2023
TP-153

Course Specification
(Bachelor)

Course Title:	**Molecular Biology**
Course Code:	**2052203-3**
Program:	**Bachelor in Biotechnology**
Department:	**Biotechnology Department**
College:	**College of Science**
Institution:	**Taif University**
Version:	V4
Last Revision Date:	3/1445 – 9/2023

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours:					
3 (2 Lecture, 1 Lab)					
2. Course type					
A.	☐ University	☐ College	☒ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: (4th level / 2nd Year).					
4. Course general Description:					
This course introduces to the students a detailed study of macromolecules and the core molecular processes that enable cells to function. Topics will include molecular biology of carbohydrate, lipids, proteins, nucleic acids, enzyme kinetics, gene expression, protein synthesis and degradation, signal transduction in plants and animals and systems biology.					
5. Pre-requirements for this course (if any)**:**					
Cell Biology, 2052102-3					
6. Co-requisites for this course (if any)**:**					
NONE					
7. Course Main Objective(s):					
Understand the basis of genome maintenance and gene expression, concepts and principles of recombinant DNA technology, distinguish between different molecular biology techniques, and probe for specific proteins, nucleic acids, and their interactions.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100%
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	15
3.	Field	
4.	Tutorial	
5.	Others (specify)	
Total		45

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	Describe the structure and function of macromolecules and enzymes	K1	Lecture	Written Exam
1.2	Recognize the various signal transduction pathways in plants and animals	K1	Lecture	Written Exam
...				
2.0	Skills			
2.1	Practice data collection, organization, and interpretation	S3	Project	Written exam (Practical)
2.2	Present data of small project	S3	Discussion	Report
3.0	**Values, autonomy, and responsibility**			
3.1	Participate in teamwork	V2	Discussion	Report

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to molecular and cellular biology	**2**
2.	Biological molecules: nucleic acids	**2**
3.	Biological molecules: carbohydrates	**2**
4.	Biological molecules: lipids	**2**

5.	Biological molecules: proteins	2
6.	Enzymes: Structures, functions, kinetics	4
7.	Signal transduction in animals	4
8.	Signal transduction in Plants	4
9.	Protein synthesis and degradation	4
10.	Systems Biology	4
Total		30

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm Exam	Week 7	20%
2.	Periodical exam	Week 9	10%
3.	Report	Week 11	10%
4.	Practical Exam	Week 14	20%
5.	Final Exam	Week 16	40%

*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	An Introduction to Genetic Analysis, 7th edition, Anthony JF Griffiths, Jeffrey H Miller, David T Suzuki, Richard C Lewontin, and William M Gelbart, New York: W. H. Freeman; 2000. - Brown, T (2012) Introduction to Genetics: A Molecular Approach. Garland Science
Supportive References	Alberts B, Johnson A, Lewis J, Raff M, Roberts K & Walter P (2002) Molecular Biology of the Cell (4th edition). Garland Science
Electronic Materials	NBCI website (https://www.ncbi.nlm.nih.gov)
Other Learning Materials	1. DNA analysis software 2. Protein structure analysis software 3. genome databases

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	One classroom with internet connection for 2 hours a week and one laboratory for 3 hours a week with internet facility.
Technology equipment (projector, smart board, software)	Data show, DNA and proteins analysis software, internet connection
Other equipment (depending on the nature of the specialty)	**1**. DNA and RNA kits 2. DNA and proteins Electrophoresis 3. PCRs 4. Gel documentations system

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	**Direct (Independent Reviewer), Indirect (survey)**
Effectiveness of Students assessment		**Direct (Random Correction)**
Quality of learning resources	Students	**Indirect (survey)**
The extent to which CLOs have been achieved	Students, Peer Reviewer	**Direct & Indirect**
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Department Council
REFERENCE NO.	**6**
DATE	**5/11/2023**

قسم التقنية الحيوية بكلية العلوم
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