



## Course Specifications

<b>Course Title:</b>	<b>Microbiology</b>
<b>Course Code:</b>	<b>2062141-3</b>
<b>Program:</b>	<b>Bachelor in Food Science and Nutrition</b>
<b>Department:</b>	<b>Food Sciences and Nutrition Department</b>
<b>College:</b>	<b>College of Science</b>
<b>Institution:</b>	<b>Taif University</b>

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## A. Course Identification

<b>1. Credit hours:</b> 3 Hours
<b>2. Course type</b>
a. University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b. Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
<b>3. Level/year at which this course is offered:</b> 4 <sup>th</sup> Level / 2 <sup>nd</sup> year
<b>4. Pre-requisites for this course (if any):</b> General biology (201104-4)
<b>5. Co-requisites for this course (if any):</b> None

### 6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	6 hr/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	20
3	Tutorial	---
4	Others (specify)	---
	<b>Total</b>	<b>50</b>

## B. Course Objectives and Learning Outcomes:

<p><b>1. Course Description</b></p> <p>This course deals with studying the principals of Microbiology – Historical review of the pioneer microbiologist – Importance of microorganisms - Development of microbiology – Classification of microorganisms (Bacteria, Fungi, Microalgae, Parasites, in addition to Viruses) – Chemistry of microbial cell - Structure of microbial Cell – Nutrition and microbial metabolism – Growth and reproduction – Microorganisms in medicine, industry, agriculture, environment and biotechnology.</p>
<p><b>2. Course Main Objective:</b></p> <ol style="list-style-type: none"> <li>1) This course covers the general basics of microbiology, classification, characterization, nutrition, replication of microorganisms and importance of microorganisms.</li> <li>2) Follow up the recent advances in the field of Microbiology including microbiological standards, rapid methods of detecting microbial. This can be achieved by continuously visit the official web sites of the national and international organizations interested in microbiology.</li> </ol>

### 3. Course Learning Outcomes:

CLOs		Aligned PLOs
1.0	<b>Knowledge and understanding</b>	
1.1	Define eukaryotic and prokaryotic cells	<b>K 3</b>
1.2	Describe the factors affecting microbial growth	<b>K 3</b>
1.3	Recognize the functions of microbial structures and the difference between bacteria, Viruses, Fungi and Algae.	<b>K 3</b>
2.0	<b>Skills:</b>	
2.1	Demonstrate the function of structures of microbial cells and viruses.	<b>S 3</b>
2.2	Compare between the modes of multiplication in microorganisms.	<b>S 3</b>
2.3	Apply the general roles and biosafety requirements in microbiology labs.	<b>S 3</b>
3	<b>Values:</b>	
3.1	Cooperate during preparation of different microbial media.	<b>V 2</b>
3.2	Participate to prepare the reports for each type of microorganisms and the recent advances in the field of microbiology.	<b>V 2</b>

### C. Course Content:

No	List of Topics	Contact Hours
1	Introduction to Microbiology: History and scope of microbiology, prokaryotic and eukaryotic cells – Viruses.	3
2	Importance of microorganisms.	3
3	Bacteria (Classification – Cell Structure – Morphology - Mobility - Growth and Reproduction - Metabolism – Applications). ( <i>Continued</i> )	3
4	Bacteria (Classification – Cell Structure – Morphology - Mobility - Growth and Reproduction - Metabolism – Applications). ( <i>Continued</i> )	3
5	Fungi (Classification - Vegetative structure of fungi – Morphology – Nutrition - Growth and Reproduction - Metabolism – Applications)	3
6	Yeast: (Classification – Cell Structure - Morphology – Nutrition - Growth and Reproduction – Metabolism - Applications).	3
7	Viruses (Classification- Chemical Structure – Morphology - Serological Properties - Replication in host cells - Applications).	3
8	Microalgae (Classification- Chemical Structure – Growth - Metabolism – Reproduction- Replication in host cells - Applications).	3
9	Parasites (Classification - Examples – Hosts).	3
10	Applications of (Bacteria, Fungi and Microalgae).	3
<b>Total</b>		<b>30</b>
<b>Practical Topics</b>		
1	Guidelines for working in microbiology laboratory - Laboratory safety precautions - Practical guidelines.	2
2	Methods of sterilization used in microbiological laboratories.	2
3	Microbial media - types - methods of preparation (bacterial media - fungal media - propagation of viruses).	2
4	Microscopic examination of microbes - Microscopic types. ( <i>Continued</i> )	2
5	Microscopic examination of microbes - Simple methods of staining of microorganisms - Complex Staining - Acid resistant staining - Negative staining (indirect) – spore staining.	2
6	Bacterial motility- Quantitative estimation of bacterial growth.	2
7	Preparation of fungal models for microscopic examination and staining methods.	2

8	Spread of microbes in nature - Study of bacterial groups- Cultivation of microorganisms - Isolation and purification of microbes.	2
9	Effect of some environmental factors on bacteria.	2
10	Viruses - Determination of concentration of bacterial viruses- Examine the internal contents of viruses - Counting viruses.	2
<b>Total</b>		<b>20</b>

## D. Teaching and Assessment

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

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
<b>1.0</b>	<b>Knowledge and understanding</b>		
1.1	Define eukaryotic and prokaryotic cells	- Lecture.	- Written exam
1.2	Describe the factors affecting microbial growth	- Lecture - Practical demonstrations	- Written exam - Practical exam
1.3	Recognize the functions of microbial structures and the difference between bacteria, Viruses, Fungi and Algae.	- Lecture	- Written exam
<b>2.0</b>	<b>Skills</b>		
2.1	Demonstrate the function of structures of microbial cells and viruses.	- Write a short search	- Written exam - Report evaluation
2.2	Compare between the modes of multiplication in microorganisms.	- Lecture Practical demonstrations	- Written exam - Practical exam
2.3	Apply the general roles and biosafety requirements in microbiology labs.	- Practical demonstrations	- Practical exam
<b>3.0</b>	<b>Values</b>		
3.1	Cooperate during preparation of different microbial media.	- Practical lessons	- Practical exam
3.2	Participate to prepare the reports for each type of microorganisms and the recent advances in the field of microbiology.	- Work in small groups and e-learning	- Report evaluation

### 2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Assignment and Interaction during lectures	Continues	10%
2	Midterm exam	5-6	20%
3	Weekly Lab. Reports	Continues	20%
4	Practical exam	11	10%
5	Final exam	12	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 :

- There are 6 h per week for this purpose and the students know these hours according to the time of professor who teach the course.
- Student satisfaction surveys are conducted for academic guidance.
- Develop an improvement plan for academic guidance based on the results of the questionnaire analysis.

## F. Learning Resources and Facilities

### 1. Learning Resources:

<b>Required Textbooks</b>	<ul style="list-style-type: none"> <li>- Wessner D.; C. Dupont; T. Charles and J. Neufeld (2016). Microbiology, 2nd Edition. Wiley-Blackwell, September 2016, ISBN: 978-1-119-32066-1, 960 Pages.</li> <li>- Stuart H. (2013). Essential Microbiology, 2nd Edition, Wiley-Blackwell. June 2013, ISBN: 978-1-119-97890-9, 528 Pages.</li> <li>- Jacquelyn G. and Laura J. Black (2017). Microbiology Principles and Explorations. Wiley-Blackwell. December 2017, ISBN: 978-1-119-39011-4, 896 Pages.</li> </ul>
<b>Essential References Materials</b>	<ul style="list-style-type: none"> <li>- Lammert J. M. (2007). Techniques for Microbiology: a student handbook. Upper Saddle River, NJ: Prentice Hall. ISBN:0132240114 9780132240116</li> <li>- Internet sites and search engines.</li> </ul>
<b>Electronic Materials</b>	<ul style="list-style-type: none"> <li>- Sciencedirect.com</li> <li>- PubMed.</li> <li>- Springer.</li> <li>- <a href="https://www.nature.com/subjects/microbiology">https://www.nature.com/subjects/microbiology</a></li> <li>- <a href="https://www.microbiologysociety.org/">https://www.microbiologysociety.org/</a></li> </ul>
<b>Other Learning Materials</b>	Computer.

### 2. Facilities Required:

Item	Resources
<b>Accommodation</b> (Classrooms, laboratories, demonstration rooms/labs, etc.)	<ul style="list-style-type: none"> <li>- Classroom (capacity not more than 40 students) for 3 h/week.</li> <li>- Microbial Lab (capacity not more than 20 students) for 3 h/week</li> </ul>
<b>Technology Resources</b> (AV, data show, Smart Board, software, etc.)	<ul style="list-style-type: none"> <li>- Data Show projectors, smart blackboard.</li> <li>- Computer Portable PowerPoint presentations to special lectures.</li> </ul>
<b>Other Resources</b> (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	<ul style="list-style-type: none"> <li>- Data Show projectors, smart blackboard.</li> <li>- Computer Portable PowerPoint presentations to special lectures.</li> </ul>

## G. Course Quality Evaluation:

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment	Students, faculty, program leaders and Peer Reviewer	<ul style="list-style-type: none"> <li>• Continuous monitoring by directors of program and quality assurance unit (Direct).</li> <li>• Applying Questionnaires received from the Deanship of Academic Development for Student evaluation (indirect).</li> <li>• Evaluation of course report (indirect).</li> </ul>
Extent of achievement of course learning outcomes	Students, faculty, program leaders and Peer Reviewer	<ul style="list-style-type: none"> <li>• Applying Questionnaires for Student evaluation (indirect).</li> <li>• Evaluation of course report (indirect).</li> </ul>
Quality of learning resources	Faculty, program leaders,	<ul style="list-style-type: none"> <li>• Continuous monitoring by</li> </ul>

Evaluation Areas/Issues	Evaluators	Evaluation Methods
	administrative staff, independent reviewers.	directors of program and quality assurance unit (Direct). <ul style="list-style-type: none"> <li>• Applying Questionnaires for Student evaluation (indirect).</li> <li>• Evaluation of course report (indirect).</li> </ul>

**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	Department council - Academic Development Committee	
Reference No.	Department council NO: 5	Subject NO: 2
Date	08 /07 /1444 H	