Course Name: General Genetics

Credit Hours: 3

Instructor: Dr. Khaldoun Al-Hadid

Office Hours: Sun:10:00-11:00, Mon.: 11:00-12:00

Email: kalhadid@ju.edu.jo

Course No.: 0304281 **First Semester: 2018/2019**

Office No.: 208

Office Phone No.: 22203

Lect.	Chap.	Topic	Pages			
No.	No.					
1-2	1	Introduction to Genetics				
		1.1. Genetics has a Rich and interesting History				
		1.2. Genetics Progressed from Mendel to DNA in Less Than a Century				
		1.3. Discovery of the Double Helix Launched the Era of Molecular Genetics				
3-4	10	DNA Structure and Analysis				
		10.1 The Genetic Material Must Exhibit Four Characteristics				
		10.6 Knowledge of Nucleic Acid Chemistry is essential to the Understanding of DNA	274-283			
		Structure				
		10.7 The Structure of DNA holds the Key to Understanding its Function				
5-12	3	Mendelian Genetics	74-87			
		3.2. The Monohybrid Cross Reveals How One Trait is Transmitted From Generation				
		to Generation				
		3.3. Mendel's Dihybrid Cross Generated a Unique F2 Ratio				
		3.4. The Trihybrid Cross Demonstrates that Mendel's Principles Apply to Inheritance				
		of Multiple Traits				
		3.5. Mendel's Work was Rediscovered in the Early Twentieth Century				
		3.8. Chi-Square Analysis Evaluates the Influence of Chance on Genetic Data	90-95			
		3.9. Pedigrees Reveal Patterns of Inheritance of Human Genetics				
13-20	4	Extensions of Mendelian Genetics	104-137			
		4.1. Alleles Alter Phenotypes in Different Ways				
		4.2. Geneticists Use a Variety of Symbols for Alleles				
		4.3. Neither Allele is Dominant in Complete or Partial, Dominance				
		4.4. In Codominance, The Influence of Both Alleles in a Heterozygote is Clearly				
		Evident				
		4.5. Multiple Alleles of a Gene May Exit in a Population				
		4.6. Lethal Alleles Represent Essential Genes				
		4.7. Combinations of Two Gene Pairs With Two Modes Of Inheritance Modify the				
		9:3:3:1 Ratio				
		4.8. Phenotypes are often Affected By More Than One Gene				
		4.9. Complementation Analysis can Determine If Two Mutations Causing a Similar				
		Phenotype are Alleles of the Same Gene				
		4.10. Expression of a Single Gene May Have Multiple Effects				
		4.11. X-Linkage Describes Genes on the X Chromosome				
		4.12. In Sex-Limited and Sex Influenced Inheritance, An Individual's Sex Influences				
		the Phenotype				
21	_	4.13. Genetic Background and the Environment may Alter Phenotypic Expression	138-141			
21	5 Chromosome Mapping in Eukaryotes					
		5.1. Genes Linked on the Same Chromosome Segregate Together				
22-26	7	Sex Determination and Sex Chromosomes	202-221			
		7.2. X and Y Chromosomes were First Linked to Sex Determination Early in the 20th				
		Century				
		7.3. The Y Chromosome Determines Maleness in Humans				
		7.4. The Ratio of Males to Females in Humans is Not 1.0				
		7.5. Dosage Compensation Prevents Excessive Expression of X-Linked Genes in				
		Humans and other Mammals				
		7.6. The Ratio of X Chromosomes to Sets of Autosomes Determines Sex in <i>Drosophila</i>				

		7.7 Temperature Variation Controls Sex Determination in Reptiles	
27-30	27-30 Chromosome Mutations: Variation in Chromosomes Number and Arrange 8.1. Variation in Chromosome Number: Terminology and Origin 8.2. Monosomy and Trisomy Result in a Variety of Phenotypic Effects 8.3. Polyploidy, In Which More than Two Haploid Sets of Chromosomes are Pris Prevalent in Plants 8.4. Variation Occurs in the Composition and Arrangement of Chromosomes 8.5. A Deletion is a Missing Region of a Chromosome 8.6. A Duplication is a Repeated Segment of a Chromosome 8.7. Inversions Rearrange the Linear Gene Sequence 8.8. Translocations Alter the Location of Chromosomal Segments in the Genon		222-247
21.22		8.9. Fragile Sites in Humans are Susceptible to Chromosome Breakage	240.264
31-32	9	 Extranuclear Inheritance 9.1. Organelle Heredity involves DNA in Chloroplasts and Mitochondria 9.2. Knowledge of Mitochondrial and Chloroplast DNA Helps Explain Organelle Heredity 9.3. Mutations in Mitochondrial DNA Cause Human Disorders 9.4. In Maternal Effect, The Maternal Genotype has a Strong Influence During Early Development 	248-264

<u>Text Book:</u>
Concepts of Genetics. Klug, Cummings, Spencer & Palladino 11th Ed. (2016).

<u>Grading Policy:</u> The lecture part counts for 70% and the laboratory part counts for 30%. The Laboratory part has a separate syllabus.

Exams	Chapters	Date	Grades	
Midterm Exam	1, 10, 3, and 4	Tuesday Nov.06.2018	30%	
Final Exam	All Chapters	To be announced	40%	