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 المحلية**
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. 11th 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. 2019.10th edition (latest edition). Pearson Prentice Hall. New Jersey, USA Introduction to Plant Biotechnology, Chawla H S, 3rd 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 :			Dr. Amina Ali Redha Dept. of Biological Sciences		
Date:			**12/11/2025**		