



Faculty: Allied Medical Sciences	
Department: Medical Laboratory Sciences (MLS)	
Program: MSc	
Academic year: 2022/2023	Semester: First

Course Plan

First: Course Information

Course No. 0701702	Course Title: <i>Advanced Diagnostic Molecular Biology</i>	Credit Hours: 3
Prerequisite: NA	Section No.: 1	Lecture Time: 12:00-3:00 pm Days: Saturday
Type Of Course:	<input type="checkbox"/> <i>Obligatory Faculty Requirement</i> <input type="checkbox"/> <i>Elective University Requirement</i> <input type="checkbox"/> <i>Obligatory University Requirement</i> <input type="checkbox"/> <i>Faculty Requirement</i> <input type="checkbox"/> <i>Course Elective Specialty Requirement</i> <input checked="" type="checkbox"/> <i>Obligatory Specialization requirement</i>	
Type of Learning:	<input checked="" type="checkbox"/> <i>Face-to-Face Learning</i> <input type="checkbox"/> <i>Blended Learning (2 Face-to-Face + 1 Asynchronous)</i> <input type="checkbox"/> <i>Online Learning (2 Synchronous+1 Asynchronous)</i>	

Second: Instructor's Information

Name: Dr. Tareq Nayef AlRamadnh		Academic Rank: Assistant Professor
Office Number: D352	Telephone Ext:	Email: talramadneh@zu.edu.jo
Office Hours:	<i>Saturday: 10:00-12:00</i> <i>Sunday 12-2</i>	

Third: Course Description

This advanced molecular biology course aims to teach students the knowledge and the critical thinking of the recent and latest literature about the structure and organization of the genome in eukaryotes compared to prokaryotes. In addition, this course aims to deepen the understanding of DNA replication and the regulation of gene expression. Mutations and their repair will be also discussed.

Fourth: Learning Source

Main Reference:	Lewin's Genes XII	
Author: Krebs J, Goldstein E	Issue No. 12th Edition ISBN-13: 978-1284104493	Publication Year: 2018
Additional Sources & Websites:	Textbooks: 1. Clark D, Pazdernik N, McGehee M. Molecular Biology 3 rd edition. 2019. Academic Press. 1001 pages 2. Weaver R. 2012. Molecular Biology 5th edition. McGraw-Hill. 915 pages Journals Recent and latest articles in the field of molecular biology	
Teaching Type:	<input checked="" type="checkbox"/> Classroom <input type="checkbox"/> Laboratory <input type="checkbox"/> Workshop <input type="checkbox"/> MS Teams <input checked="" type="checkbox"/> Moodle	

Fifth: Learning Outcomes

Course Code*	Course Learning Outcomes (CLOs)	Connection To Program Learning Outcomes (PLOs)#
Knowledge		
K1	Understanding the important concepts of molecular biology, which will provide them with the advanced knowledge and skills as graduate students.	P.k1,2,5
K2	Demonstrate knowledge in new trends in health care including molecular diagnostics, robotics, point of care, and self-testing.	P. k 2
K3	Recognize standards and protocols related to pre-analytical, analytical, and post analytical aspects of sample collection and analysis.	P. k 3,5
K4	Demonstrate full understanding of procedures and analytical techniques applied in TDM, toxicology, genetics, and inborn errors of metabolism.	P. k 1,2,4
K5	Demonstrate full understanding of physiological and biochemical changes associated with clinical disorders or conditions presented and discussed in class.	P. k 5,6

Skills		
S1	Deep understanding of the genome structure and packaging in prokaryotes and eukaryotes, gene expression and its regulation, and mutations and their repair.	P. S 1,2
S2	Interpret complex and advanced test results related to TDM, toxicology, genetic disorders, and inborne errors of disease.	P. S 2,6
S3	Practice professional skills and scientific knowledge in quality management and quality assurance of clinical laboratory.	P. S 3,5
S4	Apply essential set of skills needed to author technical reports, scientific manuscripts and monographs	P. S 4, 6
Competencies		
C1	Critical reading and understanding of the data in peer reviewed papers in different topics of molecular biology.	P .C 1,2,3
C2	Presenting and scientifically discussing different topics of molecular biology.	P .C 2,4
C3	Proficient in presenting and defending published research articles and/or data of case studies in front of students and faculty	P .C 3, 6
C4	Conducting literature search, reviewing, and criticizing published scientific articles	P. C 4, 6
C5	Demonstrate an awareness of the need for continuing education in terms of professional growth and development	P .C 5,6

#P: Program PLOs, *Codes for CLOs: K: knowledge; S: skills; C: competencies.

Sixth: Course Structure

Teaching and learning Methods and strategies

The teaching and learning methods and strategy is a mixture of lectures, problem-solving, case discussions, and oral presentations. While the format of lectures is conventional; informal interaction is encouraged. Case discussions relevant to selected topics, will be covered in the teaching sessions and will involve extensive student participation. Assignments require students to present and review journal articles. Skills and ability to present journal articles are developed through class discussion.

The table below illustrate topics to be covered in this course with corresponding ILOs

Week	Topic	ILOs	Teaching/Learning Method	Assessment Method/Tool	Reading Material
1-2	Revision of the basics of Molecular biology Genes are DNA and encode RNAs and polypeptides Methods in molecular biology (Chapter 1 & 2)	K1,2,5 C1,2 S1	Lectures (PPT) Group discussion Homework Assignments	Exams, quizzes Class participation Assignments Case study (discussion & presentations)	Book chapter(s) & Topics to be assigned by instructor.
3	The interrupted gene and the content of the genome (Chapter 3 & 4)	K1,4 C1,3 S3,5	Lectures (PPT) Group discussion Homework Assignments	Exams, quizzes Class participation Assignments Case study discussion & presentations	Book chapter(s) & Topics to be assigned by instructor.
4	Genome sequences and evolution Clusters and repeats (Chapter 5 & 6)	K2,3 C 6 S 5,6	Lectures (PPT) Group discussion Homework Assignments	Exams, quizzes Class participation Assignments Case study discussion & presentations	Book chapter(s) & Topics to be assigned by instructor.
5	Chromosomes and chromatin (Chapter 7 & 8)	K2,5,6 C2,6 S4	Case study presentation Group discussion Oral presentations	Exams, quizzes Class participation Assignments Case study discussion & presentations	topics to be assigned by instructor
6	DNA replication part I (Chapter 9, 10,& 11)	K5,6 C4 S4,6	Lectures (PPT) Group discussion Homework Assignments	Exams, quizzes Class participation Assignments Case study discussion & presentations	Book chapter(s) & Topics to be assigned by instructor.
7	DNA replication part II (Chapter 12 & 13)	K2,5 C2,34 S1,3,5	Case study presentation Group discussion Oral presentations	Exams, quizzes Class participation Assignments Case study discussion & presentations	topics to be assigned by instructor

	Midterm Exam (<i>proposed</i>)				TBA
8	Repair systems and Transposable elements (Chapter 14 & 15)	K2,5 C1,2,5 S4	Lectures (PPT) Group discussion Homework Assignments	Exams, quizzes Class participation Assignments Case study discussion & presentations	Book chapter(s) & Topics to be assigned by instructor.
9	RNA splicing and processing, mRNA stability and localization (Chapter 19 & 20)	K4,5 S1,2,4 C2,3	Case study presentation Group discussion Oral presentations	Exams, quizzes Class participation Assignments Case study discussion & presentations	topics to be assigned by instructor
10	Translation and using the genetic code (Chapter 22 & 23)	K5,6 C1,2 S1,3	Lectures (PPT) Group discussion Homework Assignments	Exams, quizzes Class participation Assignments Case study discussion & presentations	Book chapter(s) & Topics to be assigned by instructor.
11	Eukaryotic transcription regulation (Chapter 26)	K2,4,5 S1,2,4 C2,3,5	Case study presentation Group discussion Oral presentations	Exams, quizzes Class participation Assignments Case study discussion & presentations	topics to be assigned by instructor
12	Epigenetics (Chapter 27 & 28)	K5,6 C1,2,6 S4,6	Lectures (PPT) Group discussion Homework Assignments	Exams, quizzes Class participation Assignments Case study discussion & presentations	Book chapter(s) & Topics to be assigned by instructor.
13	Noncoding and regulatory RNA (Chapter 29 & 30)	K2,4,5 S1,2,4 C2,3	Case study presentation Group discussion Oral presentations	Exams, quizzes Class participation Assignments Case study discussion & presentations	topics to be assigned by instructor
14-15	Revision and Student presentations	C1,2 S5,6	Oral presentations and discussion by students	Case study discussion & presentations	TBA
16	Final Exam				

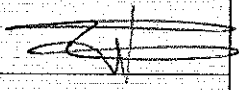
Seventh: Assessment methods

Summative assessment is through a combination of written examinations, class participation and discussion, marked assignments, and oral presentations in front of class.

Methods	Online Learning	Blended Learning	Face-To-Face Learning	Measurable Course (ILOs)
First Exam	0	0	0	
Second Exam	0	0	0	
Mid-term Exam	0	0	30	K1-5; S1-3; C1-2
Participation/Quizzes	0	0	10	All
Oral Presentations	0	0	20	S4, C3,4,5
Final Exam	0	0	40	All

Eighth: Course Policies

- All course policies are applied on all teaching patterns (online, blended, and face-to-face Learning) as follows:
 - a. Punctuality.
 - b. Participation and interaction.
 - c. Attendance and exams.
- Academic integrity: (cheating and plagiarism are prohibited).

Approved by:	Name	Date	Signature
Head of Department	Dr Kawther Amawi	18/10/2022	
Faculty Dean	Dr Hashem A. Abu-Harirah	10.2022	