



The University of Jordan

Accreditation & Quality Assurance Center

COURSE Syllabus

1	Course title	Advanced Microbiology
2	Course number	0304741
3	Credit hours (theory, practical)	3 credit hours (3 hrs theory)
	Contact hours (theory, practical)	Theory: 3 hrs weekly
4	Prerequisites/co-requisites	General Microbiology 0304341
5	Program title	M.Sc. in Biological Sciences
6	Program code	04
7	Awarding institution	The University of Jordan
8	Faculty	Faculty of Science
9	Department	Department of Biological Sciences
10	Level of course	
11	Year of study and semester(s)	2021/2022, First Semester
12	Final Qualification	M.Sc.
13	Other department(s) involved in teaching the course	None
14	Language of Instruction	English
15	Date of production/revision	05/10/2021

16. Course Coordinator:

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

Prof. Hesham Al-Younes

Office no.: 032 Biology

Office hours: 10-11 Sunday, 11-12:30 Monday and 8-9 Thursday

Phone no./Ext.: 22201

E-mail: alyounes@ju.edu.jo

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.

This course investigates Cell Structure of Prokaryotes, Cytoplasmic Membrane and Transport, Cell Walls, Specialized Internal and External Structures of Prokaryotes, Protein Export and Secretion, Metabolism and Physiology, Nutrition and Growth, Genetics, Microbial evolution and Taxonomy, Environmental and Applied Microbiology.

19. Course aims and outcomes:

A- Aims:

To discuss many aspects of microbiology and deepen knowledge of microbiology & the classification and characteristics of microorganisms, in addition to microbial biology, growth, metabolism and genetics.

B- Intended Learning Outcomes (ILOs):

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

1. Understand the structure and function, physiology, and diversity of bacteria and Archaea
2. Have a basic understanding of the genetics and microbial evolution of prokaryotes
3. Explain the role of prokaryotes in our environment.

20. Topic Outline and Schedule:**Theory part**

Week No.	Topic
1-4	- In-depth insight into the organization, structure and function of bacteria
5	- Archaea: Cell morphology Cell organization and structures
6	- Prokaryotic locomotion: Flagellar movement Axial filaments Movement of flagella-lacking prokaryotes
7	- Microbial evolution: Phylogenetic trees Analytical methods for evolutionary analysis
8	- Microbial systematics: Methods for phenotypic and genotypic analyses
9	- Microbial nutrition: Nutritional types (diversity) of microorganisms Nutrient uptake (Membrane transport)
10-11	- Bacterial genome replication and gene expression:

DNA structure
 DNA replication in bacteria
 The structure of genes
 Transcription
 The genetic code
 Translation
 Protein maturation, translocation and secretion

Time remaining will be dedicated to student presentations.

SUGGESTED TOPICS for the PRESENTATION and TERM PAPER

Topics may focus on prokaryotic motility and diversity, nutrition and growth, metabolism and physiology. Other subjects related to cellular microbiology and infection biology (pathogenesis and virulence factors) may also serve as interesting material for presentations and reviews. Topics of presentations that will shed some light on modern scientific experimental approaches should have the highest priority. Titles have to be decided after discussion with the instructor before the end of the first month of the semester.

21. Teaching Methods and Assignments:

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

1. Lecturing and discussions throughout the semester
2. Exams
3. PowerPoint presentation and movies
4. Preparing term papers
5. Presentations of scientific research
6. Office hours

22. Evaluation Methods and Course Requirements:

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

The grade is distributed as follows:

Description	Weight
<i>Theory midterm exam</i>	<i>30%</i>
<i>Term paper</i>	<i>10%</i>

<i>Presentation</i>	10%	
<i>Final theory exam</i>	50%	

23. Course Policies:

A- Attendance policies:

Absence from lectures should not exceed 15%. Students who exceed the 15% limit without a medical or emergency excuse acceptable to and approved by the Dean of the relevant college/faculty shall not be allowed to take the final examination and shall receive a mark of zero for the course.

B- Absences from exams:

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 rules outlined in your student handbook.

C- Health and safety procedures:

D- Honesty policy regarding cheating, plagiarism, misbehaviour:

All violations pertaining to cheating, plagiarism, misbehaviour will be dealt with in accordance to the rules outlined in your student handbook.

E- Grading policy:

Exams may include the following question forms: multiple choice questions, True or False questions, matching questions, drawings and labelling questions, essay questions, and "fill in the blank" questions.

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

24. Required equipment:

Overhead projectors

Data show projectors

25. References:

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

COURSE BOOK and references:

- Bacterial Physiology and Metabolism. 2008. B. H. Kim and G. M. Gadd. Cambridge University Press, Cambridge, UK.
- Brock Biology of Microorganisms. 2012. M. Madigan, J. Martinko, D. Stahl and D. Clark. 13th Edition. Pearson Publishers, San Francisco, USA.

- Microbiology: An Introduction. 2013. G. J. Tortora, B. R. Funke and C. L. Case. 11th Edition. Pearson Publishers., San Francisco, USA.
- Microbiology: A System Approach. 2009. M. K. Cowan and K. P. Talaro. 2nd Edition. McGraw-Hill Publishers, New York, USA.
- Prescott's Microbiology. 2019. J. M. Willey, K. M. Sandman and D. H. Wood. 11th Edition. McGraw-Hill Publishers, New York, USA.

B- Recommended books, materials, and media:

26. Additional information:

None

Name of Course Instructor: Prof. **Hesham Al-Younes** Signature: -----Date: **05/10/2021**

Head of curriculum committee/Department: **Dr. Mohammad Abu-Baker** Signature: -----

Head of Department: **Dr. Mohammad Abu-Baker** Signature: -----

Head of curriculum committee/Faculty: Prof. Ahmad Zghoul Signature: -----

Dean: **Prof. Nidal Irshaidat** Signature: -----

Copy to:

Head of Department
Assistant Dean for Quality Assurance
Course File