



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

LM722 Advanced Molecular Biology

First Semester 2021-2022

Course Catalog

2 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 has 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.

Text Book

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

Course References

Short name	Book name	Author(s)	Edition	Other Information
HM	Human molecular genetics	Read	4th Edition	

Instructor

Name	Dr. MARYA OBEIDAT
Office Location	Faculty of Applied Sciences 2nd floor
Office Hours	Sun : 12:00 - 14:00 Mon : 11:30 - 12:30 Tue : 10:30 - 11:30 Wed : 11:30 - 13:30
Email	mrobeidat82@just.edu.jo

Class Schedule & Room
Section 1: Lecture Time: Sun : 14:30 - 16:30 Room: M4201

Tentative List of Topics Covered		
Weeks	Topic	References
Week 1	Introduction/nucleic and amino acids	
Week 2	DNA Replication	
Week 3	DNA cloning and restriction enzymes	
Week 4	Nucleic acid Hybridization	
Week 5	DNA Repair	
Week 6	Transposition and site specific recombination	
Week 7	Transcription and RNA processing	
Week 8	PCR principle and applications	
Week 9	Transcription and RNA processing	
Week 10	Translation and post translational modification	
Week 11	Regulation of gene expression	
Week 12	Basic gene expression analysis	
Week 13	Studying gene function 1	
Week 14	Studying gene function 2	

Mapping of Course Outcomes to Program Student Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Present an understanding of the mechanisms that regulate DNA, RNA and protein synthesis.	20%	
Describe the various mechanisms of gene expression regulation and its contribution to the field of epigenetic.	20%	

Choose proper strategies to manipulate and study the changes in DNA, RNA and proteins to understand their roles in disease development.	25%	
Understand the different molecular methods used in molecular diagnosis and how to apply it in different clinical setups.	20%	
Conduct critical analysis of research articles	15%	

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

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