



Course Specification

— (Bachelor)

Course Title: Microbiology

Course Code: 2052202-3

Program: Bachelor of Biotechnology

Department: Department of Biotechnology

College: College of Science

Institution: Taif University

Version: V4

Last Revision Date: 4/1445 – 9/2023



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A. General information about the course:

1. Course Identification

1. Credit hours:

3 (2 Lecture, 1 Lab)

2. Course type

A. University College Department Track Others
B. Required Elective

3. Level/year at which this course is offered:

(4th level/2nd year)

4. Course general Description:

Provide basic concepts of microbiology, the discovery and history of microbes, taxonomy of microorganisms, microbial cell structure and function, brief microbial physiology and metabolism, nutrition, growth and methods of control, microbial genetics, infectious diseases, immunity, epidemiology, and control of microbial growth. The course will also cover detection of bacteria and fungi, media preparation and growth evaluation, growth curve, and isolation of bacteria and fungi.

5. Pre-requirements for this course (if any):

Genetics, 2052104-3

6. Co-requirements for this course (if any):

None

7. Course Main Objective(s):

Recognize the techniques used to grow and identify microorganisms, Explain the basic principles of microbiology including the organisms studied and the biological and chemical prerequisite knowledge necessary to understand how they function. And identify the cellular structures of microorganisms, and describe the function of each structure.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100%
2	E-learning		
3	Hybrid <ul style="list-style-type: none"> • Traditional classroom • E-learning 		
4	Distance learning		

3. Contact Hours (based on the academic semester)



No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	15
3.	Field	
4.	Tutorial	
5.	Others (specify)	
Total		45

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

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Explain microbial cellular functions in the areas of cellular energy, growth, and genetics	K1	Lecture	Written Exams
1.2	Explain both beneficial and harmful interactions between microbes and humans and how humans are dealing with these interactions.	K2	Lecture	Written Exams
2.0	Skills			
2.1	Practice various techniques to study microorganisms	S2	Projects, Problem solving	Written Practical Exam
3.0	Values, autonomy, and responsibility			
3.1	---	---	--	--

C. Course Content

No	List of Topics	Contact Hours
1.	History of Microbiology	2
2.	Microorganisms, the germ theory, prokaryotic cells	2
3.	The Anatomy of the Prokaryotic Cell Comparison of Prokaryotic and Eukaryotic Cells	2
4.	Microbial Growth and physiology	4
5.	Bacteria, taxonomy, bacterial genetics, mutations and types of mutations, mutagens and Frequency of Mutation, genetic Transfer and Recombination	6





6.	Viruses, virus characteristics, taxonomy, and genetics	4
7.	Fungi, characteristics, taxonomy, genetics	4
8.	Microorganisms and diseases	2
9	Modern Developments in Microbiology, vaccination, vaccine development	4
Total		30

List of practical topics	Contact hours
The use and care of the microscope, Introduction to Staining and Simple Stain.	2
Aseptic Techniques and Inoculation of Bacteria: Nomenclature, Colony, and Cell Morphology	4
Isolation of pure culture - Smear Preparation, Simple Stain, Negative Stain	4
Gram Stain, Spore Stain	2
Acid Fast and Capsule Stain	2
Differential and Selective Media	4
Citrate Test, Catalase test	2
Antiseptics and Disinfectants	2
Antibiotics and Antimicrobials	4
Identification of unknown organism	4
Total	30

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm Exam	Week 7	20%
2.	Periodical exam	Week 10	10%
3.	Project, Discussion	Week 11	10%
4.	Practical Exam	Week 15	20%
5.	Final Exam	Week 16	40%

*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

1. Microbiology Fundamentals: A Clinical Approach 2nd Edition by Marjorie Kelly Cowan





	2. Lectures in Microbiology
Supportive References	1. medical microbiology by E. Jawetz (2008) 2. Microbiology: An Evolving Science (W. W. Norton, Inc.) by Joan Slonczewski and John Foster. Text book of microbiology, by R. Ananthan Rayan, Ck. J Panikkar 6 th (2004)
Electronic Materials	NBCI website (https://www.ncbi.nlm.nih.gov) The web site of blackboard in Taif university: http://lms.tu.edu.sa/ .
Other Learning Materials	1. Software: Clastral W 2. Biosafety system in the lab for practical exercises

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	1. One classroom 2 hours per week for each section 2. Laboratory 3 hours per week for each practical section
Technology equipment (projector, smart board, software)	Data show, Smart board, and internet connection., Gel documentation instrument, PCR, Electrophoresis units, centrifuge, pipettes,
Other equipment (depending on the nature of the specialty)	1. Microscopes 2. Incubator, Autoclave, Micropipettes, Direct flame, needle loop, glassware, bacterial media, basic salts, slides, Petri dish, stains.

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Peer Review, Students	Direct (Independent Reviewer), Indirect (survey)
Effectiveness of Students assessment	Faculty members	Direct (Random Correction)
Quality of learning resources	Students	Indirect (survey)
The extent to which CLOs have been achieved	Faculty members	Direct
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	DEPARTMENT COUNCIL
REFERENCE NO.	6





DATE

5/11/2023

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