



The University of Jordan

Accreditation & Quality Assurance Center

COURSE Syllabus

1	Course title	Genetics
2	Course number	5501322
3	Credit hours (theory, practical)	3
	Contact hours (theory, practical)	3
4	Prerequisites/corequisites	General Biology (2) 5501102
5	Program title	Bachelor in Biological Sciences
6	Program code	5503
7	Awarding institution	The University of Jordan-Aqaba
8	Faculty	Marine Sciences
9	Department	Biology
10	Level of course	Second year
11	Year of study and semester (s)	Second semester 2016/2017
12	Final Qualification	BSc.
13	Other department (s) involved in teaching the course	non
14	Language of Instruction	English
15	Date of production/revision	2/2017

16. Course Coordinator:

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

** Instructor : Majduleen Sbaihat.

** E-mail: m.sbaihat@ju.edu.jo

** Office hours: (Sun, Tues., Thurs.) → 09:00 -10:00 AM & 11:00 – 12:00 PM

** Office #: Faculty of Marine Sciences – Room # 1

** Phone Numbers : 032090450 Ext. 35079

17. Other instructors:

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

18. Course Description:

As stated in the approved study plan.

The course is designed to cover the basic principles of classical and molecular genetics. Model systems for genetic analysis such as *Drosophila melanogaster* will be covered. The course covers a detailed description of the structure and function of nucleic acids. This include; replication of DNA and regulation with emphasis on genetic diseases, mutations, and genetic engineering and its applications will be emphasized.

**19. Course aims and .1
outcomes:**

A- Aims:**Upon successful completion of this course, students will be able to:**

- 1- Distinguish between the following terms: somatic cell and gamete; autosome and sex chromosomes; haploid and diploid.
- 2- Describe the events that characterize each phase of meiosis.
- 3- Describe three events that occur during meiosis I but not mitosis.
- 4- Name and explain the three events that contribute to genetic variation in sexually reproducing organisms.
- 5- Should know the Gregor Mendel's Discoveries: Mendel brought an experimental and quantitative approach to genetics.
- 6- Define the law of segregation; the two alleles for a character are separated during the formation of gametes.
- 7- Define the law of independent assortment, each pair of allele's segregates independently into gametes.
- 8- Should know the laws of probability govern Mendelian inheritance.
- 9- Should know the Mendelian Inheritance in Humans, include: 1- Pedigree analysis reveals Mendelian patterns in human inheritance. 2- Many human disorders follow Mendelian patterns of inheritance. 3- Technology is providing new tools for genetic testing and counselling.
- 10- Describe the contributions of the following people: Griffith; Avery, McCarty, and MacLeod; Hershey and Chase; Chargaff; Watson and Crick; Franklin; Meselson and Stahl.
- 11- Describe the structure of DNA.
- 12- Describe the process of DNA replication; include the following terms: antiparallel structure, DNA polymerase, leading strand, lagging strand, Okazaki fragments, DNA ligase, primer, primase, helicase, topoisomerase, single-strand binding proteins.
- 13- Describe the function of telomeres.
- 14- Compare a bacterial chromosome and a eukaryotic chromosome.
- 15- Describe the contributions made by Garrod, Beadle, and Tatum to our understanding of the relationship between genes and enzymes.
- 16- Briefly explain how information flows from gene to protein.
- 17- Compare transcription and translation in bacteria and eukaryotes.
- 18- Explain what it means to say that the genetic code is redundant and unambiguous.
- 19- Include the following terms in a description of transcription: mRNA, RNA polymerase, the promoter, the terminator, the transcription unit, initiation, elongation, termination, and introns.
- 20- Include the following terms in a description of translation: tRNA, wobble, ribosomes, initiation, elongation, and termination.

B- Intended Learning Outcomes (ILOs): Upon successful completion of this course students will be able to ...**Learning outcomes:****• Knowledge and understanding**

At the end of this module, students will be able to:

- 3| Define the cell as a unit of structure and function of all living organisms. It includes: Cell theory, Modern Cell Biology.
- 2- Identify the chemistry of the cell, include: characteristics of carbon, characteristics of water, selectively permeable membranes, synthesis by polymerization of small molecules and self

1- Distinguish between the following terms: somatic cell and gamete; autosome and sex chromosomes; haploid and diploid.
2- Describe the events that characterize each phase of meiosis.
3- Describe three events that occur during meiosis I but not mitosis.
4- Name and explain the three events that contribute to genetic variation in sexually reproducing organisms.
5- Should know the Gregor Mendel's Discoveries: Mendel brought an experimental and quantitative approach to genetics.
6- Define the law of segregation; the two alleles for a character are separated during the formation of gametes.
7- Define the law of independent assortment, each pair of allele's segregates independently into gametes.
8- Should know the laws of probability govern Mendelian inheritance.
9- Should know the Mendelian Inheritance in Humans, include: 1- Pedigree analysis reveals Mendelian patterns in human inheritance. 2- Many human disorders follow Mendelian patterns of inheritance. 3- Technology is providing new tools for genetic testing and counselling.
10- Describe the contributions of the following people: Griffith; Avery, McCarty, and MacLeod; Hershey and Chase; Chargaff; Watson and Crick; Franklin; Meselson and Stahl.
11- Describe the structure of DNA.
12- Describe the process of DNA replication; include the following terms: antiparallel structure, DNA polymerase, leading strand, lagging strand, Okazaki fragments, DNA ligase, primer, primase, helicase, topoisomerase, single-strand binding proteins.
13- Describe the function of telomeres.
14- Compare a bacterial chromosome and a eukaryotic chromosome.
15- Describe the contributions made by Garrod, Beadle, and Tatum to our understanding of the relationship between genes and enzymes.
16- Briefly explain how information flows from gene to protein.
17- Compare transcription and translation in bacteria and eukaryotes.
18- Explain what it means to say that the genetic code is redundant and unambiguous.
19- Include the following terms in a description of transcription: mRNA, RNA polymerase, the promoter, the terminator, the transcription unit, initiation, elongation, termination, and introns.
20- Include the following terms in a description of translation: tRNA, wobble, ribosomes, initiation, elongation, and termination.

--

20. Topic Outline and Schedule:

Chapter	Weeks	Topic
13	30 Jan. – 8 Feb.	Meiosis and Sexual Life Cycles
14	13 Feb. – 22 Feb.	Mendel and the Gene Idea
15	27 Feb. – 8 Mar.	The Chromosomal Basis of Inheritance
16	13 Mar. – 22 Mar.	The Molecular Basis of Inheritance
MIDTERM EXAM: 12/3/2017 – 30/3/2017		
17	27 Mar. – 5 Apr.	From Gene to Protein
18	10 Apr. – 17 Apr.	Regulation of Gene Expression
19	19 Apr. – 24 Apr.	Viruses
20	26 Apr. – 1 May.	Biotechnology
21	3 May. – 8 May.	Genome and Their Evolution
FINAL EXAM: 11/5/2017 – 20/5/2017		

21. Teaching Methods and Assignments:

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

- Power point lectures, questions and discussions, videos, home works.
- Assignments such as preparing of reports on topics related to the subject.
- Students are requested to present a power point presentation on a subject of his/her choice within the framework of the study material.
- Quizzes and evaluation of students.

22. Evaluation Methods and Course Requirements:

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

Quizzes
Home work / Assignments.
Attendance and Participation in the class
Mid Exam
Final Exam

23. Course Policies:

A- Attendance policies:

A- Attendance policies:

- 1- I strongly recommend you attend every lecture. Missing any lecture will put you at a distinct disadvantage when test taken.
- 2- Any student with four or more unexcused absences from lecture can be legally dropped from the course.

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

The only valid excuses for missing an exam are: death in the family, illness, or accident. In this case you must provide evidence of some kind and you must report me within 3 days.

C- Health and safety procedures:

Students who miss the exam due to illness or other excuse must notify me within the first week after the exam, so make up arrangements can be Made.

D- Honesty policy regarding cheating, plagiarism, misbehavior:

1. Students are not expected to talk in class while the instructor is lecturing
2. After two warning of talking or any other classroom disruption, the Student will be automatically removed from the class.
3. Any act of cheating, or academic misconduct is subject to penalties.
4. The minimum penalty for any students caught cheating will receive a zero on that test.

E- Grading policy:

Type	Grading
Quizzes	10%
Home work / Assignments.	5%
Attendance/participation	5%
Midterm exam:	30%
Final Exam:	50%
Total	100%

Exams: The examinations will consist of any combination of Multiple choice, short answer, fill in the blank, matching, identification of figures or essay questions.

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

Library sources are available, internet, laboratory facilities.

Empty rectangular box

24. Required equipment:

- 1. Lab top
- 2. Data show
- 3. white board

25. References:

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

Textbook: Gardner, E.J., Simmons, M. J., and Snustad, D. P. PRINCIPLES OF GENETICS. New York, John Wiley & Sons, Ltd. 1998.

Supplementary reading: Campbell Biology Book, Eight Edition

NOTE: You need to buy the book to get the **Access Code** on your own textbook to register.

B- Recommended books, materials, and media:

26. Additional information:

Empty rectangular box

Name of Course Coordinator: **Ins. Majduleen Sbaih** Signature: ----- Date: **07/02/2017**

Head of curriculum committee/Department: ----- Signature: -----

Head of Department: ----- Signature: -----

Head of curriculum committee/Faculty: ----- Signature: -----

Dean: ----- -Signature: -----

Copy to:
 Head of Department
 Assistant Dean for Quality Assurance
 Course File