Course Specification
(Bachelor)

Course Title:	Microbial Pollution
Course Code:	BIO-1454
Program:	Bachelor of Science in Biology.
Department:	Biology
College:	Science
Institution:	Imam Mohammad Ibn Saud Islamic University (IMSIU)
Version:	*Course Specification Version Number*
Last Revision Date:	*Pick Revision Date.*

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: 4 (3 Lectures + 2 Lab)					
2. Course type					
A.	☐University	☐College	☒ Department	☐Track	Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: (Level 8/ Third Year)					
4. Course General Description:					
Introduce microbial processes of environmental and geochemical significance and provide detailed information on the most up to date methods for the study of microbial communities. A survey of modern micro-organisms and their activities of environmental and geochemical importance is an important foundation for the module as is the way that metabolic processes catalysed by micro-organisms are related to major elemental cycles, biogeochemical processes and contamination.					
5. Pre-requirements for this course (if any)**:**					
Entomology – BIO 353					
6. Co-requisites for this course (if any)**:**					
None					
7. Course Main Objective(s):					
The most up to date molecular methods used to study the diversity and activity of micro-organisms in their natural habitats are detailed along with their and limitations. So, it is expected to be after the study that course the student be able: • To describe microbes contaminated air, water and food. • To comparing pollution treatment methods with microorganisms. To determine the damage caused by these microorganisms.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	√	100%

No	Mode of Instruction	Contact Hours	Percentage
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	36
2.	**Laboratory/Studio**	24
3.	**Field**	
4.	**Tutorial**	
5.	**Others (specify)**	
Total		60

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	To describe the contamination with micro-organisms in the environment (water – air –soil).	**K1-K2**	Interactive lectures. Panel of discussions and dialogue.	Written tests assignments.
1.2	To recognize treatment with micro-organisms for contaminated soil, water and air.	**K1-K2**	Learning colleagues and mental focus	Written tests assignments.
…				
2.0	**Skills**			
2.1	To reconstruct the ability to a conclusion information about the	**S1-S2**	Mental focus.	Performance of written tests. Identification tests

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
	general pathogenic microbial features.			
2.2	To design and conduct experiments and evaluate the results of the work through the development of standards and criteria for evaluation.	**S1-S2-S3**	Find the collective Research.	Work sample tests.
2.3	To reconstruct the ability to a conclusion information about the general pathogenic microbial features.	**S1-S3**	Problem-solving and decision-making.	Bags achievement portfolio.
3.0	**Values, autonomy, and responsibility**			
3.1	To write reports, preparation of presentations and the preparation of graphics and models by using technology.	**V1**	Scientific forums.	Self-report - methods.
3.2	To manipulate the operation and use of computers and means of modern technology.	**V1-V3**	Seminars and mental focus.	Assigning students to conduct research using the Internet and modern technology.
3.3	To write reports, preparation of presentations and the preparation of graphics and models by using technology.	**V3**	Default - laboratories Illustrated presentations	Laboratory reports and recording student performance.

C. Course Content

No	List of Topics	Contact Hours
1.	Air pollution with micro-organisms.	
2.	Soil contamination with micro-organisms.	
3.	Water pollution with micro-organisms.	

4.	Microorganisms caused for polluting.	
5.	Methods of studying viruses.	
6.	Sources of pollution with micro-organisms.	
7.	Problems of microbiological contamination, and means of preventing.	
8.	The role of microorganisms in the detection of environmental pollution.	
9.	Reagents with micro-organisms for air pollution.	
10.	Reagents with micro-organisms for soil pollution.	
11.	Reagents with micro-organisms for water pollution.	
12.	Microorganisms and treatment of environmental pollution.	
13.	Treatment with micro-organisms for contaminated air, soil and water.	
Total		

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	**Midterm 1**	**Around 3rd - 5th week**	**15%**
2.	**Midterm 2**	**Around 6th – 8th week**	**15%**
3.	**Quizzes, Attendance, Participation, Home works.**	**All the semester**	**10%**
4.	**Lab reports**	**All the semester**	**5%**
5.	**Lab Exam**	**Around 9th – 10th week**	**15%**
6.	**Final Exam**	**Around 11th – 12th week**	**40%**
	Total		**100%**

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Ross E .Mckinney, Environmental Pollution Control Microbiology. A Fifty-Year Perspective, (2004). ISBN 9780824754938. Tulasi Satyanarayana, Micro-orgaanisms in Environmental management: Microbes and Environment (2012) ISBN-13: 978-9400722286.
Supportive References	Bulletins and - Periodicals of King Abdul-Aziz City for Science and Technology

Electronic Materials	Electronic programs include highlights problems resulting from pollution with micro-organisms.
Other Learning Materials	CDs belonging to microbial pollution.

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Each classroom is equipped with PC and retro projector with a maximum of 30 students. And the laboratory room is equipped with many laboratory instruments with a maximum of 20 students.
Technology equipment (projector, smart board, software)	The computers are equipped with different software's. and connected to data show and to smart board.
Other equipment (depending on the nature of the specialty)	Specific laboratory equipment for this course including posters, models of different experimental animals, dissection instruments, light microscopes, dissection microscopes, microtome instrument, slide preparations, mixer, fluorescent microscopes, ELISA unit for detecting Ag-Ab reactions, molecular instruments like gel electrophoresis, PCR centrifuge, thermal cycler, an illuminator, some media agar and petri-dishes, centrifuges, incubators, ovens and other glass wares.

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Direct
Effectiveness of Students assessment	Course coordinator	Indirect
Quality of learning resources	Peer Reviewer	Indirect
The extent to which CLOs have been achieved	Course coordinator	Direct
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	
REFERENCE NO.	
DATE	