



مركز الاعتماد  
وإضمان الجودة  
ACCREDITATION & QUALITY ASSURANCE CENTER



**The University of Jordan**

**Accreditation & Quality Assurance Center**

**Course Syllabus**

**Course Name:**

1	Course title	Principles of Genetics and molecular biology
2	Course number	0501217
3	Credit hours (theory, practical)	3
	Contact hours (theory, practical)	3
4	Prerequisites/corequisites	General Biology, general chemistry and organic chemistry
5	Program title	Medicine
6	Program code	
7	Awarding institution	The University of Jordan
8	Faculty	Medicine
9	Department	Physiology and Biochemistry
10	Level of course	Second level
11	Year of study and semester (s)	Second year, second semester
12	Final Qualification	
13	Other department (s) involved in teaching the course	Department of Pathology and Microbiology and Forensic Medicine
14	Language of Instruction	English
15	Date of production/revision	2022/2023

**16. Course Coordinator:**

*Office numbers, office hours, phone numbers, and email addresses should be listed.*

Dr. Mamoun Ahram  
 School of Medicine, First floor  
 962-6-535-5000 (ext. 23481)  
[m.ahram@ju.edu.jo](mailto:m.ahram@ju.edu.jo), [Dr.Ahram@gmail.com](mailto:Dr.Ahram@gmail.com)

**17. Other instructors:**

*Office numbers, office hours, phone numbers, and email addresses should be listed.*

Prof. Hatem El-Shanti  
 Prof. Said Ismail  
 Dr. Nafez Abu Tarboush  
 Dr. Diala Abu Hassan  
 Dr. Bilal Azab

**18. Course Description:**

*As stated in the approved study plan.*

This is a three-credit hour course mandatory for second-year medical students. The course is designed to introduce medical students to the basics of cellular and molecular biology and medical genetics. The basics include the study of cell structure and the function of cell components, , the chemical structure of the genetic material, molecular processes such as replication, transcription, and translation, in addition to the study of basic molecular biology tools and techniques. The course also introduces students to the main principles of medical

genetics in relation to chromosomal structure and anomalies, patterns of inheritance, and genetic disorders.

### 19. Course aims and outcomes:

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### 20. Topic Outline and Schedule:

Topic	Week	Instructor	Achieved ILOs	Evaluation Methods	Reference
Introduction into basic cell structure, model systems of cell biology, and eukaryotic cell organelles	1	Abu Hassan	A1-2		Cooper, Ch.1 (pp. 17-38) and Ch.2 (43-57)
Biomembranes and membrane proteins and their role in plasma membrane transport	1	Abu Hassan	A3-6		Cooper, Ch. 2 (pp. 58-64) Ch. 13 (515-543)
Protein sorting and transport, and endoplasmic reticulum	1	Abu Hassan	A7-8		Cooper, Ch. 10 (373-398)
The Golgi apparatus and vesicular transport	2	Abu Hassan	A9-10		Cooper, Ch. 10 (398-412)
Lysosome, endocytosis, endocytosis, and lysosomal storage diseases	2	Abu Hassan	A11-13		Cooper, Ch. 10 (412-416) Ch. 13 (544-553)
Mitochondria and peroxisomes	2	Abu Hassan	A14-16		Cooper, Ch. 10 (421-431, 450-455)
The nucleus	3	Abu Hassan	A17-18		Cooper, Ch. 9 (345-365)
The actin cytoskeleton and cell movement	3	Abu Hassan	A19-20		Cooper, Ch. 12 (459-482)
Microtubules and intermediate filaments	3	Abu Hassan	A21-23		Cooper, Ch. 12 (482-510)
The extracellular matrix	4	Abu Hassan	A24-27		Cooper, Ch. 14 (564-582)
Cell signaling	4	Abu Hassan	A28		Cooper, Ch. 15 (589-634)
The cell cycle	4	Abu Hassan	A29		Cooper, Ch. 16 (641-675)

Cell proliferation, differentiation, and death, and cancer	5	Abu Hassan	A30-31		Cooper, Ch. 17 (681-692) Cooper, Ch. 18 (713-723)
Nucleic acid structure	5	Ahram	A32		Marks, Ch. 12
Gel electrophoresis and Southern blotting	6	Ahram	A33		Marks, Ch. 17
Restriction endonucleases, RFLP, recombinant DNA technology, and DNA coning	6	Ahram	A34		Marks, Ch. 17
DNA mutations and repair	6	Ahram	A35-36		Marks, Ch. 13 and 15
DNA replication	7	Ahram	A37		Marks, Ch. 13
PCR and DNA sequencing	7	Ahram	A38		Marks, Ch. 17
The human genome	7	Ahram	A39		Marks, Ch. 12, 17
RNA transcription	9	Ahram	A40		Marks, Ch. 14
Regulation of transcription in prokaryotes and eukaryotes	9-10	Ahram	A41		Marks, Ch. 16
Analysis of gene expression	10	Ahram	A42		Marks, Ch. 17
Translation and its regulation	10	Ahram	A43		Marks, Ch. 15
Cancer: a Molecular perspective	11	Ahram	A44		Marks, Ch. 18
Structure & function of chromosomes	11	Azab	A45		
Chromosomal aberrations	11-12	Azab	A46		
Congenital anomalies	12	Azab	A47		
Patterns of single-gene inheritance	12-13	Azab	A48-50		
Non-Mendelian inheritance	13	Azab	A51-52		
Multifactorial inheritance	14	Azab	A53		
Population genetics	14	Azab	A54-55		
Biochemical genetics: disorders of metabolism	15	El-Shanti	A57		
Precision medicine	15	El-Shanti	A58-59		

**21. Teaching Methods and Assignments:**

Development of ILOs is promoted through the following teaching and learning methods:

Lectures 90%)

Homework and assignments (10%)

**22. Evaluation Methods and Course Requirements:**

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

Mid-term exam: 40%

Assignments: 10%

Final exam: 50%

**23. Course Policies:**

A- Attendance policies:

Attendance is mandatory

B- Absences from exams and handing in assignments on time:

Make-up exam is given if absence is accepted by the deanship

C- Health and safety procedures:

None

D- Honesty policy regarding cheating, plagiarism, misbehavior:

Misbehavior is not permitted and is subjected to punishment according to university laws and regulations

E- Grading policy:

Exams are scored electronically

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

Lecture halls, computers, and datashows are provided

**24. Required equipment:**

Computers and datashows

**25. References:**

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

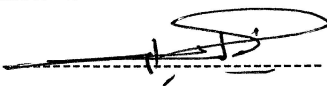
1. The Cell: A Molecular Approach, Geoffrey M. Cooper and Robert E. Hausmann, 6th edition, Sinauer Associates, 2013.

2. Mark's Basic Medical Biochemistry, Smith, Marks and Lieberman, Lippincott, Williams and Wilkins, 2009.
3. Emrey's Elements of Medical Genetics, Muller & Young, Churchill Livingstone, 13th edition, 2011.

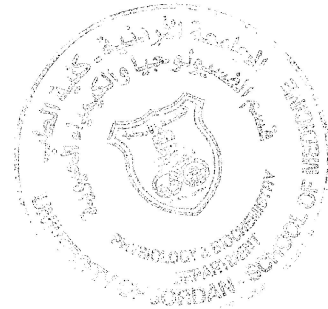
B- Recommended books, materials, and media:

1. Molecular Biology, Robert F. Weaver, 2<sup>nd</sup> edition, McGraw Hill 2002.
2. Genes VII, Benjamin Lewin, edition 1, Oxford Univ. Press, 2000.
3. Medical Genetics, Jorde, Carey, Bamshad, White, Mosby. 4<sup>th</sup> edition, Mosby, 2009.

**26. Additional information:**

Name of Course Coordinator: -----Signature: ----- Date: ----- Head  
of curriculum committee/Department: ----- Signature: -----  
Head of Department: ----- Signature: -----  
Head of curriculum committee/Faculty: *د. نبال سنان* Signature:  -----  
Dean: -----Signature: -----

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Course File



*2022, 2023*