

Course Description Form

1. Course Name:	
Genetics	
2. Course Code:	
GENT212	
3. Semester / Year:	
Second Semester – spring 2023-2024	
4. Description Preparation Date:	
1/2/2024	
5. Available Attendance Forms:	
Presence	
6. Number of Credit Hours (Total) / Number of Units (Total)	
2 theoretical + 3 practical / 3.5 units	
7. Course administrator's name (mention all, if more than one name)	
Name: Muthanna Fathi Abdullah Amar Raheed Mohamed Thmer	
Email: muthanna.f.a@uomosul.edu.iq amar.raeed@ uomosul.edu.iq	
8. Course Objectives	
<p>Course Objectives</p> <p>theoretical:</p> <ul style="list-style-type: none"> - Enabling the student to understand genetics, its scientific and practical importance, and its relationship to other sciences. - Enable the student to learn about Mendel's laws, types, matings, cross-breeding, and methods for solving genetic cross-fertilization. - Enabling the student to become familiar with the types of complete sovereignty, incomplete sovereignty, co-dominance, and supra-dominance. -Enabling the student to understand the modifications of Mendelian ratios, the effect of multiple alleles, lethal factors, the inheritance of blood groups, sex determination, and sex-linked inheritance. - The student can understand the chemical and engineering basis of inheritance and understand the nature of replication and cloning of genetic material and modern techniques in genetic engineering. 	<p>practical: -Enable the student to understand the structure of the living cell and compare between animal cells and plant cells.</p> <ul style="list-style-type: none"> - Enabling students to identify chromosomes, their shapes and characteristics, as well as genes and their characteristics. -The student will be able to learn about the cell life cycle, mitosis, and meiosis. -The student can know Mendel's first and second laws - Enable the student to identify the inheritance of blood groups in humans and animals
9. Teaching and Learning Strategies	

Strategy theoretical: -Interactive lecture -Brainstorming -Dialogue and discussion -Assigning tasks and reports -Presentations of models of some modern devices and techniques in genetic engineering	practical: - Assignment to team work - Assigning tasks and reports for each experiment
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10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 Theoretical 3practical	theoretical: A1: The student learns about the development of genetics, its theories, and its scientific and practical importance. practical: A10: The student remembers the animal cell and its structure	theoretical: The development of genetics and its theories, and the definition of genetics and its branches. practical: An illustrative study of the structure of a living cell	theoretical: Audio methods, writing style on the blackboard , direct dialogue method. practical: Assigning tasks and reporting	Short exams, assignments, discussions
2	2 Theoretical 3practical	theoretical: A2: The student knows Mendel's laws and their applications in genetics. practical: A11: The student learns	theoretical: Mendel's laws and their modifications: Mendel's experiments - the first law of isolation - phenotypic type and genotype -	theoretical: Audio methods, writing style on the blackboard , direct dialogue method.	Short exams, assignments, discussions

		about chromosomes and genes	homogeneous genotype (purebred) - heterogeneous genotype (mixture) - pure strain - hybrid - symbol for genes. practical: Chromosomes and their characteristics, the latest information about chromosomes and genes	practical: Assigning tasks and reporting	
3	2 Theoretical 3practical	theoretical: C1: The student explains the purpose of test and cross pollination and the types of dominance. practical: A12: The student explains the cell cycle and its divisions	theoretical: Test pollination - cross-pollination - modifications of Mendelian ratios 1:3 - complete dominance - incomplete dominance - co-dominance and over-dominance. practical: The cell cycle and its divisions: mitosis and meiosis	theoretical: Audio methods, writing style on the blackboard , direct dialogue method. practical: Assigning tasks and reporting	Short exams, assignments, discussions
4	2 Theoretical 3practical	theoretical: A3: The student explains the effect of lethal factors on different types of organisms. practical: A13: The student lists	theoretical: Lethal factors: color trait in mice - crawling trait in chickens - similar genetic structure in humans and dominant lethal genetic	theoretical: Audio methods, writing style on the blackboard , direct dialogue method. practical:	Short exams, assignments, discussions

		Mendel's laws	factors. practical: Mendel's laws and examples, and back and test pollination	Assigning tasks and reporting	
5	2 Theoretical 3 practical	theoretical: A4: The student understands the law of free distribution and some important terms in genetics. practical: A14: The student applies exercises on the inheritance of one pair of genes	theoretical: The law of free distribution (Mendel's second law) - test hybrid multiplication - methods for solving genetic crosses - the Point Square method - the bifurcation method - the triple hybrid - hypotheses of Mendel's second law. practical: Inheritance of two pairs of genes and examples	theoretical: Audio methods, writing style on the blackboard , direct dialogue method. practical: Assigning tasks and reporting	Short exams, assignments, discussions
6	2 Theoretical 3 practical	theoretical: A5: The student finds the ratios of genotypic and phenotypic structures resulting from cross-matching of traits. practical: A15: The student applies exercises on the inheritance of two pairs of genes	theoretical: The first semester test - modifications of the Mendelian ratios of dihybrid hybrids. practical: Modifications of Mendelian ratios and examples of inheritance of two pairs of genes	theoretical: Audio methods, writing style on the blackboard , direct dialogue method. practical: Assigning tasks and reporting	Short exams, assignments, discussions
7	2 Theoretical	theoretical:	theoretical:	theoretical:	Short exams,

	3practical	C2: The student explains the type of superiority and its effect on the appearance of the resulting traits, the traits resulting from multiplication. practical: A16: The student learns about the Mendelian ratio modifications of a pair of genes	Interaction between genes: complementary factors - interaction of genes with similar effect - recurrent factors - superiority: recessive superiority - dominant superiority - dominant inhibitory genetic factor. practical: Mutations of Mendelian ratios and examples of lethal factors	Audio methods, writing style on the blackboard , direct dialogue method. practical: Assigning tasks and reporting	assignments, discussions
8	2 Theoretical 3practical	theoretical: C3: The student explains the effect of multiple alleles and the genetic and phenotypic ratios resulting from crossbreeding between different alleles. practical: A17: The student understands the Mendelian ratio mutations of two pairs of genes	theoretical: Multiple alleles and false alleles: fur color of rabbits - skin color of mice - platinum fur color of foxes. practical: Modifications of Mendelian ratios in the case of two pairs of genes	theoretical: Audio methods, writing style on the blackboard , direct dialogue method. practical: Assigning tasks and reporting	Short exams, assignments, discussions
9	2 Theoretical 3practical	theoretical: A6: The student	theoretical: Blood groups in humans and	theoretical: Audio methods,	Short exams, assignments, discussions

		<p>understands the nature of inheritance of blood groups in humans and animals as one of several alleles.</p> <p>practical: A18: The student understands sex-linked genetics</p>	<p>animals - ABO group - H antigen - M-N blood group - Histological harmony - Inheritance of Rhesus blood groups in humans - Inheritance of blood groups in animals.</p> <p>practical: Sex-linked genetics and sex chromosome systems. Sex-linked traits in humans and insects</p>	<p>writing style on the blackboard , direct dialogue method.</p> <p>practical: Assigning tasks and reporting</p>	
10	2 Theoretical 3practical	<p>theoretical: A7: The student explains the sex systems in different organisms and the stages of sexual differentiation.</p> <p>practice: A19: The student understands sex-linked and sex-influenced genetics</p>	<p>theoretical: Sex determination and sex-linked inheritance - XX-XO system - XX-XY system - ZZ-ZW system - sexual differentiation.</p> <p>practical: Sex determination and genetics associated with Sex chromosomes in humans and animals</p>	<p>theoretical: Audio methods, writing style on the blackboard , direct dialogue method.</p> <p>practical: Assigning tasks and reporting</p>	Short exams, assignments, discussions
11	2 Theoretical 3practical	<p>theoretical: A8: The student explains the phenomenon of genetic linkage and crossing over and some aspects of chiasma.</p>	<p>theoretical: Linkage and crossing over - linked genes - complete linkage - incomplete linkage - crossing over and chiasma formation -</p>	<p>theoretical: Audio methods, writing style on the blackboard , direct dialogue method.</p> <p>practical:</p>	Short exams, assignments, discussions

		practical: A20: The student understands sex-linked and sex-specific inheritance	linkage groups. practical: Determining sex, the genetics associated with it, and lethal sex-linked genes	Assigning tasks and reporting	
12	2 Theoretical 3practical	theoretical: C4: The student uses genetic maps to determine the locations of genes. practical: A21: The student learns about multiple alleles And blood groups in humans and animals, as well as the RH factor	theoretical: The cellular basis of crossing - double crossing - genetic maps - three-point test multiplication - overlap and compatibility - use of genetic maps - genomes. practical: Multiple alleles, their characteristics and examples Blood groups in humans and animals. RH factor and inheritance of blood groups in humans and animals	theoretical: Audio methods, writing style on the blackboard , direct dialogue method. practical: Assigning tasks and reporting	Short exams, assignments, discussions
13	2 Theoretical 3practical	theoretical: A9: The student learns about the nature and structure of genetic material. practical: A22: The student learns about chromosomal abnormalities, some	theoretical: The chemical and engineering basis of inheritance: genetic material - composition of genetic material - sources of change Cytoplasmic genetics.	theoretical: Audio methods, writing style on the blackboard , direct dialogue method. practical: Assigning tasks and reporting	Short exams, assignments, discussions

		syndromes, and their symptoms	practical: Chromosomal abnormalities Duane's malformation and Patau's syndrome		
14	2 Theoretical 3practical	theoretical: C5: The student enumerates the shapes of the chromosome and its parts. practical: C7: The student learns about chromosomal abnormalities Differences in the size and composition of chromosome parts and pieces	theoretical: Mutation and structure of genetic material - structure of nucleic acids (DNA and RNA) and similarities and differences between them - replication of genetic material - cloning of genetic material. practical: Chromosomal abnormalities Differences in the size and composition of chromosomal parts and pieces	theoretical: Audio methods, writing style on the blackboard , direct dialogue method. practical: Assigning tasks and reporting	Short exams, assignments, discussions
15	2 Theoretical 3practical	theoretical: C6: The student connects modern technologies with genetic engineering. practical: C8: The student remembers cytoplasmic genetics	theoretical: Genetic material and genetic engineering Scientific practical: Cytoplasmic inheritance and	theoretical: Audio methods, writing style on the blackboard , direct dialogue method. practical: Assigning tasks and reporting	Short exams, assignments, discussions

			its comparison with nuclear inheritance, maternal influence		
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11. Course Evaluation

S	Calendar methods	Calendar appointment (week)	degree	Relative weight %
1	Theoretical final report + practical experience reports	theory week 15 practical week 1-15	7 theoretical + 6 practical	13%
2	Short test (1) Quiz	Week (3)	4 theoretical + 2 practical	6%
3	Midterm Exam (theoretical and practical)	Week (10)	10 theoretical + 5 practical	15%
4	Short test Quiz (2)	Week (12)	4 theoretical + 2 practical	6%
5	Final practical test	Practical exams week	20	20%
6	Final theoretical test	theoretical exams week	40	40%
	total		100	100

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Basics of genetics
Main references (sources)	The methodological book specified by the Ministry
Recommended books and references (scientific journals, reports...)	Lectures published by Iraqi universities
Electronic References, Websites	

Theoretical subject teacher: Dr. Muthanna Fathi Abdullah

Practical subject teacher: M. Ammar Raed Muhammad Thamer

Chairman of the Scientific Committee: A. Dr. Muthanna Ahmed Muhammad Tayyib

Head of Department: A. Dr. Omar Dhiaa Muhammad



