Republic of Yemen

Ministry of Higher Education & Scientific Research

21 SEPTEMBER UNIVERSITY of MEDICALS & APPLIEED SCIENCES

Faculty of Laboratory medicine..
Department of MICROBIOLOGY & IMMUNOLOGY
Course Specification of Diagnostic Microbiology II
Course No. (03.02.331)
2022/2023

I. Course Identification and General Information:						
1	**Course Title:**	Diagnostic Microbiology II				
2	**Course Code & Number:**	03.02.331				
3	**Credit Hours:**	**Theory Hours**				
		Lecture	**Exercise**	Practical	**Credit Hours**	
		4	0	4	6	
4	**Study Level/ Semester at which this Course is offered:**	4th year / 1st Semester & 2nd Semester				
5	**Pre –Requisite (if any):**	Diagnostic Microbiology II Systemic virology, mycology & bacteriology				
6	**Co –Requisite (if any):**	None				
7	**Program (s) in which the Course is Offered:**	Bachelor in laboratory medicine				
8	**Language of Teaching the Course:**	English				
9	**Study System:**	Semester				
10	**Mode of Delivery:**	Regular				
11	**Location of Teaching the Course:**	University Campus				
12	**Prepared by:**	Dr. Ghamdan AL-tahish				
13	**Date of Approval:**	2022-2023				

II. Course Description	
	It provides students with knowledge on laboratory methods used to diagnose pathogens in clinical

	specimens. Provide in depth Know the procedures used in diagnosis of microbial diseases and Identify different types of microorganisms by using different laboratory techniques. Also the course, will give the students theoretical and practical aspects of microbiological techniques., principles of automation, antimicrobial susceptibility testing, and infection control , their modes of action, host-parasite relationships, and identification of pathogenic and nonpathogenic Gram +ve and -Ve bacteria in clinical specimens. It will also focus on different Mycobacterial species. Each student will be required to identify unknown bacteria in different media.

III. Alignment Course Intended Learning Outcomes with program outcomes

III. Course Intended Learning Outcomes (CILOs)		**Referenced PILOs**	
A. Knowledge and Understanding: ***Upon successful completion of the course, students will be able to:***			
a1	**Discuss** the basic principles of diagnosis of the most likely pathogens and principles of biochemical tests used to identify isolated pathogen.	**A1**	**Discuss** the core aspects of laboratory medicine including Biochemistry. Anatomy. histology. Physiology. Cell Biology. Pathology. Immunology. Microbiology. Epidemiology. and Public Health Medicine
a2	**Demonstrate** the principles of antimicrobial sensitivity testing.	**A2**	**Demonstrate** advanced knowledge of his Laboratory Medicine specialist area; such as genetics. cellular pathology. clinical biochemistry. clinical immunology. hematology and transfusion science. and medical microbiology
B. Intellectual Skills: ***Upon successful completion of the course, students will be able to:***			
b1	**Select the correct** clinical specimen collation in manner, isolation, characterization, and identification. distinguish positive and negative results and choose the appropriate antibiotic for susceptibility testing for isolated pathogens.	**B2**	Develop critical and analytical thinking to recognize errors and solve problems.
C. Professional and Practical Skills: ***Upon successful completion of the course, students will be able to:***			

c1	**Apply** the principles of immunological and molecular techniques for the diagnosis of infectious diseases	**C2**	**Perform** clinical laboratory tests commonly encountered in a hospital laboratory in the areas of Clinical Chemistry. Hematology. Immunohematology. Immunology. Microbiology. Histopathology and. Molecular Diagnostics.
c2	**Perform** clinical specimen collation in correct manner, isolation, characterization, identification. distinguish positive and negative results and choose the appropriate antibiotic for susceptibility testing for isolated pathogen.	**C1**	**Apply** the safety laboratory rules and regulations in handling and processing of test samples and maintaining working environment.
D. Transferable Skills: ***Upon successful completion of the course, students will be able to:***			
d1	**Educate** the population and patients through acceptable customer service interactions, Demonstrate oral and written effective communication skills,	**D1**	Educate the general public and to assist patients through acceptable customer service interactions

III. Alignment Course Intended Learning Outcomes with Teaching Strategies and Assessment methods:

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

	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	**Discuss** the basic principles of diagnosis of the most likely pathogens and principles of biochemical tests used to identify isolated pathogens.	• Interactive lectures • Self-learning • Discussion	• Written exam (mid and final terms and quizzes
a2	**Demonstrate** the principles of antimicrobial sensitivity testing.	• Interactive lectures • Self-learning	• Written exam (mid and final terms and quizzes)

		Discussion	
(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:			
	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	**Select the correct** of clinical specimen collation in manner, isolation, characterization, and identification. distinguish positive and negative results and choose the appropriate antibiotic for susceptibility testing for isolated pathogens.	• Interactive lectures • Practical session • Discussion • Self-learning • Presentation	• Written exam (mid and final terms and quizzes).
C Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:			
	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	**Apply** the principles of immunological and molecular techniques for the diagnosis of infectious diseases	• Practical session • Self-learning	• Written exam (mid and final terms and quizzes). • Final practical exam
c2	**Perform** clinical specimen collation in correct manner, isolation, characterization, identification. distinguish positive and negative results and choose the appropriate antibiotic for susceptibility testing for isolated pathogen.	• Practical session • Self-learning	• Written exam (mid and final terms and quizzes). • Final practical exam
(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:			
	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	**Educate** the population and patients through acceptable customer service interactions, Demonstrate oral and written effective communication skills,	• Seminars • Discussion	• Final practical exam • Final oral exam • Assignment: - Research - Homework

			- Teamwork

IV. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	contact hours	contact hours	Learning Outcomes
1	**Eye Infection:**	Anatomy of eye (Terminology, mechanism of infection, etiology, conventional and rapid diagnostic methods) Blepharitis, keratitis- Corneal ulcer Conjunctivitis- Trachoma **Conjunctival** specimen : collection, transportation, cultivation, identification, susceptibility testing of isolated pathogen and writing final report	1	2	a1,a2,b1,d1
2	**Ear Infections**	Anatomy of ear (Terminology, mechanism of infection, etiology, conventional and rapid diagnostic methods) Otitis media, External ear **Ear specimen** : collection, transportation, cultivation, identification, susceptibility testing of isolated pathogen and writing final report	1	2	a1,a2,b1,d1
3	**Skin and wound infections:**	Anatomy of skin, (Terminology, types and mechanism of infection, etiology, epidemiology, clinical features, conventional and rapid diagnostic methods, Treatment and prevention) Skin Infections Infections of the subcutaneous tissues. Infections of muscle fascia and muscle Diabetic foot infections wound infection Burn ifection4**us specimen**: collection, transportation, cultivation, identification, susceptibility testing of isolated pathogen and writing final report	2	2	a1,a2,b1,d1
5	**Genital tract infections**	Anatomy of male and female genital tract, (Terminology, types and mechanism of infection, etiology, epidemiology, clinical features, conventional and rapid diagnostic methods, Treatment and prevention) (Terminology, mechanism of infection, etiology, conventional and rapid diagnostic methods)	2	2	a1,a2,b1,d1

		Sexually transmitted infections (STI)/ Reproductive tract infections (RTIs) Gonorrhea, *Chlamydia trachomatis* Prostatitis Genital ulcers Vaginal infections Infection transmitted from mother to fetus **Urethral, vaginal, cervical, ulcer genital** specimen: collection, transportation, cultivation, identification, susceptibility testing of isolated pathogen and writing final report			
	MED TERM EXAM				
6	**Central nervous infections:**	Anatomy of CNS, **meninges** (Terminology, types and mechanism of infection, etiology, epidemiology, clinical features, conventional and rapid diagnostic methods, Treatment and prevention) Meningitis Encephalitis Meningoencephalitis: Brain abscess: Bacterial,viral and fungal Meningitis Meningitis in Neonates **CSF specimen:** collection, transportation, cultivation, identification, susceptibility testing of isolated pathogen and writing final report	2	2	a1,a2,b1,d1
7	**Bone infection**	(Terminology, types and mechanism of infection, etiology, epidemiology, clinical features, conventional and rapid diagnostic methods, Treatment and prevention) Acute and chronic Osteomyelitis **Bone marrow aspirate or bone biopsies** : Collection, transportation, cultivation, identification, susceptibility testing of isolated pathogen and writing final report	1	2	a1,a2,b1,d1
8	**Joint infection**	(Terminology, types and mechanism of infection, etiology, epidemiology, clinical features, conventional and rapid diagnostic methods, Treatment and prevention) Septic (infectious) arthritis: Non septic arthritis **Synovial fluid:** Collection, transportation, cultivation, identification, susceptibility testing of isolated pathogen and writing final report	1	2	a1,a2,b1,d1
9	**Serous fluids infection**	Anatomy and physiology of Serous fluids (Terminology, types and mechanism of infection, etiology, epidemiology, clinical features, conventional and rapid diagnostic methods, Treatment and prevention) Empyema pericardial effusion:	1	2	a1,a2,b1,d1

		Ascites **Serous fluids:** Collection, transportation, cultivation, identification, susceptibility testing of isolated pathogen and writing final report			
10	**seminars**	Advances in diagnostics microbiology techniques	2	2	a1,a2,b1,d1
11	**Final exam**		2	2	
	Number of Weeks /and Units Per Semester		**32**	**36**	

B- Practical Aspect

Order	Practical Experiments	Number of Weeks	Contact Hours	Learning Outcomes
LAB 1	**Genital discharges** Collection, transportation, culturing, isolation, identification, staining of particular specimens and antibiotic sensitivity tests.	1	2	,c1,c2
LAB 2	**Pus/wound culture** Collection, transportation, culturing, isolation, identification, staining (Gram & ZN) of particular specimens and antibiotic sensitivity tests.	1	2	,c1,c2
LAB 3	**Blood ,CSF ,Pleural Fluid and Ascitic Fluid** Collection, transportation, culturing, isolation, identification, staining (Gram &ZN) of particular specimens and antibiotic sensitivity tests.	1	2	,c1,c2
LAB 4	Rapid review in diagnosis of common fungal infections - Microscopic examination and culture of specimens in Mycology	1	2	,c1,c2

LAB 5	**Genital discharges** Collection, transportation, culturing, isolation, identification, staining of particular specimens and antibiotic sensitivity tests.	1	2	,c1,c2
LAB 6	**Pus/wound culture** Collection, transportation, culturing, isolation, identification, staining (Gram & ZN) of particular specimens and antibiotic sensitivity tests.	1	2	,c1,c2
LAB 10	Final practical exam	1	2	,c1,c2
Number of Weeks/Contact Hours per Semester		**10**	**20**	,c1,c2

V. Teaching Strategies of the Course:	
1-	Lectures
2- 3 4	Practical session self learning saminar

VI. Assessment Methods of the Course:	
No	**Assignment**

1	Written Exams (Short Essays) and Quizzes
2	Multiple Choice Questions (MCQ)
3	Practical Exams (PE)
4	assignment

VII. Assignments:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
	Assignments		5	5%	d1
1	**Midterm Exam**	8	15	15%	a1,a2,b1
2	**Practical exam**	14	30	30%	c1,c2
3	**Final Exam**	16	50	50%	a1,a2,b1,d1,
	Total	100		100%	

IX. Learning Resources:

1- Required Textbook(s) (maximum two).	
1-	Delost, Maria. (2015). Introduction to Diagnostic Microbiology for the Laboratory Sciences: Jones and Bartlett. ISBN 9781284032314.
2-	Mim's Medical Microbiology. Richard V Goreing, 4th edition (2008); Publisher: Elsevier publications
3.	Oxford Handbook of Infectious Diseases and Microbiology. Second edition. Oxford University Press 2017
2- Essential References.	
1-	Jawetz, Melnick, & Adelberg's Medical Microbiology, 28e **Riedel, Stefan** Published by McGraw-Hill Education, 2019 ISBN 10: 1260012026ISBN 13: 9781260012026
2-	Bailey & Scott's Diagnostic Microbiology 15th Edition Patricia M. Tille- February 4, 2021
3- Electronic Materials and Web Sites *etc*.	
1-	https://sites.google.com/site/allmicrobiologysite/ https://Asm.org
2-	http://medicallabtechno.weebly.com/uploads/7/5/1/5/7515789/monica-cheesbrough district-laboratory-practice-in-tropical-countries-part-1.pdf
3-	https://sites.google.com/site/allmicrobiologysite/diagnostic-medical-microbiology
4-	http://www.microbelibrary.org
	http://www.bact.wisc.edu/Bact330/330Lecturetopics

XI. *Course Policies:*	
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:** -If the student dose not attend for more than 6 times, the student will be obligated to withdrew from the course
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