هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

Course Specification
(Bachelor)

Course Title:	**Molecular Genetics**
Course Code:	**2052204-3**
Program:	**Bachelor in Biotechnology**
Department:	**Biotechnology Department**
College:	**College of Science**
Institution:	**Taif University**
Version:	**V4**
Last Revision Date:	**4/1445 – 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 provides a detailed coverage of structural organization of DNA and RNA, DNA replication and its regulation, gene expression, regulation of gene expression at different levels, cis and trans acting elements, nucleic acid-protein interaction and gene regulation, RNA modifications (capping, polyadynelation, splicing, editing), molecular mechanisms of mutation, DNA repair, recombination, and gene regulation via epigenetics.					
5. Pre-requirements for this course (if any)**:**					
Genetics, 2052104-3					
6. Co-requirements for this course (if any)**:**					
None					
7. Course Main Objective(s):					
To study the detailed structure of DNA and RNA, the molecular DNA replication, transcription, and translation, RNA modificaitons, mutation, DNA repair, recombination, and gene regulation in prokaryotes and eukaryotes.					

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 structure, function, replication, and processing of nucleic acids	K3	Lecture	Written Exams
1.2	Outline the different levels of gene regulations of prokaryotes as well as eukaryotes	K3	Lecture	Written Exams
1.3	Explain the molecular bases of mutations, DNA repair, and recombination	K4	Lecture	Written Exams, Report
2.0	Skills			
2.1	Practice analysis of nucleic acids and gene expression	S3	Project	Written Practical Exam
3.0	**Values, autonomy, and responsibility**			
3.1	Participate in teamwork	V2	Group Discussion	Oral Exam

C. Course Content

No	List of Topics	Contact Hours
1.	**Structure and function of DNA and RNA**	**4**

2.	DNA replication and regulation of replication	2
3.	Gene expression in prokaryotes as well as eukaryotes including transcription, posttranscriptional modifications (RNA processing), and translation	4
4.	Molecular mechanisms of mutation	4
5.	DNA repair	2
6.	Genetic recombination	4
7.	Regulation of gene expression in prokaryotes and operon theory	4
8.	Regulation of gene expression in eukaryotes including cis and trans acting elements, nucleic acid-protein interaction, epigenetics.	4
9.	Analysing and manipulating DNA	2
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 10	10%
3.	Report, Oral Exam	Week 11	10%
4.	Practical Exam	Week 15	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	**Introduction to Genetics: A Molecular Approach 1 edition, Terry Brown, Garland Science, 2011**
Supportive References	Molecular Biology of the Cell, 4th edition, Bruce Alberts, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts, and Peter Walter, New York: Garland Science; 2002. ISBN-10: 0-8153-3218-1ISBN-10: 0-8153-4072-9
Electronic Materials	**NBCI website (https://www.ncbi.nlm.nih.gov)**
Other Learning Materials	**Simulation of replication, recombination, and gel analysis software**

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	1. One classroom 2 hours per week for each section 2. Laboratory 3 hours per week for each practical section

Items	Resources
Technology equipment (projector, smart board, software)	**Gel documentation instrument, PCR, Electrophoresis units, centrifuge, pipettes,**
Other equipment (depending on the nature of the specialty)	**DNA isolation kits**

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	**Peer Review, Students**	**Direct (Independent Reviewer), Indirect (survey)**
Effectiveness of Students assessment	**Faculty members**	**Direct (Random Correction)**
Quality of learning resources	**Students**	**Indirect (survey)**
The extent to which CLOs have been achieved	**Faculty members**	**Direct**
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
Biotechnology Department
TU جامعة الطائف TAIF UNIVERSITY