

Course Syllabus

1	Course title	Human Genetics	
2	Course number	0334282	
3	Credit hours	3	
	Contact hours (theory, practical)	3	
4	Prerequisites/corequisites	Genetics 0304281	
5	Program title	B.Sc. in Biological Sciences	
6	Program code	0304	
7	Awarding institution	University of Jordan	
8	School	Faculty of Sciences	
9	Department	Biological Sciences	
10	Course level	Senior (3ed year)	
11	Year of study and semester (s)	Second semesters 2023-2024	
12	Other department (s) involved in teaching the course		
13	Main teaching language	English / Arabic	
14	Delivery method	<input type="checkbox"/> Face to face learning <input checked="" type="checkbox"/> Blended <input type="checkbox"/> Fully online	
15	Online platforms(s)	<input checked="" type="checkbox"/> Moodle <input checked="" type="checkbox"/> Microsoft Teams <input type="checkbox"/> Skype <input type="checkbox"/> Zoom <input checked="" type="checkbox"/> Others...MS Stream	
16	Issuing/Revision Date		

17 Course Coordinator:

Name: Dr. Tareq Alhindi

Contact hours: TBA

Office number: 305

Phone number: 22236

Email: t.alhindi@ju.edu.jo

**18 Other instructors:**

Name:

Office number:

Phone number:

Email:

Contact hours:

Name:

Office number:

Phone number:

Email:

Contact hours:

19 Course Description:

As stated in the approved study plan.

This course will introduce students to human genetics; DNA structure, techniques of gene analysis, chromosome structure and cell division, immunogenetics, Cancer, genes in kindreds, somatic cell hybridization, cytogenetics, multifactorial inheritance, the human gene map, heritability, population statistics, genetic testing in individuals and populations, human biochemical disorders, gene therapy and genetic counselling.

20 Course aims and outcomes:

A- Aims:

- The laws of heredity in humans and to apply them on the study of inherited traits.
- The basics of; sex determination, the composition and function of genes, the causes and effects of mutation, population genetics, the genetics of immunity and cancer, the contribution of heredity to behavior and intelligence, basic principles of epigenetics, genetic counselling, and genetic technologies.

B- Students Learning Outcomes (SLOs):

Upon successful completion of this course, students will be able to:

- 1- Introduction to the structural organization of the human genome.
- 2- Understand the basic concepts and applications of Mendelian genetics in humans.
- 3- Understand the basic concepts and applications of Non-Mendelian genetics in humans.
- 4- Understand the basic concepts of extra nuclear Inheritance in humans.
- 5- Understand the Multifactorial and Behavioral Traits.
- 6- Understand the basic principles of epigenetics and genetic imprinting.
- 7- Allelic disorders, analyze karyotyping and chromosomal aberrations.
- 8- Population genetics principals.
- 9- Mutation, cancer genetics and genetic counseling.

SLOs SLOs of the course	SLO (1)	SLO (2)	SLO (3)	SLO (4)
1	x			
2	x			
3	x			
4	x			
5	x			
6	x			

21. Topic Outline and Schedule:

Week	Lecture	Topic	Student Learning Outcome	Learning Methods (Face to Face/Blended/ Fully Online)	Platform	Synchronous / Asynchronous Lecturing	Evaluation Methods	Resources
1	1.1	Introduction	1	Blended	MS Teams	Synchronous	Q & A	Slides / online
	1.2	The Human Genome Project	1	Blended	MS Teams	Synchronous	Q & A	Slides / online
	1.3	Molecular organization and gene content of the human genome	1	Blended	MS Teams	Asynchronous	Q & A	Slides / online
2	2.1	Comparative genomics.	1	Blended	MS Teams	Synchronous	Assignment	Slides / online
	2.2	Chromosome theory and chromosome packaging	1	Blended	MS Teams	Synchronous	Q & A	Slides / online
	2.3	Repetitive DNA in the Human genome (tandem & interspersed repeats).	1	Blended	MS Teams	Asynchronous	Q & A	Slides / online
3	3.1	ncRNA genes.	1	Blended	MS Teams	Synchronous	Q & A	Slides / online
	3.2	Cell and tissue types.	1	Blended	MS Teams	Synchronous	Reports	Slides / online
	3.3	Cell division and death (Mitosis and cell cycle)	1	Blended	MS Teams	Asynchronous	Reports	Slides / online
4	4.1	Human stem cells.	1	Blended	MS Teams	Synchronous	Assignment	Slides / online
	4.2	Human reproductive system	1	Blended	MS Teams	Synchronous	Assignment	Slides / online

	4.3	Sperm formation (spermatogenesis))Ovum formation (oogenesis).	1	Blended	MS Teams	Asynchronous	Q & A	Slides / online
5	5.1	Prenatal development	2	Blended	MS Teams	Synchronous	Q & A	Slides / online
	5.2	Birth defects	2	Blended	MS Teams	Synchronous	Q & A	Slides / online
	5.3	Maturation and aging.	2	Blended	MS Teams		Q & A	Slides / online
6	6.1	Single-gene inheritance	2	Blended	MS Teams	Synchronous	Q & A	Slides / online
	6.2	Following the inheritance of more than one gene	2	Blended	MS Teams	Synchronous	Q & A	Slides / online
	6.3	Pedigree analysis	2	Blended	MS Teams	Asynchronous	Quiz	Slides / online
7	7.1	Alterations of expected Mendelian ratios	3	Blended	MS Teams	Synchronous	Quiz	Slides / online
	7.2	Linked traits inheritance	3	Blended	MS Teams	Synchronous	Q & A	Slides / online
	7.3	Mitochondrial genes	3	Blended	MS Teams	Asynchronous	Q & A	Slides / online
8	8.1	Anatomy of the X and Y chromosomes	3	Blended	Moodle	Synchronous	Q & A	Slides / online
	8.2	Traits inherited on sex chromosomes	3	Blended	MS Teams	Asynchronous	Q & A	Slides / online
	8.3	Sex-limited and sex-influenced traits	3	Blended	MS Teams	Asynchronous	Q & A	Slides / online
9	9.1	X inactivation	3	Blended	MS Teams	Synchronous	Q & A	Slides / online

	9.2	Genes and the environment-mold traits	4	Blended	MS Teams	Asynchronous	Report	Slides / online
	9.3	Polygenic traits and methods to investigate multifactorial traits	4,5	Blended	MS Teams	Asynchronous	Q & A	Slides / online
10	10.1	Genetics of behaviour (intelligence, drug addiction, mood disorders & autism).	5	Blended	MS Teams	Synchronous	Q & A	Slides / online
	10.2	From DNA to protein and posttranslational modifications	6	Blended	MS Teams	Asynchronous	Assignment	Slides / online
	10.3	Control of gene expression	6	Blended	MS Teams	Asynchronous	Assignment	Slides / online
11	11.1	Epigenetics in humans	6	Blended	MS Teams	Synchronous	Assignment	Slides / online
	11.2	Mutation and polymorphism	7	Blended	MS Teams	Asynchronous	Assignment	Slides / online
	11.3	Allelic disorders	7	Blended	MS Teams	Asynchronous	Q & A	Slides / online
12	12.1	Types of mutations & DNA repair	7	Blended	MS Teams	Synchronous	Q & A	Slides / online
	12.2	Portrait of a chromosome Karyotyping	7	Blended	MS Teams	Asynchronous	Q & A	Slides / online
	12.3	Atypical chromosome number	7	Blended	MS Teams	Asynchronous	Q & A	Slides / online

13	13.1	Atypical chromosome structure	7	Blended	MS Teams	Synchronous	Q & A	Slides / online
	13.2	Uniparental disomy	7	Blended	MS Teams	Asynchronous	Q & A	Slides / online
	13.3	Gene pool	8	Blended	MS Teams	Asynchronous	Q & A	Slides / online
14	14.1	Hardy-Weinberg equation	8	Blended	MS Teams	Synchronous	Homework	Slides / online
	14.2	Changing allele frequencies	8	Blended	MS Teams	Asynchronous	Homework	Slides / online
	14.3	Statistical genetics	8	Blended	MS Teams	Asynchronous	Q & A	Slides / online
15	15.1	Cancer genes and genomes.	9	Blended	MS Teams	Synchronous	Reports	Slides / online
	15.2	Modifying DNA (gene silencing and genome editing).	9	Blended	MS Teams	Asynchronous	Reports	Slides / online
	15.3	Genetic counselling & personal genome sequencing. Treating genetic disease	9	Blended	MS Teams	Asynchronous	Reports	Slides / online



22 Evaluation Methods:

Opportunities to demonstrate achievement of the SLOs are provided through the following assessment methods and requirements:

Evaluation Activity	Mark	Topic(s)	SLOs	Period (Week)	Platform
Midterm Exam	30	TBA	1-3	7	Written
Assignments and Quizzes	20	TBA	1-9	TBA	Written
Final Exam	50	TBA	1-9	TBA	Written

23 Course Requirements

A PC or new smartphone with MS Teams installed and an adequate internet connection; a suitable internet browser to open the Moodle webpage E-learning and JU Exams, and to access Facebook to follow course group

24 Course Policies:

A- Attendance policies:

Enrolled students are expected to attend the lectures in line with the university of Jordan policy as outlined in the JU student handbook. Failure to do so will make the student subject to the penalties outlined in the said document. Furthermore, missing classes will have negative repercussions on the student's participation grade.

B- Absences from exams and submitting assignments on time:

You should talk to your instructor as soon as possible if you miss an exam. All such cases will be dealt with according to the UJ student handbook rules.

C- Health and safety procedures:

To be announced during laboratory introduction as explained in the laboratory manual.

D- Honesty policy regarding cheating, plagiarism, misbehavior:

All violations pertaining to cheating, plagiarism and misbehavior will be dealt with in accordance to the rules outlined in the UJ student handbook. In order to avoid plagiarism, the sources for the information contained in your homework must be properly cited and verbatim quotations must be



limited and explicitly presented as such. To learn more about the procedures for ethical referencing of information and how to assess the credibility of information critically you can consult with the relevant documents in the course UJ e-learning page (see below).

E- Grading policy:

Evaluation	Points %	Date
Midterm Exam	30%	TBA
Assignments and Quizzes	20%	TBA
Final Exam	50%	TBA

F- Available university services that support achievement in the course:

Moodle course page at University of Jordan e-learning portal: <https://elearning.ju.edu.jo/>

25 References:

A- Required book(s), assigned reading and audio-visuals:

1. Lewis, Ricki. (2015). Human genetics: Concepts and applications (11th ed). ISBN 978-0-07-352536-5.
2. Tobias, Edward. et.al. (2011). Essential Medical Genetics (6th ed). ISBN: 9781405169745.

B- Recommended books, materials, and media:

Articles, Videos and other material will be provided to students through the online portal (E-Learning) and the course group on Facebook.

26 Additional information:



Name of Course Coordinator: --Dr. Tareq Alhindi-----Signature: ----- Date: ----- -
Head of Curriculum Committee/Department: ----- Signature: ----- ---
Head of Department: ----- Signature: ----- -
Head of Curriculum Committee/Faculty: ----- Signature: ----- -
Dean: ----- Signature: -----