Course Specifications

Course Title:	**Virology and Bacteriology**
Course Code:	**23073440-3**
Program:	**BSc Biology**
Department:	**Biology**
College:	**Aljumum University Collage**
Institution:	**Umm Al-Qura University**

Table of Contents

A. Course Identification

1. Credit hours: **3 hours**
2. Course type **a.** University ■ College ☐ Department ☐ Others ☐ **b.** Required ☐ Elective ☐
3. Level/year at which this course is offered: **Level 6 /3rd year**
4. Pre-requisites for this course (if any)**:** **General Biology 23071101-4**
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	3 hrs per weeks	100%
2	Blended		
3	E-learning		
4	Correspondence		
5	Other		

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	Lecture	42
2	Laboratory/Studio	3
3	Tutorial	
4	Others (specify)	
	Total	
Other Learning Hours*		
1	Study	
2	Assignments	
3	Library	
4	Projects/Research Essays/Theses	
5	Others (specify)	
	Total	

* The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

- ❖ To provide the students with the basic information about microorganisms
- ❖ Develop the student's ability to learn and understand the mode of life of microorganisms.
- ❖ Develop the students in the remedy common mistakes to be able to distinguish between bacteria and virus.
- ❖ To provide information about pathogenic, non-pathogenic and useful microbes.

2. Course Main Objective

After completing this course student should be able to:

- List the roles of microorganisms in the life and in different fields.
- Define basic structures between Eukaryotic and prokaryotic cells.
- Explain the fine structure of bacteria.
- Discuss the different between gram positive and negative bacteria.
- Differentiate between the different genera of bacteria.
- Describe the bacterial growth curve.
- Summarize the factors effect on bacterial growth
- Summarize the nutritional requirements of bacteria
- List the different microorganisms caused plant, animal and human diseases
- Describe the role of bacteria in genetic engineering and its applications in different fields.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge:**	
1.1	To describe the differentiation between the different groups of microorganisms	
1.2	To define bacteria under microscope	
1.3	To define the different shapes of bacteria	
1...	Beneficial use of bacteria in industries	
2	**Skills :**	
2.1	assess and merge the information from different sources	
2.2	foster critical thinking and scientific curiosity and assess and criticise, at the fundamental level how data should be derived.	
2.3	Show logical approach to problem identification and solving	
2...		
3	**Competence:**	
3.1		
3.2		
3.3		
3...		

C. Course Content

No of Weeks	List of Topics	Contact Hours
1	❖ Introduction to microbiology. - History and discovery of viruses and bacteria. - An overview about the roles of viruses and bacteria in the environment and their applications in different fields.	2

	- Distribution of viruses and bacteria in the environment. - Different between the viruses, prokaryotes and Eukaryotes	
2	❖ General Virology - Nomenclature and classification of viruses - Distinctive properties of viruses. - Morphology and ultra-structure. - Capsids and their arrangements. - Types and structures of viral envelopes. - Viral genome composition. - Virus related agents (viroids, prions, satellites).	4
2	❖ Bacterial Viruses - General Properties of bacterial viruses. - Bacteriophage structural organization. - Life cycle. ❖ Plant Viruses - General Properties of plant viruses. - Classification and nomenclature. ❖ Animal Viruses - General Properties of bacterial viruses - Classification and nomenclature of animal human viruses. - Epidemiology, lifecycle, pathogenicity. - Examples of certain important viral disease.	4
1	❖ Nomenclature of bacteria - Identification - Classification - Morphological characteristics - Phenotypic of bacteria - Genotypic of bacteria - Bergey's Manual of determinative Bacteriology - Bergey's Manual of Systematic Bacteriology	2
1	❖ Growth of bacteria - Media and growth conditions for diverse bacteria - Sterilization methods - Methods for culturing bacteria - Nutritional elements, Oxygen, light, vitamins requirements	2
3	❖ Bacterial motility - Swimming by flagella - Gliding - Rotary	6
2	❖ Bacterial staining - Simple Stains:(positive stain and negative stain) - Compound or differential stains: ○ Gram stain (different between G+ and G ○ Spore stain ○ Acid fast stain	4
1	❖ Bacterial cell structure - Cell wall - Protoplast - Cytoplasmic membrane - Cytoplasmic contents: - Bacterial genome and plasmids - Stored materials - Gas Vacuoles - Spores (in some cases)	2

2	❖ Bacterial reproduction - Reproduction methods in bacteria - Bacterial growth curve - Factors effect the growth curve of bacteria	4
2	❖ Short Description for: - Some bacterial genera important for plant and soils - Some bacterial genera cause diseases for human and animal - Some important bacteria used in foods, pharmaceuticals	4
14 Weeks		28hrs

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**		
1.1	To describe the differentiation between the different groups of microorganisms	Lectures. Mind maps.	- monthly exams - practical exam
1.2	To define bacteria under microscope		
1.3	To define the different shapes of bacteria		
1.4	Beneficial use of bacteria in industries		
2.0	**Skills**		
2.1	assess and merge the information from different sources	-Explaining the different groups of microorganisms. -Comparing taxonomically between the different genera of each group	- monthly exams - practical exam
2.2	foster critical thinking and scientific curiosity Assess and criticise , at the fundamental level how data should be derived		
2.3	Show logical approach to problem identification and solving		
3.0	**Competence**		
3.1			
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	periodic Exam	7	20%
2	Practical Exam	14	20%
3	Final exam	16	40%
4	Assignments (Homework + Activities+ attendance)	weekly	20%

***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 :

3 hours of office and guidance in the week.

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	-Book note prepared by associate prof. Dr. Khaled El Banna -Brock Biology of Microorganisms, Twelfth edition by Madigan, Martinko, Dunlap and Clark; Publisher: Pearson Prentice-Hall, ISBN: 0132324601 (2008). -Benson, H.J. (2002). Microbiological Applications. Laboratory Manual in General Microbiology, eighth edition.
Essential References Materials	Singelton, P.(1999). Bacteria. In Biology, Biochemistry and MEditioicine, Editiontion, John Wiely and Son.
Electronic Materials	www.bacteriamuseum.org/niches/wabacteria/bacteriology.shtmlhttp://www.bacterio.net
Other Learning Materials	PPT prepared by Associate prof. Dr. Khaled Elbanna

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	**Classrooms, laboratories,**
Technology Resources (AV, data show, Smart Board, software, etc.)	**Smart Board**
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	**laboratory**

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
University used to measure students feedback about the course every few years. In addition, a special form was designed by the department and are given at the end of term to measure the student's feedback about the quality of teaching and	**Any complain from students about quality of teaching and/ or course contents are always treated confidentially and considered and discussed well to find the solutions for it. In addition, as mentioned previously the department form for students feedback**	**Department teaching staff are always encourage to update their knowledge in the field of work by attending national and international conferences and self-developments courses held inside or outside the university**

Evaluation Areas/Issues	Evaluators	Evaluation Methods
course contents. Information in this feedback form are treated confidentially and students are not asked to write their names in it.	are also seen and analysed to improve any shortage in any aspects or matters	campus and a record of that is kept for each academic staff.

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	
Reference No.	
Date	

Head of Department

Dr. Wessam M. Filfilan

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