هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

Course Specifications

Course Title:	**Soil Microbiology**
Course Code:	**2013214-3**
Program:	**Bachelor in Microbiology**
Department:	**Biology department**
College:	**Science**
Institution:	**Taif University**

Table of Contents

A. Course Identification

1. Credit hours: 3h
2. Course type **a.** University ☐ College ☐ Department ☑ Others ☐ **b.** Required ☑ Elective ☐
3. Level/year at which this course is offered: 8th level / 3rd year
4. Pre-requisites for this course (if any)**:** Microbial Ecology 2012206-2
5. Co-requisites for this course (if any)**: None**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	6 hrs/Week	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	30
2	**Laboratory/Studio**	30
3	**Tutorial**	-
4	**Others** (specify)	-
	Total	60

B. Course Objectives and Learning Outcomes

1. Course Description:

Studying the types of soil, Microorganisms in soil, Role of microorganisms in soil fertility, Rhizosphere zone, Carbon cycle, nitrogen fixation, bio-fertilizers and bio-gas.

2. Course Main Objective:

1-Describe role of microbes in the biological activity of soil, Study the effect of soil properties on microbes, Study Rhizosphere zone, Study of nitrogen and carbon cycle and Learn role of microorganisms in bio-fertilizers and bio-gas production.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding:**	
1.1	Outline soil composition, List of certain microorganisms responsible for minimization of organic matter	K2
1.2	Define major applications of microbial activity in soil and biotechnological processes for microbial carbon and nitrogen fixation in soil, Distinguished major microbial group responsible for preparation of biologically rich organic fertilizers.	K3

CLOs		Aligned PLOs
2	**Skills:**	
2.1	Investigate the right type of microorganism(s) to have a positive impact on soil fertility	S2
2.2	Illustrate the efficiency of the whole microbiological activities in soil.	S3
3	**Values:**	
3.1	Use computers and internet in collecting more advanced soil microbiology data	C2
3.2		

C. Course Content

No	List of Topics	Contact Hours
1	**Chapter 1**: Introduction to soil structure and its relationship to the growth of microbes	3L+3P
2	**Chapter 2**: Main microbial groups in the soil	3L+3P
3	**Chapter 3**: The effect of different microbes on the properties of the soil	3L+3P
4	**Chapter 4**: The effect of agriculture and agricultural process on the biological activity in the soil.	3L+3P
5	**Chapter 5**: The effect of soil properties on the microbial activity.	3L+3P
6	**Chapter 6**: Microbial activity in the rhizosphere zone	3L+3P
7	**Chapter 7**:Carbon cycle	3L+3P
8	**Chapter 8**: Nitrogen cycle A- Main processes of the cycle	3L+3P
9	**Chapter 8**: Nitrogen cycle B- Nitrogen-fixing microbes	3L+3P
10	**Chapter 9**: Organic-fertilizers production (Compost) **Chapter 10**: Bio-gas production **Chapter 11**: Bio-fertilizers production	3L+3P
Total		30L + 30 P

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding:**		
1.1	Outline soil composition, List of certain microorganisms responsible for minimization of organic matter	Lectures Concept maps	Paper-based exams
1.2	Define major applications of microbial activity in soil and biotechnological processes for microbial carbon and nitrogen fixation in soil, Distinguished major microbial group responsible for preparation of biologically rich organic fertilizers.	Lectures	Paper-based exams
2.0	**Skills:**		
2.1	Select the right type of microorganism(s) to have a positive impact on soil fertility	Interactive learning Brain storming	Practical reports Practical exam

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
2.2	Illustrate the efficiency of the whole microbiological activities in soil.	Open discussion Small group activities	Assignments
3.0	**Values:**		
3.1	Use computers and internet in collecting more advanced soil microbiology data	Open discussion Small group activities	Assignments
3.2			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Assignments and activities: 1- Written Assignment Power-point presentation	Variable	10
2	Midterm Exam	5th	20
3	Periodic Exam	7th	10
4	Practical Reports	Continuous	15
5	Final Practical Exam	11th	5
6	Final Exam	12th	40

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :
6 hours per week for academic advice and consultations

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	١- Zaki, S and Abdelhafiz (1990). Soil microbiology. Anglo Library, Cairo, Egypt ٢- Eldor A. Paul. 2015.Soil Microbiology, Ecology and Biochemistry . Fourth Edition
Essential References Materials	Robert L. Tate. 2020. Soil Microbiology, Third Edition. John Wiley & Sons, Inc.
Electronic Materials	Blackboard website; Website of Saudi digital Library
Other Learning Materials	Computer-based programs and professional software

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	-Classroom (capacity not more than 40 students) for 2 h/week. -Microbiology Lab (capacity not more than 20 students) for 3 h/week.

Item	Resources
Technology Resources (AV, data show, Smart Board, software, etc.)	Data show Projectors, smart blackboard Computer Portable Power Point presentation to special lectures.
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Incubators Micropipettes and its tips Petri dishes Disinfectants Culture media

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment	Students	Indirect
Quality of learning resources	Peer Reviewer Students	Direct Indirect
Extent of achieving the course learning outcomes	Peer Reviewer Students	Direct Indirect

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	**Biology Department**
Reference No.	**Committee number 14 - Academic Year 1442-1443H**
Date	**22\5\2022G – 21\10\1443H**

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