The University of Jordan

Accreditation & Quality Assurance Center

COURSE Syllabus

1	Course title	Microbial Ecology
2	Course number	0354742
3	Credit hours (theory, practical)	(3,0)
	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	Faculty	Sciences
9	Department	Biological Sciences
10	Level of course	Graduate
11	Year of study and semester (s)	Graduate
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	Sep 4 , 2016

16. Course Coordinator:

Dr. Mamoon M.D. Al-Rshaidat
Office: Biological Sciences Building, Second Floor
Office Hours: Sunday & Tuesday 10:00-11:00, Wednesday 11:00-12:00
Phone Number: Ext. 22210
Email: m.rshaidat@ju.edu.jo

17. Other instructors:

Dr. Mamoon M.D. Al-Rshaidat
Office: Biological Sciences Building, Second Floor
Office Hours: By appointmnet
Phone Number: Ext. 22210
Email: m.rshaidat@ju.edu.jo

18. Course Description:

As stated in the approved study plan.
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.

19. Course aims and outcomes:

A- Aims:

The course will provide students with 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 stucture 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 environemental and industrial biotechnological applications
6. Degradation of pollutants (petroleum, aromatic compounds, heavy andradioactive elements etc.)
7. Nitrogen, Iron and sulfur cycles in ecosystems
8. Bioremediation of material in built environment

B- Intended Learning Outcomes (ILOs): Upon successful completion of this course students will be able to …

Successful completion of the course should lead to the following outcomes:

1.	The role of different microbial structures in the microbial life.
2.	The advantage of being small in bacterial adaptation to environmental conditions
3.	Optimization of the microbial activities by adjusting the environmental variables on surface or subsurface.
4.	Microbial activities and their important roles in mobilizing and accumulating toxic metals and pathogens
5.	Degradation of the organic compounds both aerobic and anaerobic and the co-metabolism concept.
6.	The role of microbes in cleaning polluted sites.
7.	The role of microbes in climate change mitigation.

20. Topic Outline and Schedule:

Topic	Week	Instructor	Achieved ILOs	Evaluation Methods	Reference
Intro to Course; Microbial Ecology	1.	M. Al-Rshaidat			
Methods in Microbial Ecology	2.	M. Al-Rshaidat	3		
Continue…	3.	M. Al-Rshaidat			
Microbial Ecosystems	4.	M. Al-Rshaidat	1, 2, 5		
Continue…	5.	M. Al-Rshaidat			
Nutrient Cycles	6.	M. Al-Rshaidat	1, 3, 4, 5, 7		
Continue....	7.	M. Al-Rshaidat			
Microbiology of the Built Environment	8.	M. Al-Rshaidat	1, 2, 3, 6, 7		
Review and Midterm Exam Week	9.	M. Al-Rshaidat			
Microbial Symbioses	10.	M. Al-Rshaidat	1, 2, 4		
Microbial Interactions with Humans	11.	M. Al-Rshaidat	1, 4, 5		
Functional Diversity of Bacteria	12.	M. Al-Rshaidat	1, 2, 5, 6, 7		
Research Proposals Final Document Due	13.	M. Al-Rshaidat			
Students' Presentation	14.	M. Al-Rshaidat			

Students' Presentation	15.	M. Al-Rshaidat			

21. Teaching Methods and Assignments:

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

This coures will be taught in lectures class format. Composed of three 1-hour lectures each week. Lectures will be presented in blocks of key topics. Attendance at lectures is critical for obtaining a full understanding of the subject content (note that students who do not attend lectures will have a reduced likelihood of passing the exam).

A topical chapter from the text book will be selected and students will be required to read the chapter prior to attending a 1 hour discussion group where the key features of the paper are covered in a student-led discussion.

As part of the assessment for this course, students will also be required to submit a Research Proposal and present an oral presentation in weeks 14 and 15. A short tutorial focused on writing the Research Proposal will be provided during the first half of the semester and attendance is essential for successful completion of this major component of the assessment. During the oral presentatio of the students for their research proposal, all other students are required to come up with questions, playing the role of the evaluators for a funding agency, essential for the evaluation purpose of the proposal.

22. Evaluation Methods and Course Requirements:

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

Evaluation criteria #1: Punctuality and commitments to deadlines
This evaluation will be based on assignments given to students, with a primary purpose of teaching them the value of deadlines and the ability to organize their schedule to fulfill these deadlines. This includes preparation for chapters to be presented by students, summary of their research rojects, submission of the final draft of the written research proposal and submission of the error free power point presentation

Evaluation criteria #2: Written exam
Based on essay questions of the comprehensive, application, analytical, and knowledge type criteria. Two exams will be evaluated; Midterm exam (30%) and Final Exam (40%)

Evaluation criteria #3: Reseaerch Proposal
Each student is requested to choose a research topic of *a problem local to Jordan*, and try to evaluate the problem, search for literature, and finally write a research proposal to study this problem through finding the correct techniques and protcols to sample; analyse; and achieve the goal of the research project. The main intended learning outcome of this task is contribute tohe development of the following graduate attributes:

1. Enhance analytical thinking ability of the student
2. Disciplinary knowledge and its appropriate application
3. Enhance enquiry-oriented approach
4. Enhance the professional skills and their appropriate application, such as communication skills, innovation, and initiative

Evaluation criteria #4: Oral Preseantations
Evaluation based on the oral presentation of each student's research project to their peers and people from diverse scientiic backgrounds, and convence them with the necessity of the research project and the goals it will achieve. In addition to enhancing the student's ability to communicate their scientific knowledge to their peers through the presentation of the selected chapters from the text book.

Evaluation criteria #5: Peer Review of Oral Preseantations
Part of the student evaluation will be based on the ability of the student to peer review the oral presentaions of their peers. Where each student is required to ask their peers a key question about their oral presentation. This question will be part of each student's evaluation for their own proposal.

23. 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 (pages 133-134) for questions related to attendance and absence.

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

According to the University of Jordan regulations, refere to student handbook (pages 133-134)

C- Health and safety procedures:

Not emphasised in this course due to the lack of practical component.

D- Honesty policy regarding cheating, plagiarism, misbehavior:

According to The University of Jordan regulations. Students shall refer to Student Handbook (pages 63-71) for questions related to cheating and plagiarism.

E- Grading policy:

Mid-term exam	30%
Research Proposal	15%
Oral Presentations (chapters and research proposal)	15%
Final Exam	40%

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

Online resources from the e-library to access scientific literature.

24. Required equipment:

Class-room, data show, projector screen, whiteboard

25. References:

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

"**Brock Biology of Microorganisms**", 14/E, by Madigan, Martinko, Bender, Buckley, Stahl & Brock, © 2015 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 student's research proposal

26. Additional information:

Name of Course Coordinator: **Dr. Mamoon M.D. Al-Rshaidat** Signature: ---------- Date: ---------

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