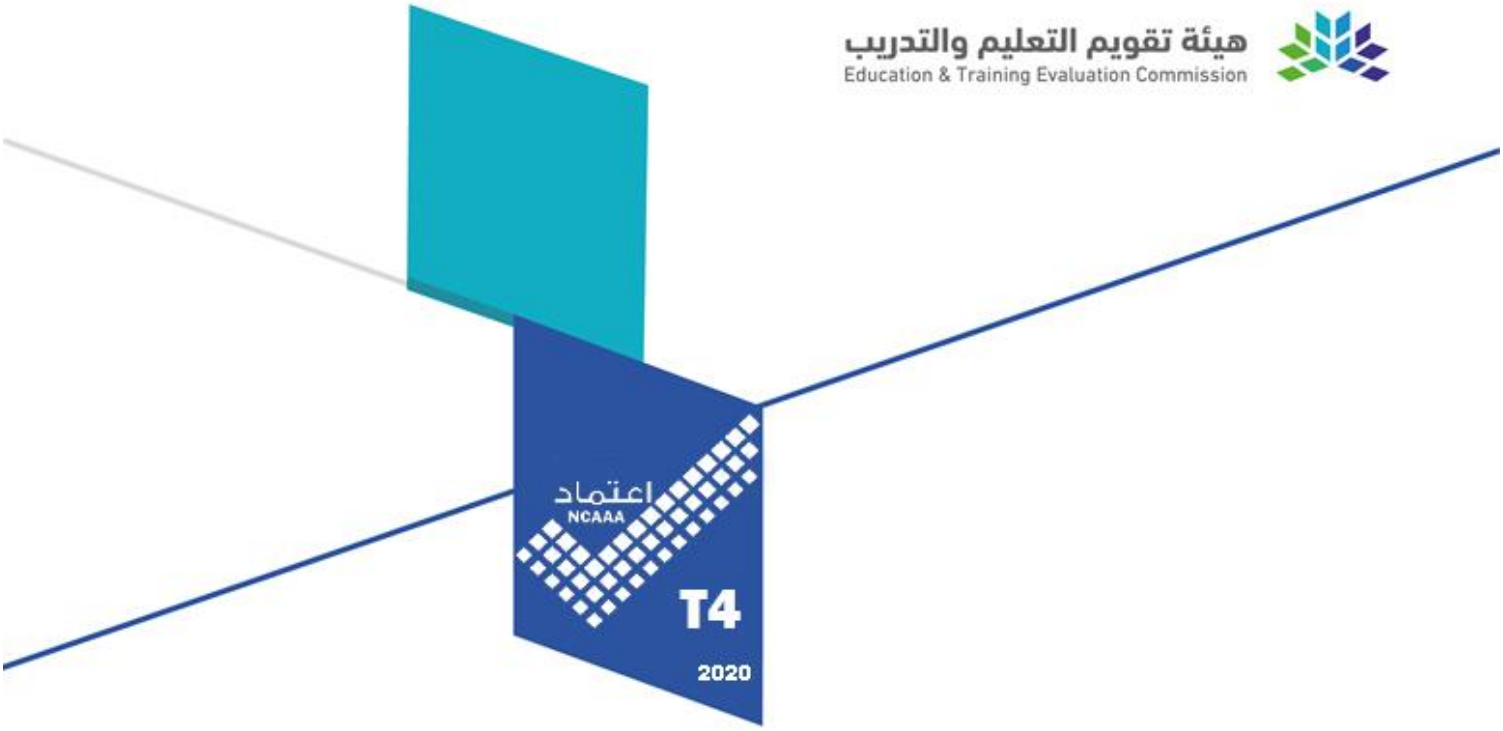
هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission



Course Specifications

Course Title:	Molecular Biology
Course Code:	**411BIO-2**
Program:	**Biology**
Department:	**Biology**
College:	**Science**
Institution:	**Jazan University**

Table of Contents

A. Course Identification

1. Credit hours:
2. Course type **a.** University ☐ College ☐ Department ☒ Others ☐ **b.** Required ☒ Elective ☐
3. Level/year at which this course is offered: 7/4 th year
4. Pre-requisites for this course (if any)**:** **Cell Biology 211BIO, General Genetics 222BIO**
5. Co-requisites for this course (if any)**:** **None**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	13 H	86.7%
2	**Blended**	2 H	13.3%
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	**15**
2	**Laboratory/Studio**	**30**
3	**Tutorial**	
4	**Others** (specify)	
	Total	**45**

B. Course Objectives and Learning Outcomes

1. Course 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.

2. Course Main Objective

This course is designed to provide students with a background in molecular genetics. The two main learning objectives of this course are; the development of an understanding of gene expression and gene regulation, and the familiarization of students with the experimental approaches used in molecular biology.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	

CLOs		Aligned PLOs
1.1	Define all principals, concepts, theories, and aspects concerning with Molecular Biology,	K1.1
1.2	Compare between different structures, functions, mechanisms related to Molecular Biology	K2.1
1.3	Draw mechanisms of synthesis large molecules related to Molecular Biology	K2.3
1.4	Interpret knowledge and understanding of some techniques in practical or theoretical related to Molecular Biology	K3.2
2	**Skills :**	
2.1	Debate the theories, principles, and processes in Molecular Biology.	S1.1
3	**Values:**	
3.1	Illustrate awareness of risk assessment and safety observation when dealing with various equipment at various fields.	V2.2

C. Course Content

No	List of Topics	Contact Hours
1	**The Nucleus, Chromosomes, Nucleic Acids.**	2
2	**DNA Structure, Assembly, Replication, Translation..**	2
3	**Genetic Code, Gene Structure and Expression.**	2
4	**Extra-nuclear Genes, Genetic Basis of Inheritance.**	2
5	**Gene Cloning (Endonucleases, Vectors, Plasmids, Viruses).**	2
6	**Gene Cloning (Complementary DNA, Reverse Genetics)..**	2
7	**Gene Cloning (DNA Repair, Sequencing, & Finger Printing).**	2
Total		14

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1	Define all principals, concepts, theories and aspects concerning with Molecular Biology,	Lectures	Quizzes, Short Answer Question (SAQ), MCQs
1.2	Compare different structures and features related to Molecular Biology	Lectures	Direct questions
1.3	Draw mechanisms of synthesis large molecules related to Molecular Biology	Lectures, Lab work	Short answer questions-Homework
1.4	Interpret knowledge and understanding of some techniques in practical or theoretical related to Molecular Biology	Lectures, Lab work	Long or short answer questions, homework
2.0	**Skills**		
2.1	Debate the theories, principles and processes in Molecular Biology.	Lectures	Long or short answer questions
3.0	**Values**		
3.1	Illustrate awareness of risk assessment and safety observation when dealing	Lab work	Practical exam-Homework

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
	with various equipment at various fields.		

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Written assignment	3	5
2	Theoretical quiz	5	5
3	Mid-term exam	7	10
4	Practical Mid-term exam	9	10
5	Group assignment	11	5
6	Final practical exam	13	15
7	Final exam	15	50

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

10 Office hours/Faculty/week

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	-البيولوجيا الجزيئية للخلية. أ.د رفعت غريب أبو العلا و د. محمد رفعت غريب 2012. المكتب المصري الحديث Ream W., Field K.G. (2005) Molecular biology an intensive laboratory course. - Karp G. (2007) Cell and Molecular Biology. John Wiley, New York.
Essential References Materials	brock biology of microorganisms 15th edition (2018), by Michael T. Madigan, Kelly S. Benderand Daniel H. Buckley
Electronic Materials	https://www.ncbi.nlm.nih.gov/pubmed/
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	1 Lecture room(s) for groups of 50 students. 1 Laboratory for group of 25 students.
Technology Resources (AV, data show, Smart Board, software, etc.)	AV, data show, Smart Board
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	PCR, Sequencer, RE, Kits, glassware, chemicals, Molecular Biology books and software.

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching	Students, Faculty	Direct (Questionnaire)
Effectiveness of assessment	Peer Reviewer	Direct (Cross Check marking)
Extent of achievement of course learning outcomes	Program Leader	Indirect (QA Committee)
Quality of learning resources	QA. Committee	Indirect (Benchmarking)

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	**Board of Biology Program**
Reference No.	**TH MEETING OF THE BOARD OF BIOLOGY DEPARTMENT 1441-1442**
Date	**Updated/Revised Feb19, 2021**