Republic of Yemen

Ministry of Higher Education &Scientific Research

21 SEPTEMBER UNIVERSITY for MEDICALS & APPLIED SCIENCES

Faculty of Medicine

Bachelor Program of Medicine and Surgery

Course Specification of

Introduction to Microbiology

Course Code. (A21P211)

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2023

T4: This Template is Developed and Approved by CAQA-Yemen, 2023

Prepared by:	Reviewed by:	Head of department	Quality Unit:	Dean of Medicine Faculty	Center of Development and Quality Assurance Dean
Dr. Taha Abdul-Aziz Alnosary	Dr Gamil Taher Abdul Mughni		Dr. Fadhl Shujaa Al-deen	Dr. Salwa Al-Ghomeri	

I. General Information:

1.	Course Title:	Introduction to Microbiology				
2.	Course Code:	A21P211				
3.	Credit Hours:	Credit Hours	Theory Contact Hours		Practical Contact Hours	
			Lecture	Tutorial/ Seminar	Lab	Clinical
		3	2	--	2	--
4.	Level/ Semester at which this Course is offered:	2nd Level / 1st Semester				
5.	Pre –Requisite (if any):	None				
6.	Co –Requisite (if any):	None				
7.	Program (s) in which the Course is Offered:	Bachelor of Medicine and Surgery (MBBS)				
8.	Language of Teaching the Course:	English				
9.	Location of Teaching the Course:	Faculty of Medicine				
10.	Prepared by:	Dr. Taha Abdul-Aziz Alnosary				
١١	Date and Number of Approval by Council:	٢٠٢٣				

II. Course Description:

Introduction to Microbiology is outline the knowledge to describe the structural components of microorganisms and the functions of these components, and to differentiate between, prokaryotes eukaryote; also to classify microorganisms and to describe host-parasite relationship, modes of transmission and infection used by microbes, bacterial genetics and gene cloning. As well as to understand the methods of sterilization and disinfection as well as antimicrobial agent and the mechanisms leading to resistance to anti-microbial agents. It is also giving the student's practical skill in uses the different technique and basic identification methods to known the microorganism.

III. Course Intended Learning Outcomes (CILOs) : Upon successful completion of the course, students will be able to:		Referenced PILOs		
A. Knowledge and Understanding:		**I,P or M/A**		
a1	Define major concepts of general microbiology	**M**	**A1**	Describe the general and basic sciences related to human body structure and functions with emphasis on normal and abnormal conditions.
a2	List the internal, external structure, physical and chemical factors that affect of bacterial.	**M**		
a3	Explain relationships between hosts and microbes and the pathogenicity of microorganism.	**M**	**A3**	Explain the pathological and pathogenesis changes in various diseases, and their etiological triggers including genetic, developmental, infectious, metabolic, endocrinal, autoimmune, neoplastic, traumatic, degenerative and occupational factors.
a4	Illustrate methods of sterilization, disinfectant and the antimicrobial chemotherapeutic agents: types, spectra of actions, modes of actions, their clinical use, mechanisms of resistance to antibiotics, and methods of investigation, and control of resistance.	**M**		
B. Intellectual Skills:				
b1	Differentiate between gram positive and gram negative bacteria, DNA and RNA viruses, and superficial mycoses, opportunistic mycoses and systemic mycoses.	**A**	**B1**	Compare between normal and abnormal conditions and predict the appropriate treatment or intervention.
b2	Classify the types of sterilization and disinfectant	**A**	**B2**	Analyze and interpret the finding from history, clinical examination and investigations to propose a diagnosis and develop a shared management plan for common acute, chronic and urgent physical and mental health presentations.
b3	Analyze the properties, uses, side effects, and mode of action of antibacterial agents.	**A**		
C. Professional and Practical Skills:				

c1	Use biosafety measured and quality control procedures in the microbiology laboratory to work in a risk-free environment.	**P**	**C1**	Perform complete clinical examination and precise investigations to reach the final diagnosis
c2	Perform the principles of specimen collection, detection, and diagnosis of infections	**P**	**C3**	Carry out routine medical procedure and demonstrate the ability of using common medical tools required for diagnosis and management with highly qualified competency.
c3	Prepare calcofluor white stain, lactophenol cotton blue stain, gram stain, biochemical test and serological test to determine the deferent causative microorganism in clinical specimens.	**P**		
	D. Transferable Skills:			
d1	Use effectively different computer skills such as internet, word processing and data sheet to interpret and analysis results and investigation of the diseases.	**I**	**D1**	Communicate with professionals, patients, their families and the community through verbal, written and other non-verbal means.
d2	Work independently or as a member of team effectively and lead teams carrying out various professional tasks and accept the view of others.	**I**	**D2**	Work individually or in a team and develop lifelong learning using up to date technology that help in understanding the diseases and its control and prevention.
I= Introduced, P=Practiced or M/A= Mastered/Advanced				

(A) Alignment of Course Intended Learning Outcomes (Knowledge and Understanding) to Teaching Strategies and Assessment Methods:

	Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies
a1	Define major concepts of general microbiology	- Interactive lectures - Presentation	- Written exam (mid and final terms and quizzes)
a2	List the internal, external structure, physical and chemical factors that affect of bacterial.	- Interactive lectures - Presentation - Self learning	Written exam (mid and final terms and quizzes)
a3	Explain relationships between hosts	- Interactive lectures	Written exam (mid and

	and microbes and the pathogenicity of microorganism.	- Seminars - Discussion - Self learning	final terms and quizzes)
a4	Illustrate methods of sterilization, disinfectant and the antimicrobial chemotherapeutic agents: types, spectra of actions, modes of actions, their clinical use, mechanisms of resistance to antibiotics, and methods of investigation, and control of resistance.	- Interactive lectures - Seminars - Discussion - Office Hours - Self learning	- Written exam (mid and final terms)

(B) Alignment of Course Intended Learning Outcomes (Intellectual Skills) to Teaching Strategies and Assessment Methods:

	Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies
b1	Differentiate between gram positive and gram negative bacteria, DNA and RNA viruses, and superficial mycoses, opportunistic mycoses and systemic mycoses.	- Interactive lectures - Discussion - Self-learning - Presentation	- Written exam (mid and final terms) Assignment
b2	Classify the types of sterilization and disinfectant	- Interactive lectures - Discussion - Self-learning - Presentation	- Written exam (and terms) Assignment
b3	Analyze the properties, uses, side effects, and mode of action of antibacterial agents.	- Interactive lectures - Discussion - Self-learning - Presentation	- Written exam (final terms) Assignment

(C) Alignment of Course Intended Learning Outcomes (Professional and Practical Skills) to Teaching Strategies and Assessment Methods:

	Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies
c1	Use biosafety measured and quality control procedures in the microbiology laboratory to work in a risk-free environment.	-Practical session.	- Practical Exam
c2	Perform the principles of specimen collection, detection,	-Practical session.	- Practical Exam

	and diagnosis of infections		
c3	Prepare calcofluor white stain, lactophenol cotton blue stain, gram stain, biochemical test and serological test to determine the deferent causative microorganism in clinical specimens.	-Practical session.	- Practical Exam

(D) Alignment of Course Intended Learning Outcomes (Transferable Skills) to Teaching Strategies and Assessment Methods:

Course Intended Learning Outcomes		Teaching Strategies	Assessment Strategies
d1	Use effectively different computer skills such as internet, word processing and data sheet to interpret and analysis results and investigation of the diseases.	- Seminars - Discussion - Self Learning - Presentation	- Assignment - Practical Exam
d2	Work independently or as a member of team effectively and lead teams carrying out various professional tasks and accept the view of others.	- Seminars - Discussion - Self Learning - Presentation	- Assignment - Practical Exam

IV. Course Contents:

A. Theoretical Aspect:

No.	Units/Topics List	Sub Topics List	Number of Weeks	Contact Hours	Learning Outcomes (CILOs)
1	**Introduction of microbiology**	History	1	2	a1,a2
2	**Differential between prokaryotes, eukaryote**	Definition, bacteria ,virus, fungi	1	2	a1, b1
3	**Bacterial morphology**	Bacterial structure ,function of cell component, spore	1	2	a1,a2 b2;d1,d2
4	**Bacterial physiology**	Microbial growth curve, physical and chemical factors.	1	2	a1,a3, d1,d2

No.	Units/Topics List	Sub Topics List	Number of Weeks	Contact Hours	Learning Outcomes (CILOs)
5	**Classification of bacteria and viruses,**	Definition, types of classification methods	1	2	a1,a4, b1, d1,d2
6	**Host-parasite relationship**	Normal flora, pathogen, virulence factors.	1	2	a1,a4, b2, d1,d2
7	**Epidemiological aspects, Transmission source and mode of infection. Pathogenicity and toxigenicity**	Definition of epidemiological aspect, pathogenicity , methods of diseases transmission	1	2	a1,a4, b2 d1,d2
8	**Mid-Term Theoretical Exam**	– MCQs and essay questions	1	2	a1,a2,a3, b1
9	**Normal flora**	Definition ,classification	1	2	a1,a2,a4, b2, d1,d3
10	**Sterilization and disinfection**	Definition and methods	2	4	a1, d1,d2
11	**Bacterial genetics, gene cloning**	Definition, DNA replication ,plasmids and Bacteriophage	1	2	a1,d1,d2
١٢	**Antimicrobial Agents: Therapy and Resistance**	Definition, mechanism of action, complication of antibacterial chemotherapy. Mechanisms of Resistance.	1	2	a4, d1,d2
١٣	**General properties of viruses**	- History - classification - Replication - pathogenesis, - virulence factors -	1	2	a1,a4 b1-b2
١٤	**Introduction to Medical Mycology**	– Definition – General characters , – Classification of Fungi, – Reproduction of Fungi	1	2	a3,a4 b1,b2,b3 d1;d2
١٥	**Laboratory diagnosis of viral and fungal**	– Direct microscopy, – Culture, – Serological tests, – Non-culture methods,	1	2	a1,a2,a3 b1, d1

No.	Units/Topics List	Sub Topics List	Number of Weeks	Contact Hours	Learning Outcomes (CILOs)
	infections	– Molecular methods.			
١6	**Final Theoretical Exam**	MCQs and essay questions	1	2	a1,a2,a3, a4 b1,b2,b3
Number of Weeks /and Units Per Semester			**16**	**32**	

B. Practical Aspect (Lab):

No.	Tasks/ Experiments	Number of Weeks	Contact Hours	Learning Outcomes (CILOs)
1	**General information about safety precaution inside the lab**	1	2	c1,c2 d1, d2
2	**Sterilization and disinfection methods**	1	2	c1,c2 d1, d2
3	**Instrumentation**	1	2	c1,c2 d1, d2
4	**Staining** Gram stain, simple stains	1	2	c1,c2 d1, d2
5	**Staining** Acid fast stain, Negative staining	1	2	c1,c2 d1, d2
6	**Preparation Of Media** Selective medium and Differential medium	1	2	c1,c2,c3 d1, d2
7	**Mid-semester exam**	1	2	c1,c2 d1, d2
8	- **Preparation Of Biochemical Tests**	1	2	c1,c2,c3, d1, d2
9	- **Preparation Of Sensitivity Test**	1	2	c1,c2,c3,

No.	Tasks/ Experiments	Number of Weeks	Contact Hours	Learning Outcomes (CILOs)
				d1, d2
10	- ***Types of Laboratory diagnosis of viral infections***	1	2	c1,c2 d1, d2
11	- Isolation of virus (Tissue culture, Embryonated chicken eggs and Laboratory animals.	1	2	c1,c2 d1, d2
12	- Serological test s for identifying virus "HBs Ag", "HCV Ab".	1	2	c1,c2 d1, d2
13	- Laboratory diagnosis methods for identification of ***Mycoses***	1	2	c1,c2 d1, d2
14	- Final Practical Exam	1	2	c1,c2,c3
Number of Weeks /and Units Per Semester		**14**	**28**	

C. Tutorial Aspect (if any):

No.	Tutorial	Number of Weeks	Contact Hours	Learning Outcomes (CILOs)
1	NA			
Number of Weeks /and Units Per Semester				

VII. Assignments:

No.	Assignments	Week Due	Mark	Aligned CILOs(symbols)
1	**Assignment 1: Compare between the Gram positive and gram negative cell well**	3rd	2	b1,b2,b3,d1,d2
2	**Assignment 2: Types of sterilizing gents**	6th	2	b1,b2,b3,d1,d2
3	**Assignment 3: Types of virulence factors**	10th	1	b1,b2,b3,d1,d2
Total			**5**	

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	**Assignments**	weeks 3-10	**5**	5%	b1,b2,b3,d1,d2
2	**Quizzes**	week 6	**5**	5%	a1,a2,a3
3	**Mid-Term Practical Exam**	week 7	**10**	10%	c1,c2,d1,d2
4	**Mid-Term Theoretical Exam**	week 8	**10**	10%	a1, a2,a3,a4,b1
5	**Final Practical Exam**	week 14	**20**	20%	c1,c2,c3
6	**Final Theoretical Exam**	week 16	**50**	50%	a1,a2,a3,a4, b1, b2, b3
Total			**100**	**100%**	

IX. Learning Resources:

1- Required Textbook(s):

1. Brooks, G.F.; Carroll, K. C.; Butel, J.S.; Morse, S. A. (2020):**Jawetz, Melnick and Adelberg's Medical Microbiology**. 24th ed.McGraw-Hill.
2. Tortora, Funk, Case (2013). **Microbiology, An Introduction**. 11th ed. Pearson

2- Essential References:

3. Tille, P.M. (2017). **Bailey & Scott's Diagnostic Microbiology**.14th ed. Elsevier
4. Levinson, W (2022). **Review of Medical Microbiology and Immunology**, 17th ed. Lange review series (NY: McGraw-Hill,).

3- Electronic Materials and Web Sites etc.:

Websites:

1. *http://www.microbe.org/microbes/virus_or_bacterium.asp*
2. *http://www.bact.wisc.edu/Bact330/330Lecturetopics*
3. *http://www.mdconsult.com*
4. *http://www.biology.arizona.edu/immunology/microbiology_immunology*

Journals:

1. *Microbiology Journals (Clinical Microbiology Newsletter. Published by Elsevier Science Publishing Company.*
2. *Clinical Microbiology Reviews. Published by American Society for Microbiology.)*
3. *Nature Reviews Immunology*

Other Web Sources:

1. *On-line Mendelian Inheritance in Man, http://gdbwww.gdb.org/omimdoc/omimtop.html*
2. *www.web-books.com/MoBio/Free/Ch8D1.htm*

X. Course Policies: (Based on the Uniform Students' By law (2007)

1	**Class Attendance:** Class Attendance is mandatory. A student is considered absent and shall be banned from taking the final exam if his/her absence exceeds 25% of total classes.
2	**Tardiness:** A student will be considered late if he/she is not in class after 10 minutes of the start time of class.
3	**Exam Attendance/Punctuality:** No student shall be allowed to the exam hall after 30 minutes of the start time, and shall not leave the hall before half of the exam time has passed.
4	**Assignments & Projects:** Assignments and projects must be submitted on time. Students who delay their assignments or projects shall lose the mark allocated for the same.
5	**Cheating:** Cheating is an act of fraud that results in the cancelation of the student's exam or assignment. If it takes place in a final exam, the penalties stipulated for in the Uniform Students' Bylaw (2007) shall apply.
6	**Forgery and Impersonation:** Forgery/Impersonation is an act of fraud that results in the cancelation of the student's exam, assignment or project. If it takes place in a final exam, the penalties stipulated for in the Uniform Students' Bylaw (2007) shall apply**.**
7	**Other policies:** The University official regulations in force will be strictly observed and students shall comply with all rules and regulations of the examination set by the Department, Faculty and University Administration.

Faculty of Medicine

Program of Bachelor of Medicine and Surgery (MBBS)

Course Plan (Syllabus) of Introduction to Microbiology

Course Code. A21P211

I. Information about Faculty Member Responsible for the Course:							
Name of Faculty Member:	Dr. Taha Abdul-Aziz Alnosary	Office Hours					
Location& Telephone No.:	Sanaa-77794004						
E-mail:	Taha_kaid @yhoo.com	SAT	SUN	MON	TUE	WED	THU

2023

II. Course Identification and General Information:

	Course Title:	**Introduction to Microbiology**				
	Course Code:	**A21P211**				
	Credit Hours:	**Credit Hours**	**Theory Contact Hours**		**Practical Contact Hours**	
			Lecture	**Tutorial/Seminar**	**Lab**	**Clinical**
		3	2	--	2	--
	Level/ Semester at which this Course is offered:	2nd Level / 1st Semester				
	Pre –Requisite (if any):	None				
	Co –Requisite (if any):	None				
	Program (s) in which the Course is Offered:	Bachelor of Medicine and Surgery (MBBS)				
	Language of Teaching the Course:	English				
	Location of Teaching the Course:	Faculty of Medicine				
	Prepared by:	Dr. Taha Abdul-Aziz Alnosary				
١١	**Date and Number of Approval by Council:**	٢٠٢٣				

III. Course Description:

Introduction to Microbiology is outline the knowledge to describe the structural components of microorganisms and the functions of these components, and to differentiate between, prokaryotes

eukaryote; also to classify microorganisms and to describe host-parasite relationship, modes of transmission and infection used by microbes, bacterial genetics and gene cloning. As well as to understand the methods of sterilization and disinfection as well as antimicrobial agent and the mechanisms leading to resistance to anti-microbial agents. It is also giving the student's practical skill in uses the different technique and basic identification methods to known the microorganism.

IV. Course Intended Learning Outcomes (CILOs) :

Upon successful completion of the Course, student will be able to:

	A**. Knowledge and Understanding:**
a1	Define major concepts of general microbiology
a2	List the internal, external structure, physical and chemical factors that affect of bacterial.
a3	Explain relationships between hosts and microbes and the pathogenicity of microorganism.
a4	Illustrate methods of sterilization, disinfectant and the antimicrobial chemotherapeutic agents: types, spectra of actions, modes of actions, their clinical use, mechanisms of resistance to antibiotics, and methods of investigation, and control of resistance.
	B**. Intellectual Skills:**
b1	Differentiate between gram positive and gram negative bacteria, DNA and RNA viruses, and superficial mycoses, opportunistic mycoses and systemic mycoses.
b2	Classify the types of sterilization and disinfectant
b3	Analyze the properties, uses, side effects, and mode of action of antibacterial agents.
	C. Professional and Practical Skills:
c1	Use biosafety measured and quality control procedures in the microbiology laboratory to work in a risk-free environment.
c2	Perform the principles of specimen collection, detection, and diagnosis of infections
c3	Prepare calcofluor white stain, lactophenol cotton blue stain, gram stain, biochemical test and serological test to determine the deferent causative microorganism in clinical specimens.
	D. Transferable Skills:
d1	Use effectively different computer skills such as internet, word processing and data sheet to interpret and analysis results and investigation of the diseases.

d2	Work independently or as a member of team effectively and lead teams carrying out various professional tasks and accept the view of others.

I= Introduced, P=Practiced or M/A= Mastered/Advanced

V. Course Contents:

A. Theoretical Aspect:

No.	Units/Topics List	Sub Topics List	Number of Weeks	Contact Hours
1	**Introduction of microbiology**	History	1	2
2	**Differential between prokaryotes, eukaryote**	Definition, bacteria ,virus, fungi	1	2
3	**Bacterial morphology**	Bacterial structure ,function of cell component, spore	1	2
4	**Bacterial physiology**	Microbial growth curve, physical and chemical factors.	1	2
5	**Classification of bacteria and viruses,**	Definition, types of classification methods	1	2
6	**Host-parasite relationship**	Normal flora, pathogen, virulence factors.	1	2
7	**Epidemiological aspects, Transmission source and mode of infection. Pathogenicity and toxigenicity**	Definition of epidemiological aspect, pathogenicity , methods of diseases transmission	1	2
8	**Mid-Term Theoretical Exam**	– MCQs and essay questions	1	2
9	**Normal flora**	Definition ,classification	1	2
10	**Sterilization and disinfection**	Definition and methods	2	4
11	**Bacterial genetics, gene cloning**	Definition, DNA replication ,plasmids and Bacteriophage	1	2
١٢	**Antimicrobial Agents: Therapy and Resistance**	Definition, mechanism of action, complication of antibacterial chemotherapy. Mechanisms of Resistance.	1	2

No.	Units/Topics List	Sub Topics List	Number of Weeks	Contact Hours
١٣	**General properties of viruses**	- History - classification - Replication - pathogenesis, - virulence factors -	1	2
١٤	**Introduction to Medical Mycology**	– Definition – General characters , – Classification of Fungi, – Reproduction of Fungi	1	2
١٥	**Laboratory diagnosis of viral and fungal infections**	– Direct microscopy, – Culture, – Serological tests, – Non-culture methods, – Molecular methods.	1	2
١6	**Final Theoretical Exam**	MCQs and essay questions	1	2
Number of Weeks /and Units Per Semester			**16**	**32**

No.	Units/Topics List	Sub Topics List	Number of Weeks	Contact Hours
1	**Introduction of microbiology**	History	1	2
2	**Differential between prokaryotes, eukaryote**	Definition, bacteria ,virus, fungi	1	2
3	**Bacterial morphology**	Bacterial structure ,function of cell component, spore	1	2
4	**Bacterial physiology**	Microbial growth curve, physical and chemical factors.	1	2
5	**Classification of bacteria and viruses,**	Definition, types of classification methods	1	2
6	**Host-parasite relationship**	Normal flora, pathogen, virulence factors.	1	2
7	**Epidemiological aspects, Transmission source and mode of infection. Pathogenicity and**	Definition of epidemiological aspect, pathogenicity , methods of diseases transmission	1	2

No.	Units/Topics List	Sub Topics List	Number of Weeks	Contact Hours
	toxigenicity			
8	**Mid-Term Theoretical Exam**	– MCQs and essay questions	1	2
9	**Normal flora**	Definition ,classification	1	2
10	**Sterilization and disinfection**	Definition and methods	2	4
11	**Bacterial genetics, gene cloning**	Definition, DNA replication ,plasmids and Bacteriophage	1	2
١٢	**Antimicrobial Agents: Therapy and Resistance**	Definition, mechanism of action, complication of antibacterial chemotherapy. Mechanisms of Resistance.	1	2
١٣	**General properties of viruses**	- History - classification - Replication - pathogenesis, - virulence factors -	1	2
١٤	**Introduction to Medical Mycology**	– Definition – General characters , – Classification of Fungi, – Reproduction of Fungi	1	2
١٥	**Laboratory diagnosis of viral and fungal infections**	– Direct microscopy, – Culture, – Serological tests, – Non-culture methods, – Molecular methods.	1	2
16	**Final Theoretical Exam**	MCQs and essay questions	1	2
Number of Weeks /and Units Per Semester			**16**	**32**

B. Practical Aspect:

No.	Tasks/ Experiments	Number of Weeks	Contact Hours
1	**General information about safety precaution inside the lab**	1	2

No.	Tasks/ Experiments	Number of Weeks	Contact Hours
2	**Sterilization and disinfection methods**	1	2
3	**Instrumentation**	1	2
4	**Staining** Gram stain, simple stains	1	2
5	**Staining** Acid fast stain, Negative staining	1	2
6	**Preparation Of Media** Selective medium and Differential medium	1	2
7	**Mid-semester exam**	1	2
8	- **Preparation Of Biochemical Tests**	1	2
9	- **Preparation Of Sensitivity Test**	1	2
10	- ***Types of Laboratory diagnosis of viral infections***	1	2
11	- Isolation of virus (Tissue culture, Embryonated chicken eggs and Laboratory animals.	1	2
12	- Serological test s for identifying virus “HBs Ag”, “HCV Ab”.	1	2
13	- Laboratory diagnosis methods for identification of ***Mycoses***	1	2
14	- Final Practical Exam	1	2
Number of Weeks /and Units Per Semester		**14**	**28**

No.	Tasks/ Experiments	Number of Weeks	Contact Hours
1	**General information about safety precaution inside the lab**	1	2
2	**Sterilization and disinfection methods**	1	2
3	**Instrumentation**	1	2

No.	Tasks/ Experiments	Number of Weeks	Contact Hours
4	**Staining** Gram stain, simple stains	1	2
5	**Staining** Acid fast stain, Negative staining	1	2
6	**Preparation Of Media** Selective medium and Differential medium	1	2
7	**Mid-semester exam**	1	2
8	- **Preparation Of Biochemical Tests**	1	2
9	- **Preparation Of Sensitivity Test**	1	2
10	- ***Types of Laboratory diagnosis of viral infections***	1	2
11	- Isolation of virus (Tissue culture, Embryonated chicken eggs and Laboratory animals.	1	2
12	- Serological test s for identifying virus “HBs Ag”, “HCV Ab”.	1	2
13	- Laboratory diagnosis methods for identification of ***Mycoses***	1	2
14	- Final Practical Exam	1	2
Number of Weeks /and Units Per Semester		**14**	**28**

C. Tutorial Aspect:

No.	Tutorial	Number of Weeks	Contact Hours
1	NA		
Number of Weeks /and Units Per Semester			

VI. Teaching Strategies of the Course:

خطأ! لم يتم العثور على مصدر المرجع.

VII. Assessment Methods of the Course:

خطأ! لم يتم العثور على مصدر المرجع.

VIII. Assignments:

No.	Assignments	Week Due	Mark
1	**Assignment 1:** Compare between the Gram positive and gram negative cell well	3rd	2
2	**Assignment 2: Types of sterilizing gents**	6th	2
3	**Assignment 3: Types of virulence factors**	10th	**1**
Total			**5**

IX. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment
1	**Assignments**	weeks 3-10	**5**	5%
2	**Quizzes**	week 6	**5**	5%
3	**Mid-Term Practical Exam**	week 7	**10**	10%
4	**Mid-Term Theoretical Exam**	week 8	**10**	10%
5	**Final Practical Exam**	week 14	**20**	20%
6	**Final Theoretical Exam**	week 16	**50**	50%
Total			**100**	**100%**

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment
1	**Assignments**	weeks 3-10	**5**	5%
2	**Quizzes**	week 6	**5**	5%
3	**Mid-Term Practical Exam**	week 7	**10**	10%
4	**Mid-Term Theoretical Exam**	week 8	**10**	10%

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment
5	**Final Practical Exam**	week 14	**20**	20%
6	**Final Theoretical Exam**	week 16	**50**	50%
Total			**100**	**100%**

X. Learning Resources:

1- Required Textbook(s):

Brooks, G.F.; Carroll, K. C.; Butel, J.S.; Morse, S. A. (2020):Jawetz, Melnick and Adelberg's Medical Microbiology. 24th ed.McGraw-Hill.

5. Tortora, Funk, Case (2013). **Microbiology, An Introduction**. 11th ed. Pearson

1. 2- Essential References:

Tille, P.M. (2017). Bailey & Scott's Diagnostic Microbiology.14th ed. Elsevier

6. Levinson, W (2022). **Review of Medical Microbiology and Immunology**, 17th ed. Lange review series (NY: McGraw-Hill,).

1. 3- Electronic Materials and Web Sites etc**.:**

Websites:

http://www.microbe.org/microbes/virus_*or_bacterium.asp*

5. *http://www.bact.wisc.edu/Bact330/330Lecturetopics*
6. *http://www.mdconsult.com*
7. *http://www.biology.arizona.edu/immunology/microbiology_immunology*

Journals:

4. *Microbiology Journals (Clinical Microbiology Newsletter. Published by Elsevier Science Publishing Company.*
5. *Clinical Microbiology Reviews. Published by American Society for Microbiology.)*
6. *Nature Reviews Immunology*

Other Web Sources:

3. *On-line Mendelian Inheritance in Man, http://gdbwww.gdb.org/omimdoc/omimtop.html*
4. *www.web-books.com/MoBio/Free/Ch8D1.htm*

XI. Course Policies: (Based on the Uniform Students' Bylaw (2007)

1	**Class Attendance:** Class Attendance is mandatory. A student is considered absent and shall be banned from taking

	the final exam if his/her absence exceeds 25% of total classes.
2	**Tardiness:** A student will be considered late if he/she is not in class after 10 minutes of the start time of class.
3	**Exam Attendance/Punctuality:** No student shall be allowed to the exam hall after 30 minutes of the start time, and shall not leave the hall before half of the exam time has passed.
4	**Assignments & Projects:** Assignments and projects must be submitted on time. Students who delay their assignments or projects shall lose the mark allocated for the same.
5	**Cheating:** Cheating is an act of fraud that results in the cancelation of the student's exam or assignment. If it takes place in a final exam, the penalties stipulated for in the Uniform Students' Bylaw (2007) shall apply.
6	**Forgery and Impersonation:** Forgery/Impersonation is an act of fraud that results in the cancelation of the student's exam, assignment or project. If it takes place in a final exam, the penalties stipulated for in the Uniform Students' Bylaw (2007) shall apply**.**
7	**Other policies:** The University official regulations in force will be strictly observed and students shall comply with all rules and regulations of the examination set by the Department, Faculty and University Administration.