2023
TP-153

Course Specification
(Bachelor)

Course Title:	**Genetics**
Course Code:	**2052104-3**
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 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: (3rd level/2nd year)					
4. Course general Description:					
The genetics course will introduce students with the principles of traditional and modern genetic concepts. In this course, students will study Mendelian genetics including allele segregation and independent assortment, dominance, sex determination and sex-linked characteristics, pedigree analysis and its applications, mutations and chromosome number variations, the molecular bases of heredity, transposable elements and cytoplasmic genetics, population genetics, and epigenetics.					
5. Pre-requirements for this course (if any)**:**					
Introduction to Biotechnology, 2051204-3					
6. Co - Pre-requirements for this course (if any)**:**					
None					
7. Course Main Objective(s):					
This course will provide students with the basic knowledge of mendelian genetics, basic genetic analysis and risk assessment, genetics of sex determination, systems of sex-linked genetics, extranuclear genetics, the main concepts of population genetics, and the molecular mechanisms of epigenetics.					

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 basics of classical and modern genetics	**K1**	Lecture	Written Exams
1.2	Outline the different types of genetics crosses and abnormalities	**K1**	Lecture	Written Exams
1.3	Analyze population genetics and epigenetics	**K2**	Lecture, Project	Written Exam, Report
2.0	**Skills**			
2.1	Analyze the genetic pedigrees and gene frequencies.	**S3**	Problem solving	Written Exam (Practical)
3.0	**Values, autonomy, and responsibility**			
3.1	**Contribute in a teamwork**	**V3**	Project	Report

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to genetics, genetics and organism, sources of genetic variations	3
2.	Mendelian inheritance, complete dominance, monohybrids, dihybrids, Mendel laws	3
3.	Incomplete dominance, codominance, multiple alleles, lethal genes, polygenic inheritance	6
4.	Sex determination, sex-linked genetics	3
5.	Mutations, recombination, changes in chromosome number, and polyploidy	3
6.	Molecular bases of heredity	3
7.	Transposable elements	2
8.	Cytoplasmic inheritance	2
9.	Population genetics	2
10.	Epigenetics	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 12	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	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.
Supportive References	1. Hartwell LH, Hood L, Goldberg ML, Reynolds AE, Silver LM. Genetics: from genes to genomes. McGraw-Hill; 2011. 2. Brooker RJ. Genetics: analysis & principles. Reading, MA, USA:: Addison-Wesley; 1999. 3. Klug WS, Cummings MR. Concepts of genetics. Pearson Education, Inc; 2003.

Electronic Materials	https://www.genome.gov/genetics-glossary/Sex-Linked https://www.genome.gov/genetics-glossary/Mendelian-Inheritance
Other Learning Materials	**1. karyotype analysis software** **2. Pedegree analysis software (https://www.progenygenetics.com/online-pedigree)** **3. Classical genetic simulator (cgslab.com).**

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
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)	1. Microscopes (15 per each lab section) 2. slide set for Mitosis, Meiosis I, and Meiosis II

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