هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

T-104
2022

Course Specification

Course Title:	**General Genetics**
Course Code:	**BIOL222**
Program:	**Biology**
Department:	**Biology**
College:	**Science**
Institution:	**Jazan University**
Version:	**4**
Last Revision Date:	2nd semester 2022

Table of Contents:

A. General information about the course:

Course Identification					
1. Credit hours:					
2. Course type					
a.	University ☐	College ☐	Department☒	Track☐	Others☐
b.	Required ☒	Elective☐			
3. Level/year at which this course is offered: **Level 6 – 2nd Year**					
4. Course general Description ➢ The general genetics course deals with the general principles in generics. ➢ This course studies some of the special topics in genetics like nucleic acids, chromosomes, mutations, Mendelian genetics and non-Mendelian genetics, multiple alleles, and ge engineering.					
5. Pre-requirements for this course (if any): **Cell Biology (BIOL 211)**					
6. Co- requirements for this course (if any): None					
7. Course Main Objective(s) • To relate the structure and function of the DNA molecule. • To describe normal chromosome number, structure, and behavior in biological cells. • To understand the cause and effect of alterations in chromosome number and/or structure. • To study how to identify and classify mutations in DNA. • To understand the principles and mechanisms of the inheritance of traits from one generation to the next. • To know the basics of genetic engineering.					

1. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom	10	77%
2.	E-learning	1	7.7%
3.	Hybrid • Traditional classroom • E-learning		
4.	Distance learning	1	7.7%

2. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	11
2.	Laboratory/Studio	22
3.	Field	
4.	Tutorial	
5.	Others (self learning)	2
	Total	35

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	Define all principals, concepts, theories and aspects concerning with genetics	K1.1	Lectures, lab work	Theory quiz, Practical quiz, Theory final
1.2	Compare between different mechanisms, functions, practices and aspects related to genetics	K2.1	Lectures, lab work	Theory midterm, Practical final
1.3	Explain all processes, mechanisms, definitions, theories, mode of actions of genetics.	K2.2	Lectures, lab work	Practical final, Theory final
1.4	Interpret by using your knowledge and understanding some of phenomena concerning with genetics	K3.2	Lectures	Theory final
2.0	Skills			
2.1	Argue different biological approaches in laboratory or field or even theoretically.	S2.2	Lectures, lab work	Theory midterm, Practical final, Theory final
2.2	Propose solutions for different complex genetical problems	S3.2	Lectures, lab work	Practical assignment, Practical final, Theory final
2.3	Write a report about any practical or theoretical tasks related to genetics	S3.3	Lectures	Theory final
3.0	Values, autonomy, and responsibility			
3.1	Apply practices of life-long learning in genetics for their professional career	V1.1		Theory assignment

C. Course Content

No	List of Topics	Contact Hours
1.	General introduction -Chromosomes (Definition- Number – Size and shape – Structure- General properties)	1
2.	Chromosomal aberrations: i- Structural Chromosomal Aberrations (Chromosome Type Aberrations- Chromatid Type Aberrations –	1

	Translocation- Deletion- Duplication- Inversion- Reciprocal translocation and ii- Numerical Chromosomal Aberrations (Aneuploidy – Euploidy).	
3	***Nucleic acids: Deoxyribonucleic acid (DNA) – Ribonucleic acid (RNA) - Nucleotide structure – DNA structure – Types and Function of RNA- Comparison between DNA and RNA	1
4	Genetic Code and Protein Synthesis: Definition of genetic code – Start codon – Stop Codon- Steps of protein synthesis.	1
5	Mutations: Definition of mutation – Site of mutations – Mutation types (Spontaneous mutations- Induced mutations – Lethal mutations – sublethal mutations – point or genetic mutations – chromosomal mutations- forward mutations – backward mutations) – mutations characteristics – chemical mutants – physical mutants.	1
6	Mendelian Genetics: Mendel first law (law of segregation) – Complete dominance - Cross test – Mendel second law (law of independent assortment).	2
7	Non-Mendelian Genetics: Incomplete dominance – Codominance – Epistasis – Multiple alleles – Polymorphism	1
8	Sex linked inheritance: Sex chromosomes – Sex linked genes – Sex linked inheritance in human (Hemophilia – Color Blindness)- Sex limited inheritance – Sex influenced inheritance	1
9	Multiple alleles:(ABO system – Rh factor – Variation of Rh Factor – Genetics of Rh factor). Relatives marriage and genetic diseases	1
10	***Genetic engineering: Development of genetic engineering – Tools used in genetic engineering (restriction enzymes – Plasmids – Gel Electrophoresis – DNA Sequencing – Taq polymerase – PCR) – Applications of Genetic Engineering in (Medical Field – Animal Production Field – Agricultural Production Field – Industrial Field – Environmental Field – Security Field) – Genomic Modified Organisms – Hazards of Genetic Engineering.	1
Total		11

***هذه المواضيع سوف تدرس حضوريا او ذاتيا حسب الوقت المتاح

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Theoretical Quiz	4	5
2.	Practical Quiz	5	5
3.	Theory Midterm	6	10
4	Theory Homework	7	5
5	Practical Homework	9	5
6	Practical Final	11	20
7	Final exam	12	50

*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	علم الخلية والوراثة (2013 م). تأليف د. سـعد بن حسـين القحطاني. النشـر العلمي والمطابع- جامعة الملك سعود- الرياض –المملكة العربية السعودية Cell Biology and Genetics (2013) by Saad H. Al-Qahtani, King Saud University-Riyadh- KSA
Supportive References	➢ Genetics: Analysis and Principles (7th ed.) (2020) by R. J. Brooker. McGraw-Hill Education, USA. ➢ Genetics: A Conceptual Approach (7th Ed) (2019) by B. A. Pierce. W. H. Freeman and Company. NY, USA.
Electronic Materials	https://www.marefa.org/الوراثة
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	1 Lecture room(s) for groups of 25 students. 1 Laboratory for group of 15 students
Technology equipment (projector, smart board, software)	AV, data show, Smart Board
Other equipment (depending on the nature of the specialty)	Light microscopes, glassware, chemicals, consumables

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students, Faculty	Direct (Questionnaire)
Effectiveness of students assessment	Peer Reviewer	Direct (Cross Check marking)
Quality of learning resources	QA. Committee	Indirect (Benchmarking)
The extent to which CLOs have been achieved	Program Leader	Indirect (QA Committee)
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval Data

COUNCIL /COMMITTEE	Biology Department Board
REFERENCE NO.	BIO2214
DATE	20/9/2022AD