مركز الاعتماد وضمان الجودة
ACCREDITATION & QUALITY ASSURANCE CENTER

Course Syllabus

1	**Course title**	Microbial Ecology
2	**Course number**	0354742
3	**Credit hours**	3
	Contact hours (theory, practical)	(3,0)
4	**Prerequisites/corequisites**	-
5	**Program title**	Master of Biological Sciences \ Thesis Track
6	**Program code**	3047
7	**Awarding institution**	The University of Jordan
8	**School**	Science
9	**Department**	Biological Sciences
10	**Course level**	Graduate
11	**Year of study and semester (s)**	2023/2024 Fall
12	**Other department (s) involved in teaching the course**	
13	**Main teaching language**	English
14	**Delivery method**	☒Face to face learning ☐Blended ☐Fully online
15	**Online platforms(s)**	☒Moodle ☐Microsoft Teams ☐Skype ☐Zoom ☐Others……
16	**Issuing/Revision Date**	9 Oct 2023

17 Course Coordinator:

Name: **Dr. Mamoon Al-Rshaidat** **Contact hours**: By appointment

Office number: Biological Sciences Building, Room # 314

Phone number: 22221

Email: m.rshaidat@ju.edu.jo

18 Other instructors:

N/A

19 Course Description:

The course will cover, microbes of soil and aquatic environments. Commensalisms between microorganisms. Microbes in extreme environments such as thermophiles, acidophiles, alkalophiles, halophiles and barophiles. The course will discuss the effect of starvation, radiation, and environmental pressure on microorganisms. Moreover, the course will cover the role of microorganisms in environmental pollution and its prevention.

20 Course aims and outcomes:

A- Aims:

The course aims at:

The course will provide students with a better understanding of the following:

1. Prokaryotic cell composition.
2. Composition and function of the microbial communities and the interaction among them.
3. Microbial community shift in response to environmental variables and habitats
4. Relating microbial community structure to habitats and how microbial community act as good indicators to environmental changes
5. Environmental changes and their role in influencing microbial activities; and microbial potential in remediation and other environmental and industrial biotechnological applications
6. Degradation of pollutants (petroleum, aromatic compounds, heavy and radioactive elements etc.)
7. Nitrogen, Iron and sulfur cycles in ecosystems
8. Bioremediation of material in the built environment

B- Students Learning Outcomes (SLOs):

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

SLOs / SLOs of the course	SLO (1)	SLO (2)	SLO (3)	SLO (4)
(1) Describe the role of different microbial structures in the microbial life				
(2) Demonstrate knwledge about the advantage of being small in bacterial adaptation to environmental conditions				
(3) Describe optimization of the microbial activities by adjusting the environmental variables on surface or subsurface				
(4) Demonstrate knowledge about microbial activities and their important roles in mobilizing and accumulating toxic metals and pathogens				
(5) Demonstrate knowledge about degradation of the organic compounds both aerobic and anaerobic and the co-metabolism concept				
(6) Describe the role of microbes in cleaning polluted sites, and in climate change				

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	**Course Introduction**		Face to Face	-	-	Exam/ Assignment	-
	1.2			-	-	-	-	-
	1.3			-	-	-	-	-
2	2.1	Taking the Measure of Microbial Ecosystems	3	-	-	-	-	Ch 19
	2.2			-	-	-	-	
	2.3			-	-	-	-	
3	3.1	How to search for literature?		-	-	-	-	
	3.2	-		-	-	-	-	
	3.3			-	-	-	-	
4	4.1	Microbial Ecosystems	1, 2, 5	-	-	-	-	Ch 20
	4.2			-	-	-	-	
	4.3			-	-	-	-	
5	5.1	Continue		-	-	-	-	
	5.2			-	-	-	-	
	5.3			-	-	-	-	
6	6.1	Microbiology of the Built Environment	1, 2, 3, 6	-	-	-	-	Ch 21
	6.2			-	-	-	-	
	6.3			-	-	-	-	
7	7.1	**Review and Midterm Exams week**		-	-	-	-	
	7.2			-	-	-	-	

	7.3			-	-	-	-	
8	8.1	Microbial Symbioses	1, 2, 4	-	-	-	-	Ch 22
	8.2			-	-	-	-	
	8.3			-	-	-	-	
9	9.1	Microbial Interactions with Humans	1, 4, 5	-	-	-	-	Ch 23
	9.2			-	-	-	-	
	9.3			-	-	-	-	
10	10.1	Functional Diversity of Bacteria	1, 2, 5, 6	-	-	-	-	Ch 14
	10.2			-	-	-	-	
	10.3			-	-	-	-	
11	11.1	Continue		-	-	-	-	
	11.2			-	-	-	-	
	11.3			-	-	-	-	
12	12.1	Microbial Genomics	1, 2, 3	-	-	-	-	Ch 6
	12.2			-	-	-	-	
	12.3			-	-	-	-	
13	13.1			-	-	-	-	
	13.2	Discussion		-	-	-	-	
	13.3	Discussion		-	-	-	-	
14	14.1	Student's Presentations		-	-	-	-	
	14.2			-	-	-	-	
	14.3			-	-	-	-	
15	15.1	Student's Presentations		-	-	-	-	
	15.2			-	-	-	-	
	15.3			-	-	-	-	

مركز الاعتماد وضمان الجودة
ACCREDITATION & QUALITY ASSURANCE CENTER

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
Quizzes	15	Selected topics	1,2	1-13	eLearning/Paper
Students' Presentation	15	Selected topics	3,4,5,6	1-13	eLearning/Paper
Midterm Exam	30	Midterm material	1,2,3,4,5,6	7	Written
Final Exam	40	All course material	1,2,3,4,5,6	15	Written

23 Course Requirements

Textbook

eLearning account

24 Course Policies:

A- Attendance policies:

Attendance is required, and students missing some of the 1-hour classes will jeopardize their successful completion of the course, due to the discussion nature of the course and the key elements discussed during the course that cannot be found in the textbook. Also, students are required to refer to Student Handbook for questions related to attendance and absence.

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

According to the University of Jordan regulations, refer to student handbook

المادة)17(: أ -كل من يتغيب بعذر عن امتحان معلن عنه باستثناء المتحان النهائي، عليه أن يقدم ما يثبت عذره لمدرس المادة خالل ثالثة أيام عمل من تاريخ زوال العذر، وفي حالة قبول مدرس المادة لهذا العذر فعليه إجراء امتحان معوض للطالب وإذا لم يقبل مدرس المادة العذر تعتبر عالمته صفرًا ، في هذا المتحان .

C- Health and safety procedures:

Although this course has no laboratory component, health and safety is emphasized throughout the course due to the nature of topics discussed. This is mainly related to working with human, animal and plant objects, and the health and safety concerns related to the consumption of genetically modified products or additives.

D- Honesty policy regarding cheating, plagiarism, misbehavior:

According to The University of Jordan regulations. Students shall refer to Student Handbook for questions related to cheating and plagiarism.

E- Grading policy + Weighting (i.e. weight assigned to exams as well as other student work)

Midterm exam	30%
Participation Lecture Presentation	15%
Quizzes	15%
Final exam	40%

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

E-Learning portal, and online resources from the e-library to access scientific literature.

25 References:

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

"**Brock Biology of Microorganisms**", 15/E, by Madigan, Martinko, Bender, Buckley, Stahl & Brock, © 2019 by Pearson Education, Inc.

B- Recommended books, materials, and media:

- "**Allies and Enemies How the World Depends on Bacteria**" 1/E, by Anne Maczulak, © 2011 by Pearson Education, Inc.

- Literature to support the course

26 Additional information:

N/A

Name of Course Coordinator: **Dr. Mamoon Al-Rshaidat**	Signature: -	Date: 9 Oct. 2023
Head of Curriculum Committee/Department:	Signature: --	
Head of Department: Dr. Mamoon Al-Rshaidat	Signature: --	
Head of Curriculum Committee/Faculty:	Signature: --	
Dean: Dr. Mahmoud Al-Gaghoub	Signature: --	