



Course Specification

— (Bachelor)

Course Title: Molecular Human Genetics

Course Code: 2053105-3

Program: Bachelor in Biotechnology

Department: Biotechnology Department

College: College of Science

Institution: Taif University

Version: V4

Last Revision Date: 3/1445 – 9/2023



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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: (5th level/3rd year)

4. Course General Description

This course covers the following topics: the fundamental principles and mechanisms of heredity and variation, human chromosomes and chromosome aberrations, molecular mechanisms of mutation, DNA repair and recompilation, molecular cytogenetics, human cell signaling, the human genome project, human population genetics, DNA fingerprinting, molecular aspects of human genetics and society, the molecular bases of cancer, human genetic diseases, mapping the human genome, the molecular analysis of single gene and complex disorders, gene therapy, gene testing, ethical considerations connected with the use of gene technology.

5. Pre-requirements for this course (if any):

Molecular Genetics , 2052204-3

6. Pre-requirements for this course (if any):

None

7. Course Main Objective(s):

The objective of this course is to recognize the principle concepts of human genetics including normal and abnormal stats, explain the molecular basic of cancer and human genetic diseases and recognize the use of gene therapy and gene testing

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100%



No	Mode of Instruction	Contact Hours	Percentage
2	E-learning		
3	Hybrid <ul style="list-style-type: none"> • Traditional classroom • E-learning 		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
	Lectures	30
	Laboratory/Studio	45
	Field	
	Tutorial	
	Others (specify)	
Total		75

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	State the approaches of studying human molecular genetics	K3	Lecture	Written Exams





Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.2	Explain human genome project, human population genetics and DNA fingerprinting	K3	Lecture	Written Exams
1.3	Recognize the risk and benefits of human genetics applications	K4	Discussion	Written Exams
2.0	Skills			
2.1	Practice various techniques to study the human genome	S4	Project	Practical Exam, Report
3.0	Values, autonomy, and responsibility			
3.1	Represent leadership and independence	V4	Lecture	Oral Exam
3.2	Be committed to team work and responsibility	V4	Discussion	Report

C. Course Content

No	List of Topics	Contact Hours
1	Basic principle of heredity and variation	2
2	Human Chromosomal structure and chromosome aberrations	4
3.	Molecular mechanisms of mutation, DNA repair and recompilation, molecular cytogenetics, human cell signaling	6
4.	Human genome project, human population genetics, pedigree analysis and DNA fingerprinting	6
5.	The human genome: from mapping to sequencing	2
6.	Cancer genetics: oncogenes	2
7.	Cancer genetics: tumor suppressors	2



8.	Cancer genetics: genetic background and environment	3
9.	Gene therapy and gene testing	3
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	Week 11	10%
4	Practical Exam, Oral 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	1. Human Molecular Genetics, 2009, Peter sudbery 2. Introduction to genetics: A molecular Approach. 2011, Terry Brown
Supportive References	NCBI website (http://www.ncbi.nlm.nih.gov)
Electronic Materials	NCBI website (http://www.ncbi.nlm.nih.gov)
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
<p>facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)</p>	<ol style="list-style-type: none"> One classroom 2 hours per week for each section Laboratory 3 hours per week for each practical section



Items	Resources
Technology equipment (projector, smart board, software)	1. Projector for each classroom 2. Projector in each laboratory
Other equipment (depending on the nature of the specialty)	Thermal cycler, Gel documentation system

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