Molecular Biology Course Description

1. Course Name:
Molecular Biology
2. Course Code:
MOBI435
3. Semester/ Year: Annual
Second Semester / Fourth Stage / 2023-2024
4. Date of preparation of this description
1/2/2024
5. Available Attendance Forms:
Came
6. Number of credit hours (total) / number of units (total):
2 hours theoretical / 3 hours practical (5 hours) / 3.5 units
7. Course administrator's name (if more than one name)
Assoc. Prof. Ghadeer Abdel Moneim Mohamed ghadeer_abd@uomosul.edu.iq L. Rowaida Zuhair Younis rwaida_al_agha@uomosul.edu.iq
8. Course Objectives
Thelearner should be able to describe the animal cell and identify its molecular components from the nucleus, its membrane, cytoplasm and other contents. Study the functions of cell components and organelles. differentiating between types of DNA and RNA, Identify genetic material (DNA), its components and molecular structure, distinguish between garden types and their divisions according to the type of planning Familiarity with the ways in which substances pass through the cell membrane emonstrates cell reproduction methods omprehensive study of RNA (and its types
9. Teaching and learning strategies
- Interactive Lecture - Brainstorming - Dialogue and discussion - Field Training

- Practical exercises
- Field Project
- Self-learning

10. Course Structure

The week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 Theoretical	A1: Recognize molecular biology and describe the cell and its types	An overview of the concept of molecular biology and an introduction and definition of cell description and its types	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester1 exam, final exam
	3 Practical	A1: To learn about the microscope, identify its types, the difference between microscopes, and how each type works	General information about the microscope and its types and to identify its importance in the examination of all samples that the microscope is used to detect and identify it and know the parts of the microscope through the identification and dealing with the microscope	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Practical quiz1
2	2 Theoretical	A2: Differentiates between DNA and RNA E1: contributes to the identification of the cell nucleus and its components	The nucleus and its components, nitrogenous bases and how to reproduce nucleic acids	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester1 exam, final exam
	3 Practical	A1: Introduce the student to what a cell is, what it consists of, what types of cells in the body and how they perform their functions within the body	Providing the opportunity for the student to examine with light microscopy to identify the cell and its contents, as well as to identify its types through the examined samples of cell types taken from various tissues, and to identify their functions.	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Practical quiz
3	1 Theoretical	A2: Recognizes the cytoplasm and identifies the types of cytoplasmic reticulum	Definition of cytoplasm, cytoplasm,	Interactive lecture, brainstorming, dialogue and discussion, self-	Semester1 exam, final exam

			cytoplasmic reticulum and their types and colgi bodies	learning	
	3 Practical	A2 : The student's knowledge of the types of tissues in the animal's body	The student's knowledge of the types of tissues in the animal's body	Interactive lecture, brainstorming, dialogue and discussion, field training, self-learning	Practical quiz
4	1 Theoretical	A2: Determines the role of mitochondria in energy production and familiarity with the role of lysosomes and peroxisomes	Energy production and the role of lysosomes, peroxisomes and central bodies	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester1 Exam, Final Exam, Report
	3 Practical	A3: Introducing the student to what is connective tissue, what are its types, and what is meant by muscle tissue	Introducing the student to the types of connective tissue as well as muscle tissue	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Short practical test, report
5	1 Theoretical	A1: Familiarize themselves with the ways in which substances cross the cell membrane	Methods and steps of crossing substances through the cell membrane	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester1 Exam, Final Exam, Report
	3 Practical	A5: Knowing what blood is, what is compounded and what are the types of blood cells	Introducing the student by examining blood samples with a light microscope and identifying the types of blood cells	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Semester Practical Test 1
6	1 Theoretical	A1: Defines what osmosis is and the most important benefits of the sodium-potassium pump-	Crossing materials by osmosis and explaining the benefits of sodium-potassium pump -	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Quiz, Final Quiz
	3 Practical	A1: The student knows what the cell cycle is and when interphase occurs	Introduce the student to the cell cycle by displaying slides that show the cell cycle and clarify the cell interphase,	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Practical quiz with report
7	1 Theoretical	A1: Recognizes cellular ingestion, drinking and cellular vomiting	Crossing large molecules through the cell membrane through ingestion, cellular drinking, and cellular vomiting	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester2 exam, final exam
	3 Practical	B3: Introducing the student to the concept of cell division, what it means, and how the process of division of the nucleus and cytoplasm takes place.	Explain and introduce the student to how the process of cell division, which includes the division of the nucleus as well as the division of the cytoplasm, is carried out by showing illustrative images of these divisions processes.	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, field project, self-learning	Practical quiz with report

8	1 Theoretical	A2: Efficient transport methods explained	The most important effective mobile methods	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester2 exam, final exam
	3 Practical	A1: The student knows how cells are multiplied and identify the types of cells	Introducing the student to the process of cell proliferation through light microscopy as well as slideshows that illustrate the process of cellular reproduction in the tissue	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Practical quiz with report
9	1 Theoretical	A1: Defined on energy	Stages of cellular respiration and energy production	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester2 exam, final exam
	3 Practical	A1 : The student knows how cell division is done and identify its types	After the student knows the process of reproduction of cells, it is necessary to know how this is done and what are the steps gradually for this process through the division and reproduction of all the contents of the cell, as well as the reproduction of the genetic material in it, which is the clone of DNA, RNA .	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Semester Practical Test 2
10	1 Theoretical	A1: Material-level phosphorylation	Phosphorylation at the material level	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Semester Exam2
	3 Practical	A1: Introduce the student to the phases of mitosis that occur in the cell.	The importance of introducing the student to the phase of mitosis of the cell through the presentation of explanatory posters for this process and the need for the student to know the important changes that occur to the cell in this phase.	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Practical quiz
11	1 Theoretical	A1: Identify the chemical composition of substances involved in cell structure	Types of chemicals involved in the structure of a living cell	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Final Exam
	3 Practical	A1: Introducing the student to cytosis, what it means and how it occurs	The student's knowledge and	Interactive lecture, brainstorming, dialogue	Practical quiz

			distinction of the types of divisions that occur to the cell and how the cytoplasmosis is carried out and the need to know the difference from other divisions.	and discussion, field training, practical exercises, self-learning	
12	1 Theoretical	A1: Identifies carbohydrates and glycogen types	Types of carbohydrates	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Final Exam
	3 Practical	A1 : Identify by the student when meiosis occurs and how	Knowing and realizing the student of the time that In which meiosis occurs and what changes occur in the cell.	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Practical quiz ,report
13	1 Theoretical	B2: Demonstrates cell reproduction methods	Types and methods of cell reproduction	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Final Exam
	3 Practical	A1: Introduce the student to the stages of meiosis and how it is done.	The need for the student to know the meiosis and where it starts, as well as the need to display explanatory posters for that.	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Practical quiz
14	1 Theoretical	A2: Familiarity with the phases of mitosis	Know the phases of mitosis	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Quiz, Final Quiz
	3 Practical	A4: Identify the different phases of meiosis and how those phases are formed	Introduce the student to the different phases of meiosis, how these phases are formed and when they begin.	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, self-learning	Practical quiz , report
15	1 Theoretical	A2: Meiosis Phase Familiarity	The most important phases of meiosis	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Quiz, Final Quiz
	3 Practical	A5 : Introducing the student to the second meiosis and what are its phases	The student's knowledge of the second meiosis, when it begins, what phases it goes through, what differs from previous divisions, and what changes occur to the cell.	Interactive lecture, brainstorming, dialogue and discussion, field training, practical exercises, field project, self-learning	Short practical test with report

11. Course Evaluation

t	Evaluation methods	Calendar date (week)	Grade	Relative weight %
1	Report 1	Fourth week	2.5	2.5
2	Report 2	Fifth week	2.5	2.5
3	Quiz (1)	Sixth week	2	2
4	Quiz (2)	Fourteenth week	2	2
5	Quiz (3)	Fifteenth week	1	1
6	Semester Exam (1)	Sixth week	7.5	7.5
7	Semester Exam (2)	The first week is difficult	7.5	7.5
8	Final theoretical test	Final Semester Exams	40	40
9	Practical field project	Fifteenth week	5	5
10	Field Assessment	Third and fifth week	2	2
11	Practical Quiz (1)	First week	1	1
12	Practical Quiz (2) Quiz	Fourth week	0.5	0.5
13	Practical Quiz (3) Quiz	Fourteenth week	1	1
14	Live drawings and homework	Weeks 6, 8, 9, 10, 11, 12 and 13	5.5	5.5
15	Final Practical Test	Final Semester Exams	20	20
	Total	100	100%	100%

12. Learning and Teaching Resources

quired textbooks (methodology, if any)	
n references (sources)	
Recommended books and references (scientific journals, reports…)	ere isn't any
ctronic References, Websites	ere isn't any

Theoretical Subject Teacher
Assoc. Prof. Ghadeer Abdel Moneim Mohamed

Practical Subject Teacher
Eng. Rowaida Zuhair Younis

Head Of Department

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Chairperson of the Scientific Committee