student Outcomes (Out of 100%)											
SLO1	SLO2	SLO3	SLO4	SLO5	SLO6	MSLO1	MSLO2	MSLO3	MSLO4	MSLO5	MSLO6
						40				20	40

Relationship to NQF Outcomes (Out of 100%)			
L7K1	L7S1	L7S2	L7C4
40	10	20	30

Evaluation	
Assessment Tool	Weight
Midterm	30%
Assignment	20%
Final	50%

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