



Course Specification

— (Postgraduate)

Course Title: Principle of Molecular and Cellular Biology

Course Code: 373500-4

Program: Master's in clinical laboratory sciences:
Molecular Diagnostics Techniques and Diagnostic hematology

Department: Clinical Laboratory Sciences

College: Applied medical Sciences

Institution: Taif University

Version: No 3

Last Revision Date: 18/01/2024



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A. General information about the course:

1. Course Identification:

1. Credit hours: (4 hrs)			
2. Course type			
A.	<input type="checkbox"/> University	<input type="checkbox"/> College	<input checked="" type="checkbox"/> Department <input checked="" type="checkbox"/> Track
B.	<input checked="" type="checkbox"/> Required		<input type="checkbox"/> Elective
3. Level/year at which this course is offered: (1st level/1styear)			
4. Course general Description:			
<p>1- Provide core knowledge of the form, function and role of the molecular central dogma in biological processes and further enable an understanding of biological phenomena at the molecular level.</p> <p>2- provide the fundamental knowledge and techniques that underpins modern cell biology, molecular biology.</p>			
5. Pre-requirements for this course (if any):			
None			
6. Pre-requirements for this course (if any):			
None			
7. Course Main Objective(s):			
<p>1- Students will gain an in-depth knowledge of nucleic acid structure, molecular genetics and the biochemistry of transcription and protein synthesis.</p> <p>2- Students will develop their understanding of core topic areas such as –omics, the regulation of gene expression in eukaryotes and the manipulation of genetic material to produce novel organisms. 3-students will be able to list key points on the use of a range of techniques for the investigation and manipulation of nucleic acids.</p>			

2. Teaching Mode: (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	4 hours /week= 60 hours/semester	100
2	E-learning	N/A	0
3	Hybrid <ul style="list-style-type: none"> • Traditional classroom • E-learning 	N/A	0
4	Distance learning	N/A	0



3. Contact Hours: (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	60
2.	Laboratory/Studio	N/A
3.	Field	N/A
4.	Tutorial	N/A
5.	Others (specify).....	N/A
	Total	60

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

Code	Course Learning Outcomes	Code of PLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Describe the regulatory mechanism involved with the gene expression and describe the genetic control of protein production.	K1	Interactive lecture, Concept mapping and analysis	Assignments, exams
1.2	Understanding of actual trends in molecular genetics, biology and biotechnology.	K1	Interactive lecture, Concept mapping and analysis	Assignments, exams
2.0	Skills			
2.1	Apply the knowledge to the work or vocation in a professional manner and have competencies typically demonstrated through devising and defending arguments and solving problems within their field of study	S2	Interactive lecture, Concept mapping and analysis	Assignments, case presentation





Code	Course Learning Outcomes	Code of PLOs aligned with program	Teaching Strategies	Assessment Methods
3.0	Values, autonomy, and responsibility			

C. Course Content:

No	List of Topics	Contact Hours
1.	Introduction (Structure, Function, Replication of DNA, Gene expression)	4
2.	Histone modifications, chromatin structure, and epigenetic regulation of gene expression	8
3.	Regulatory RNA	4
4.	Non coding RNA and Genome Editing Technologies Research method III: Research Protocol, designing studies and ethics consideration.	4
5.	Genomics, transcriptomics, proteomics and other 'omics' technologies	8
6.	Protein maturation, folding and sorting	4
7.	Proteomics	4
8.	Therapeutic protein	4
9.	Receptors and intracellular signaling	8
10.	Biotechnology via genomic engineering techniques eg, (Next Generation Industrial Biotechnology (NGIB) on Extremophiles, Engineering of Yeast for Enhancement of Ethanol Fermentation; (Metabolic engineering of E. coli)	4
11.	Molecular cell biology and imaging	4
12.	Molecular diagnostic medicine and Current trends in molecular biology	4
Total		60

D. Students Assessment Activities:

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Assignment	5th, 10th	40%
2.	Case presentation	12th	20%
3.	Exam	20 th	40%
	Total		100%

*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	Burton E. Tropp. Principles Of Molecular Biology, Jones & Bartlett Learning; Illustrated edition (December 28, 2012)
Supportive References	-
Electronic Materials	Journals, Scientific Magazines and Articles.
Other Learning Materials	-

2. Educational and Research Facilities and Equipment Required:

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms and Laboratories
Technology equipment (Projector, smart board, software)	Data show, Blackboard and A/V
Other equipment (Depending on the nature of the specialty)	None

F. Assessment of Course Quality:

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Peer evaluators	Direct: Peer evaluation
Effectiveness of student's assessment	Students	Indirect: Questionnaire Survey at the end of each semester.
Quality of learning resources	Program Leaders /Teaching staff/ Development and accreditation committee	Indirect: Review by Department Committee
The extent to which CLOs have been achieved	Program Leaders /Teaching staff/ Development and accreditation committee	Indirect: Review course reports and program annual reports by Department Committee
Other	-	-

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

Assessment Methods (Direct, Indirect)





G. Specification Approval Data:

COUNCIL /COMMITTEE	Department council
REFERENCE NO.	06
DATE	21/01/2024

