



Course Specifications

Course Title:	Genetics
Course Code:	4013281-3
Program:	Applied Biology
Department:	BSc Biology
College:	Faculty of Applied Science
Institution:	Umm Al-Qura University

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A. Course Identification

1. Credit hours:	3 hours
2. Course type	
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"/>
3. Level/year at which this course is offered:	2nd year/ Level 4
4. Pre-requisites for this course (if any):	Plant Biology 2
5. Co-requisites for this course (if any):	None

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom		70 %
2	Blended		
3	E-learning		10 %
4	Correspondence		10 %
5	Other		10 %

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	Lecture	30
2	Laboratory/Studio	42
3	Tutorial	6
4	Practical/Field work/Internship	6
5	Others (specify)	10
	Total	94
Other Learning Hours*		
1	Study	
2	Assignments	
3	Library	
4	Projects/Research Essays/Theses	
5	Others (specify)	
	Total	

* The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

Genetics course is designed for the students to understand genetics and modern genetics concepts, Mendel inheritance and Mendel's modification's ratio; cell; cell contents. Also, it will covered the process of mitosis and miosis, multiple alleles: types of macromolecules, blood group genetics and quantitative genetics, sex linkage genetics, detailed study of modern genetics, genetic engineering, genes, chromosomes, and gene expression.

2. Course Main Objective

- Introduce the students to genetic, mitosis and mitosis mechanism.
- Study Mendel's laws, and solve genetic problems.
- Introduce students to non-Mendelian ratio.
- Introduce students to the sex chromosome inheritance.
- Introduce student to genetic engineering.
- Giving students the ability to use the microscope.
- Giving students the collective individual skill work.
- Providing students with the skill of the using of modern technology.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge:	
1.1	Definition of genetics.	
1.2	Definition of Mendel laws.	
1.3	Definition of meiosis and mitosis.	
1.4	Sex chromosomes.	
1.5	Gene expression	
1.6	Providing students with the skill of the use of modern technology.	
2	Skills :	
2.1	Understanding the genetic basis of inheritance.	
2.2	Understanding cell cycle and transmission of genetic materials from cell to cell.	
2.3	To use computer and internet.	
2.4.	To describe the chromosomal aberrations disorders	
2.5	To identify different types of chromosomes and how to arrange them in a karyotype.	
2.6	To know differences between nuclear genome and mitochondrial genome.	
2.7	To analyze some genetic syndromes with chromosomal aberrations.	
3	Competence:	
3.1	Developing oral presentations.	
3.2	Communicating personal ideas and thoughts.	
3.3	Work independently and as part of a team to finish some assignments.	

CLOs		Aligned PLOs
3...	Communicate results of work to others.	

C. Course Content

No	List of Topics	Contact Hours
1	• Principles of genetics, and, Study the composition of the cell.	2
2	• Study the nucleic acids.	2
3	• Study the chemical composition of chromosomes.	2
4	• Study Meiosis and Mitosis division.	2
5	• Study Mendel inheritance and Mendel's modification ratio.	2
6	• Genetic crossing-over.	2
7	• Sex linkage.	2
8	• Multiple alleles.	4
9	• Quantitative genetics.	2
10	• Human blood groups.	2
11	• Mutation.	2
12	• Gene expression and Genetic engineering.	4
Total		28h

D. Teaching and Assessment

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

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge		
1.1	Definition of genetics.	In-class lecturing where the previous knowledge is linked to the current and future topics.	Homework and quizzes.
1.2	Definition of Mendel laws.	Homework assignments.	Midterm and final written exams (theoretical and practical).
1.3	Definition of meiosis and mitosis.	Discussions (connecting what they learn in the class and applying this information in laboratory).	Evaluation of reports.
1.4	Sex chromosomes.	Handout of lecture notes for each topic.	Oral presentation.
1.5	Gene expression		Course work reports.

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.6	Providing students with the skill of the use of modern technology.		
2.0	Skills		
2.1	Understanding the genetic basis of inheritance.	Application of essential scientific techniques through lectures, classes and essays.	Course work reports.
2.2	Understanding cell cycle and transmission of genetic materials from cell to cell.	Small group discussion	Evaluation of the topics prepared by students according to the content, arrangement, and covering of the topic.
2.3	To use computer and internet.	Ask the students to make small search project during the semester	Midterm and final exams.
2.4	To describe the chromosomal aberrations disorders	Making connections between different topics across the course.	Checking the homework assignments.
2.5	To identify different types of chromosomes and how to arrange them in a karyotype.	Class discussions (Engage students in interaction with questions and answers).	
2.6	To know differences between nuclear genome and mitochondrial genome.	Homework assignments	
2.7	To analyze some genetic syndromes with chromosomal aberrations.	Use of microscopic illustrations.	
3.0	Competence		
3.1	Developing oral presentations.	Engage student in carrying out internet search.	Oral exams.
3.2	Communicating personal ideas and thoughts.	The ability to debate the scientific basis of genetic makeup of body	Evaluation of student essays assignments and search work.
3.3	Work independently and as part of a team to finish some assignments.	Writing group reports	Observation of student ethical and moral behavior.
3.4	Communicate results of work to others.	Solving problems in groups during tutorial	Students' attendance is recorded during lectures.
		Checking the homework	Assessment of the student reports.

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
		assignments in groups during discussion	
		Cooperative learning and application of scientific method in thinking the scientific problem solving.	Grading homework assignments.
		Work as part of a team.	
		Conducting group experiments and writing group reports.	
		Dividing students into groups to cooperate with each other during the experiments.	

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Periodical Exam(s)	4	10%
2	Mid Term Exam (Theoretic)	8	20%
3	Mid Term Exam (practical)	9	10%
4	Reports and essay	11	5%
5	Final Practical Exam	15	15%
6	Final Exam	16	40%
7			
8			

*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 :

- Two hours office per week

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	Lewin Genes XII 2017/ Amazon. The Gene: An Intimate History (2017). Siddhartha Mukherjee, Scribner.
Essential References Materials	Gardner Book.
Electronic Materials	https://www.coursera.org/ https://www.edx.org
Other Learning Materials	Microsoft office package. Multi- media associated with the text book and the relevant websites.

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	<ul style="list-style-type: none"> Lecture hall equipped with white board and fifty seats. Provide the Laboratory with the safety equipment.
Technology Resources (AV, data show, Smart Board, software, etc.)	<ul style="list-style-type: none"> Provide a computer in every class room and lab.
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	<ul style="list-style-type: none"> Microscopes. Ready-made slides. White boards.

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Strategies for Obtaining Feedback on Effectiveness of Teaching	Students	<ul style="list-style-type: none"> Questionnaires Discuss students Midterm and final tests. Former review.
Other Strategies for Evaluation of Teaching	by the Instructor or by the Department	None
Processes for Improvement of Teaching	Instructors	<ul style="list-style-type: none"> Using images and presentations. Precision setting questions. Training students in using information technology.

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Processes for Verifying Standards of Student Achievement	Instructors/ department	After the agreement of Department and Faculty administrations.
arrangements for periodically reviewing course effectiveness	Instructors/ department	preliminary evaluation in the lecture. Evaluation test. Evaluation activities.

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

Council / Committee	
Reference No.	
Date	