



## Course Specifications

<b>Course Title:</b>	<b>General Genetics</b>
<b>Course Code:</b>	<b>BIO221</b>
<b>Program:</b>	<b>Bachelor of Science in Biology</b>
<b>Department:</b>	<b>Department of Biology</b>
<b>College:</b>	<b>Faculty of Science</b>
<b>Institution:</b>	<b>University of Tabuk</b>

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## A. Course Identification

<b>1. Credit hours:</b>	<b>3 (2 Theoretical + 1 Practical) hours</b>		
<b>2. Course type</b>			
a.	University <input type="checkbox"/>	College <input type="checkbox"/>	Department <input checked="" type="checkbox"/>
	Others <input type="checkbox"/>		
b.	Required <input checked="" type="checkbox"/>	Elective <input type="checkbox"/>	
<b>3. Level/year at which this course is offered:</b>	<b>Level 4/ Second semester/ Second year</b>		
<b>4. Pre-requisites for this course (if any):</b>	<b>General Biology 2 (BIO202).</b>		
<b>5. Co-requisites for this course (if any):</b>	<b>None</b>		

### 6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	2	50%
2	Blended		
3	E-learning		
4	Distance learning		
5	Laboratory	2	50%

### 7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	26
2	Laboratory/Studio	26
3	Tutorial	
4	Others (specify)	
	<b>Total</b>	<b>52</b>

## B. Course Objectives and Learning Outcomes

### 1. Course 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, co-dominance, lethal genes, crossing over, gene mapping and sex determination. It also covers topics on multiple alleles and allele types, cell cycle and mitotic division, meiotic division & 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.

### 2. Course Main Objective

By the end of this course, the students should be able to:

- Help students to become familiar with the terminology of genetics.
- Provide students with a strong background in the principles of Mendelian and non-mendelian laws of Inheritance.
- Develop students' ability to solve monohybrid-cross, dihybrid-cross, and multi-hybrid cross using branch diagrams and/ or Punnett squares.



- Introduce students to some syndromes related to genetics.
- Students will become familiar with structure of DNA and RNA, Nucleotide, Sugar and Phosphate.

### 3. Course Learning Outcomes

CLOs		Aligned PLOs
<b>1</b>	<b>Knowledge and Understanding</b>	
1.1	To describe Mendelian and non-mendelian laws of Inheritance.	K1
1.2	To recognize structure of DNA, RNA and proteins.	K2
<b>2</b>	<b>Skills:</b>	
2.1	To calculate the probability of genetic crosses outcomes.	S5
2.2	To explain genetic abnormalities caused by changes in chromosome number.	S1
2.3	To develop genetic engineering and recombinant DNA technology.	S4
<b>3</b>	<b>Values:</b>	
3.1	To work independently as a member or as a team.	V1

### C. Course Content

N o	(List of Topics (Theory Part	Contact Hours
1	Introduction to genetics.	2
2	Mendel's first law (law of segregation) and the principle of dominance.	2
3	Mendel's second law (law of independent assortment).	2
4	Mendel's second law (law of independent assortment).	2
5	Genetics of Sex: Sex determination, sex- linked characters, Sex influenced, sex limited characters.	2
6	Genetics of Sex: Sex determination, sex- linked characters, Sex influenced, sex limited characters.	2
7	Linked Genes and Chromosome mapping, crossing over syndromes related to genetics	2
	<b>Mid Term Exam</b>	
8	Linked Genes and Chromosome mapping, crossing over syndromes related to genetics.	2
9	Cell cycle and mitotic division significance of meiosis.	2
10	Nucleic acids: structure and function, DNA packaging in the chromosome.	2
11	Transcription & Translation of messenger RNA (mRNA) and Protein synthesis	2
12	Nucleic acid replication and synthesis in eukaryotes	2
13	Nucleic acid replication and synthesis in prokaryotes	2
	<b>Final Exam</b>	
<b>Total</b>		<b>26</b>



## C. Course Content

No	(List of Topics (Practical Part	Contact Hours
1	Introduction to genetics Mendel's first law.	2
2	Identification of pure and hybrid genotype (Testcross)	2
3	Mendel's second law (law of independent assortment).	4
4	Non-Mendelian inheritance incomplete dominance, CO-dominance.	4
5	Linked Genes and Chromosome mapping, crossing over.	4
6	<b>Mid Term Practical Exam</b>	
7	Genetics of Sex: Sex- linked characters.	2
8	Lethal genes	4
9	The blood group system inheritance and genetics.	2
10	Cell cycle (mitotic division)	2
	<b>Final Exam</b>	
<b>Total</b>		<b>26</b>

## D. Teaching and Assessment

### 1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
<b>1.0</b>	<b>Knowledge and Understanding</b>		
1.1	To describe Mendelian and non-mendelian laws of Inheritance.	- Lectures.	- Homework
1.2	To recognize structure of DNA, RNA and proteins.	- Lectures - Activities and homework.	- Quizzes. - Homework - Periodic exam. - Final exam.
<b>2.0</b>	<b>Skills</b>		
2.1	To calculate the probability of genetic crosses outcomes.	- Lectures - Activities and homework.	- Quizzes. - Homework - Periodic exam. - Final exam.
2.2	To explain genetic abnormalities caused by changes in chromosome number.	- Lectures - Activities and homework.	- Quizzes. - Homework - Periodic exam. - Final exam.
2.3	To develop genetic engineering and recombinant DNA technology.	- Lectures - Activities and homework.	- Quizzes. - Homework - Periodic exam. - Final exam.
<b>3.0</b>	<b>Values</b>		



3.1	To work independently as a member or as a team.	- Individual presentation or group.	- Interactive discussion and participation.
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## 2. Assessment Tasks for Students

#	*Assessment task	Week Due	Percentage of Total Assessment Score
1	Quizzes + Assignments + Class discussion	1-13	10%
2	Midterm Theoretical Exam	8	25%
3	Practical Midterm Exam	8	10%
4	Final Practical Exam	14	15%
5	Final Theoretical Exam	15	40%
6			

\*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

## E. Student Academic Counseling and Support

**Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:**

- Office hours 6 hrs./ week at least.
- Academic Guidance: about 30 students allotted to each faculty member.
- Direct supervision of staff for lab works.
- Electronic communication through black board and e-mail.

## F. Learning Resources and Facilities

### 1. Learning Resources

<b>Required Textbooks</b>	1. Gardinar.(1985).Introduction to Genetics. 2 Lewin, B. (1983). Genes. John Wiley and Sons Inc. New York
<b>Essential References Materials</b>	Genetica, Chromosoma Journal of molecular and applied Genetics
<b>Electronic Materials</b>	Computers with net connection, Scientific websites.
<b>Other Learning Materials</b>	Programs and CDs if available

### 2. Facilities Required

Item	Resources
<b>Accommodation</b> Classrooms, laboratories, demonstration) (.rooms/labs, etc	- A sufficient number of classrooms, well equipped -Practical laboratories are available to accommodate students -Virtual session provided by the blackboard (which allow discussions and sharing PowerPoint and video)
<b>Technology Resources</b>	-Data show.



AV, data show, Smart Board, software.) (.etc	-Wireless connection in the building for students and faculties.
<b>Other Resources</b> Specify, e.g. if specific laboratory equipment is required, list requirements or (attach a list	Microscopes with drawing tube. Lens micrometer permanent slides for cell division stains: safranin, light green, giemsa, Aceto-carmin and basic fuchsin teaching models.

## G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
- Effectiveness of teaching and assessment.	- Students.	Indirect - Questionnaires.
- The extent of achieving the course learning outcomes.	- Program committee. - Staff members. - Students.	Direct - Questionnaires. - Reports. - Meetings
- Quality of learning resources.	- Program leaders. - Peer Reviewer.	Direct & Indirect - Questionnaires. - Reports. - Meetings

**Evaluation areas** (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

**Evaluators** (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

**Assessment Methods** (Direct, Indirect)

## H. Specification Approval Data

<b>Council / Committee</b>	Biology Department Council
<b>Reference No.</b>	
<b>Date</b>	1/6/2022

