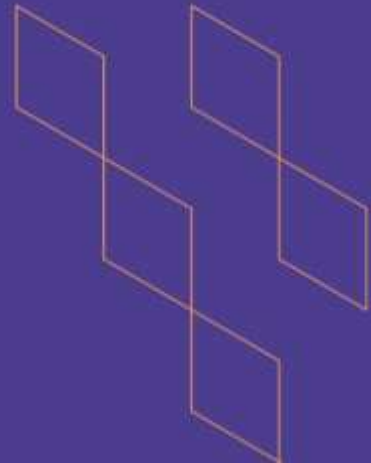




T-104  
2022

## Course Specification



Course Title: **Molecular Biology**

Course Code: **BIOL411**

Program: **Bachelor of science in Biology**

Department: **Biology Department**

College: **College of Science**

Institution: **Jazan University**

Version: **T-104**

Last Revision Date: *Pick Revision Date.*



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## A. General information about the course:

### Course Identification

1. Credit hours: 2

#### 2. Course type

a. University ☒ College ☐ Department ☐ Track ☐ Others ☐

b. Required ☐ Elective ☒

3. Level/year at which this course is offered:

#### 4. Course general Description

Molecular biology is the study of biological systems at the molecular level. Molecular biology deals with nucleic acids and proteins and how these molecules interact within the cell to promote proper growth, division, and development. It is a large and ever-changing discipline. The topics covered include; the structure and replication of DNA, chromosome organization, the molecular mechanisms underlying the recombination of DNA, the molecular basis of gene regulation, and how gene expression is tied to intracellular and extracellular factors by signal transduction pathways.

5. Pre-requirements for this course (if any): General Genetics BIOL 222

6. Co-requirements for this course (if any): None

#### 7. Course Main Objective(s):

At the end of the course students will be able to:

This course is designed to provide students with the following concepts:

1. To study the structure of Nucleic Acids.
2. To identify the differences between DNA and RNA.
3. To study the Replication of DNA, Transcription, and translation of genetic codes
4. To understand the Damage and repair of DNA.
5. To compare the Mitochondrial DNA and Nuclear DNA structure and functions.
6. To DNA sequencing of genetic material
7. To study Gene's silence

### 1. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom	10	76.9%
2.	E-learning	1	7.7%
3.	Hybrid <ul style="list-style-type: none"> <li>Traditional classroom</li> <li>E-learning</li> </ul>	1	7.7%
4.	Distance learning	1	7.7%



## 2. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	11
2.	Laboratory/Studio	11
3.	Field	-
4.	Tutorial	-
5.	Others (Self-study)	2
	Total	24

## B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Define all principles, concepts, theories, and aspects concerning Molecular Biology,	K1.1	Lectures	Quizzes, Short Answer Question (SAQ), MCQs
1.2	Compare different structures, functions, and mechanisms related to Molecular Biology	K2.1	Lectures	Direct questions
1.3	Interpret knowledge and understanding of some techniques in practical or theoretical related to Molecular Biology	K3.2	Lectures, Lab work	Long or short answer questions, homework
2.0	Skills			
2.1	Debate the theories, principles, and processes in Molecular Biology.	S1.1	Lectures	Long or short answer questions
2.2	Argue different cell biology approaches in laboratory or field or even theoretically.	S2.2	Lectures	Long or short answer questions
2.3	Write a report about any practical or theoretical tasks related to biological science	S3.3	Lectures, Lab work	Long or short answer questions
3.0	Values, autonomy, and responsibility			
3.1	Access multiple sources of information, capture essential information, and distinguish it	3.1		



Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	from extraneous data.			
3.2	Illustrate awareness of risk assessment and safety observation when dealing with various equipment in various fields.	3.2	Lab work	Practical exam- Homework

## C. Course Content

No	List of Topics	Contact Hours
1.	Important terms in Molecular Biology, and an introduction to DNA and RNA structures	2
2.	Chromatin and chromosomes structure	2
3.	Replication of DNA	2
4.	Transcription and translation of genetic codes	2
5.	Gene Expression	2
6.	Molecular gene structure in prokaryotes and eukaryotes.	2
7.	Damage and repair of DNA	2
8.	Mitochondrial DNA structure and functions.	2
9.	DNA sequencing of genetic material.	2
10.	Plasmid DNA structure and types	2
11.	Gene silence, New updates in the molecular biology	2
Total		22

## D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Written assignment	3	5%
2.	Theoretical quiz	3	5%
3.	mid-term exam	6	10%
4.	Practical quiz	4	5%
5.	Practical assignment	6	5%
6.	Final practical exam	10	20%

\*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)



## E. Learning Resources and Facilities

### 1. References and Learning Resources

Essential References	<ul style="list-style-type: none"> <li>البيولوجيا الجزيئية للخلية. أ.د رفعت غريب أبو العلا و د. محمد رفعت غريب 2012. المكتب المصري الحديث</li> </ul>
Supportive References	<ul style="list-style-type: none"> <li>Brock biology of microorganisms Global edition (2022), by <a href="#">Michael T. Madigan</a>, <a href="#">Kelly S. Bender</a> and <a href="#">Daniel H. Buckley</a></li> </ul>
Electronic Materials	<ul style="list-style-type: none"> <li>General Authority for Meteorology and Environmental Protection Saudi Arabia <a href="http://www.pme.gov.sa">http://www.pme.gov.sa</a></li> <li>Saudi Wildlife Authority Website <a href="http://www.swa.gov.sa/index.php/en">http://www.swa.gov.sa/index.php/en</a></li> </ul>
Other Learning Materials	-----

### 2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Traditional classrooms and E-learning
Technology equipment (projector, smart board, software)	(projector, smart board, software)
Other equipment (depending on the nature of the specialty)	NA

## F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students Course Coordinator	Direct (Questionnaire)
Effectiveness of students assessment	Peer Reviewer	Direct (Cross Check marking)
Quality of learning resources	Students Course Coordinator Quality Committee	Indirect
The extent to which CLOs have been achieved	Course Coordinator Quality Committee	Indirect
Other	----	----

**Assessor** (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

**Assessment Methods** (Direct, Indirect)

## G. Specification Approval Data

COUNCIL /COMMITTEE	Biology Department Board
REFERENCE NO.	BIO2214
DATE	20/9/2022AD

