هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

Course Specification
(Bachelor)

Course Title:	*General Genetics*
Course Code:	*BIO1305*
Program:	*Bachelor of Science in Biology*
Department:	*Department of Biology*
College:	*Faculty of Science*
Institution:	*University of Tabuk*
Version:	***Course Specification Version Number***
Last Revision Date:	*September 2023*

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours:					
3 Credit (2 theoretical + 1 practical) hours					
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:					
The course includes introduction, historical background and basic concepts of genetics, genetic crosses, Mendelian laws; dominance (segregation and independent assortment), gene interaction, incomplete dominance, codominance, lethal genes, mutations, crossing over, gene mapping and sex determination. It also covers topics on multiple alleles and allele types, cell cycle and significance of meiosis, structure of DNA and RNA, DNA packaging in the chromosome, DNA replication, DNA synthesis in prokaryotes & eukaryotes, transcription, and translation of messenger RNA (mRNA), and protein synthesis.					
5. Pre-requirements for this course (if any)**:**					
Cell and Tissue Biology (BIO1203).					
6. Co-requirements for this course (if any)**:**					
None					
7. Course Main Objective(s):					
By the end of this course, the students should be able to: - Define various terminology of genetics. - Explain the principles of Mendelian and non-mendelian laws of Inheritance. - Solve monohybrid-cross, dihybrid-cross, and multi-hybrid cross using branch diagrams and/ or Punnett squares. - List syndromes related to genetic abnormalities. - Explain the structure of DNA and RNA, Nucleotide, Sugar and Phosphate.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	2	50%
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		
4	Distance learning		
5	**Others (Lab work)**	2	50%

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	30
2.	**Laboratory/Studio**	30
3.	**Field**	
4.	**Tutorial**	
5.	**Others (specify)**	
Total		**60**

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 Mendelian and non-mendelian laws of Inheritance.	K 1	-Lectures. -Class discussion. -Group discussion. -Case studies.	-Quizzes -Midterm examination. -Final examination. -Class discussion and participation. - Homework (Problem-solving).

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.2	Recognize structure of DNA, RNA and proteins.	K 1	-Lectures. -Class discussion. -Group discussion. -Homework assignments. -Case studies.	-Quizzes -Midterm examination. -Final examination. -Class discussion and participation. -Homework assignments.
2.0	**Skills**			
2.1	Calculate the probability of genetic crosses outcomes.	S 1	-Lectures. -Short essay -Class discussion. -Group discussion. -Brainstorming.	-Quizzes -reports -Final examination. -Class discussion and participation. - Homework (Problem-solving).
2.2	Investigate genetic abnormalities caused by changes in chromosome	S5	-Lectures. -Short essay -Class discussion. -Group discussion. -Brainstorming.	-Quizzes -reports -Final examination. -Class discussion and participation. - Homework (Problem-solving).
2.3	using genetic engineering and	S 4	-Lectures.	-Quizzes

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	recombinant DNA technology.		-Short essay -Class discussion. -Group discussion. -Brainstorming.	-reports -Final examination. -Class discussion and participation. - Homework (Problem-solving).
3.0	**Values, autonomy, and responsibility**			
3.1	Work in a team to conduct a specific project.	V1	-Short essay -Class discussion. -Group discussion.	-Class discussion and participation. -Homework (Problem-solving).

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to genetics.	2
2.	Mendelian Genetics: Mendel's first law (law of segregation) and the principle of dominance. Mendel's second law (law of independent assortment).	2
3	Mendelian Genetics: Mendel's first law (law of segregation) and the principle of dominance. Mendel's second law (law of independent assortment).	2
4	Mendelian Genetics: Co-dominance, incomplete dominance.	2
5	Genetics of Sex: Sex determination, sex- linked characters, Sex influenced, sex limited characters.	2
6	Multiple alleles & Lethal Genes. Mutations & Phenotype.	2
7	Linked Genes and Chromosome mapping, crossing over syndromes related to genetics.	2
8	Fundamentals of cytogenetic inheritance: cell cycle & significance of meiosis.	2
10	Nucleic acids: structure and function, DNA packaging into the chromosome.	2
11	Nucleic acid replication and synthesis in prokaryotes & eukaryotes.	2

12	Gene expression: Transcription	2
13	Gene expression: Translation of messenger RNA (mRNA) & Protein synthesis	2
14	Common Genetics diseases & Cancer genetics.	2
15	Population Genetics.	2
Total		**30**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Class Participation	During whole teaching period	5
2.	Homework (Problem-solving)	3 to 13	5
3.	Short Exams (Quizzes)	During whole teaching period	5
4.	Midterm Theoretical Examination	8-9	20
4.	Reports (For Practical)	During whole teaching period	10
5.	Final Practical Examination	15	15
6.	Final Theoretical Examination	17	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	- Natasha Ramroop Singh (2023). Introduction to Genetics. Thompson Rivers University. - D. Peter Snustad and Michael J. Simmons (2015): Principles of Genetics, 7th Edition. Wiley.
Supportive References	- Journal of molecular and applied Genetics - Genetica, Chromosoma
Electronic Materials	- Computers with net connection, Scientific websites.
Other Learning Materials	- Programs and CDs if available.

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	- Lecture halls, containing white boards, and electronic monitors. The seats fit the number of students - Laboratories equipped with three tables and water sources, microscopes
Technology equipment (projector, smart board, software)	- Well-equipped lab and lecture room with computers and display screens installed with curtains on the windows are required
Other equipment (depending on the nature of the specialty)	- Microscopes with drawing tube. Lens micrometer. - permanent slides for cell division stains: safranin, light, green, giemsa, Aceto-carmine and basic fuchsin teaching models.

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	- Students. - Faculty members.	Indirect & direct: - Questionnaires. - Meetings.
Effectiveness of Students assessment	- Quality and development committee. - Department chair.	- Course report. - Program annual report.
Quality of learning resources	- Plan and program committee. - Students. - Staff members.	Indirect & direct: - Questionnaires. - Meetings. - Reports.
The extent to which CLOs have been achieved	- Quality and development committee. - Peer Reviewer. - Program leaders.	Indirect & direct: - Questionnaires. - Meetings. - Reports.
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	PROGRAMS AND STUDY PLANS COMMITTEE
REFERENCE NO.	
DATE	SEPTEMBER 2023