

نموذج توصيف مقرر
Course Description Form

Name of College\Faculty :

اسم الكلية:

Name of Department:

اسم القسم العلمي:

Course Name	Principles of Genetics	اسم المقرر
Course No.	0494 – 231	رقم المقرر
No. of Credits	3	عدد الوحدات
Theoretical Hours	2	عدد الساعات النظرية
Practical Hours	3	عدد الساعات المحلّية
Course topics	مواضيع المقرر	

1. Introduction:

- Discovery of the Double Helix Launched the Recombinant DNA Era
- Genomics Grew out of Recombinant DNA Technology
- The Impact of Biotechnology

2. Mitosis and Meiosis:

- Cell Structure is Closely Tied to Genetic Function.
- Mitosis Partitions Chromosomes into Dividing Cells.
- Meiosis Reduces the Chromosome Number from Diploid to Haploid & creates genetic variation among organisms.
- Spermatogenesis and Oogenesis

3. Mendelian Genetics:

- The Monohybrid, The Dihybrid & Independent Assortment Cross
- The Trihybrid Cross Demonstrates that Mendel's Principles Apply to Inheritance of Multiple Traits.
- Extensions of Mendelian Genetics:
 - Incomplete Dominance & Codominance.
 - Multiple Alleles of a Gene may Exist in Population
 - Lethal Alleles Represent Essential Genes
 - Combinations of Two Gene Pairs Involving Two Modes of Inheritance Modify the 9:3:3:1 Ratio
 - Epistasis, Novel Phenotypes
 - X-Linkage describes Genes on the X Chromosome
 - Sex-Limited and Sex-Influenced Inheritance
 - Penetrance and Expressivity
 - Sex Determination and Sex Chromosomes:
 - Sexual Differentiation and Life Cycles.
 - The X and Y Chromosomes
 - Sex Determination in Drosophila & reptiles
 - The Lyon Hypothesis, The Mechanism of Inactivation

4. Chromosome Mutations:

- Variation in Chromosome Number and Arrangement
- Variation in the Number of Chromosomes
- Monosomy & Trisomy in Humans:
 - Down Syndrome, Patau Syndrome, Edwards Syndrome
- Polyploidy in plants including Autopolyploidy, Allopolyploidy

5. Quantitative Genetics and Multifactorial Traits:

- Quantitative Traits can be explained in Mendelian Terms
- Heritability Estimates the Genetic Contribution to Phenotypic Variability

6. Linkage, crossing over and mapping:

- Linkage versus Independent Assortment
- The Linkage ratio, chromosome mapping

7. DNA Structure, Replication and Recombination:

- Nucleic Acid Chemistry
- DNA is Reproduced by Semi conservative Replication
- DNA synthesis and Genetic control of Replication

8. Expression and Regulation of Genetic Information:

- Proteins the End Product of Gene Expression

9. Recombination DNA Technology:

- Application of Recombinant DNA Technology

Text book: (Name, Author , Year , Publisher)	عنوان الكتاب : (الاسم ، المؤلف ، سنة الطبع ، دار النشر)
Concepts of Genetics. Klug, W.S., Cummings, M.R., Spencer C.A. and Palladino, M.A. 2015. International edition. 11 th edition (latest edition). Pearson Prentice Hall. New Jersey, USA.	
References: (Name , Author , Year . Publisher)	عنوان المرجع : (الاسم ، المؤلف ، سنة الطبع ، دار النشر)
Essentials of Genetics Klug, W.S. & Cummings, M.R. 2019.10 th edition (latest edition). Pearson Prentice Hall. New Jersey, USA Introduction to Plant Biotechnology, Chawla H S, 3 rd edition, 2020,CRC Press, Taylor and Francis.	

Prerequisites				متطلبات المقرر		
	Exams	15	%	الاختبارات		



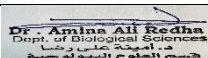
Grading	Quizzes	10	%		امتحانات قصيرة	آلية رصد المقرر
	H.W.	5	%		واجبات	
	Project (field study) LAB	30	%		مشاريع (دراسة ميدانية)	
	Final	40	%		الاختبار النهائي	
		100	%			

أهداف مخرجات المقرر :

الرقم	أهداف مخرجات المقرر :	أمثله من المقرر لتحقيق هذه الأهداف	المستوى المطلوب من عضو هيئة التدريس لتحقيق الهدف :		
			عالي	متوسط	منخفض
1					
2					
3					
4					
5					
			الحقول		
			المهارات		
			منسق المقرر (اسم عضو هيئة التدريس المشرف على توصيف المقرر ، توقيعه ، الختم و الرتبة الأكاديمية)		
			تاريخ إعداد النموذج		

Course objectives

No.	Course Objectives (Learning Outcomes)	Example(s) of relevant (Topics and activities)	Recommended Level to satisfy the objectives		
			High	Medium	Low
1	Understand the difference between sexual and asexual reproduction including alternation of generation.	Differentiate between animal and plant reproduction.	H		
2	Recite Mendel's first, second laws and Mendelian extensions. Predict the outcome of crosses.	The application of Punnett square. Apply the chi square analysis.	H		
3	Identify sex-linked characteristics and sort their transmission to	Understanding the Karyotype and how to construct it.		M	

	compare between sex-linked and sex-influenced characteristics				
4	Understand the chromosomal basis of sex determination.	understanding to predict the sex of individuals with normal and abnormal complements of sex chromosome.		M	
5	Identify the multifactorial traits.	Additive alleles the basis for the continues variation.		M	
6	How the structure of DNA relates to its function, specifically in replication and expression of genes.	Increase knowledge of genetics and molecular genetics for use in research and teaching.	M		
Fields	Plant Biology - Genetics.				
Skills					
Coordinator (Name and Rank) :	Amina Redha Associate Professor				
Signature and stamp :					
Date:	12/11/2025				