Republic of Yemen

Ministry of Higher Education & Scientific Research

21 September University of Medical & Applied Sciences

Faculty of Laboratory medicine..

Department of Microbiology & Immunology

Course Specification of Medical Virology
Course No. (03.02.327)
2022/2023

I. Course Identification and General Information:						
1	**Course Title:**	Medical virology				
2	**Course Code & Number:**	03.02.327				
3	**Credit Hours:**	**Theory Hours**				
		Lecture	**Exercise**	Practical	**Credit Hours**	
		2	0	2	3	
4	**Study Level/ Semester at which this Course is offered:**	3rd Level / 1st Semester				
5	**Pre –Requisite (if any):**	General Microbiology, Biochemistry				
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:**	Regulation				
11	**Location of Teaching the Course:**	University Campus				
12	**Prepared by:**	Dr. Ghamdan Ahmed Altahish				
13	**Date of Approval:**	2022-2023				

	A. II. Course Description:
	The course covers the fundamental principles generally related to the virus structure, chemical and physical properties, classification, genetics, replication, pathogenesis, life cycles, transmission, cultivation, laboratory diagnosis and treatment of viruses., prevention and control of diseases caused by viruses. it focuses on medically important individual virus families and groups with more concentration on diseases that are related to viral infections prevalent in our local community than others, such as Hepatitis B viruses, Influenza viruses, Rota viruses

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 pathogenicity, virulence factors and mode of transmission and control and prevention of the different common human viral pathogens	**A1**	**Discuss** the core aspects of laboratory medicine including Biochemistry. Anatomy. histology. Physiology. Cell Biology. Pathology. Immunology. Microbiology. Epidemiology. and Public Health Medicine
B. Intellectual Skills: ***Upon successful completion of the course, students will be able to:***			
b1	**Diagnose common** laboratory diagnostic tests for the different suspected human virology infections.	B2	**Diagnose common** medical conditions affecting various organs of the human body.
C. Professional and Practical Skills: ***Upon successful completion of the course, students will be able to:***			
c1	**Perform** the different laboratory tests for diagnosing viral infections in a safe and effective manner	**C1**	**Perform** clinical laboratory tests commonly encountered in a hospital laboratory in the areas of Clinical Chemistry. Hematology. Immunohematology. Immunology. Microbiology. Histopathology and. Molecular Diagnostics.
D. Transferable Skills: ***Upon successful completion of the course, students will be able to:***			
d1	**Educate** the general public and to assist patients through acceptable customer service interactions	**D1**	**Educate** the general public and to assist patients through acceptable customer service interactions

C. 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 pathogenicity, virulence factors and mode of transmission of the different common human viral pathogens	• Interactive lectures • Self-learning • Discussion	• Written exam (mid and final terms and quizzes)
(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:			
	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	**Diagnose common** laboratory diagnostic tests for the different suspected human virology infections.	• Interactive lectures • Self-learning • Discussion	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	**Perform** the different laboratory tests for diagnosing viral infections in a safe and effective manner	Practical sessions	practical Exams
(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 general public and to assist patients through acceptable customer service interactions	Seminar	Assignment

III. Course Content:					
	A – Theoretical Aspect:				
Order	**Units/Topics List**	**Sub Topics List**	**Number of**	**contact**	**Learning Outcomes (CILOs)**

			Weeks	hours	
1	**General properties of viruses**.	Architecture of viruses: basic components of viruses, virus symmetry, virus genomes, classification and nomenclature of viruses, diseases caused by viruses	1	2	a1,b1,d1
2	**Viral replication and control of viral diseases.**	Virus infection and replication in a host cell: recognition of the host cell, strategies of genomic replication and gene expression in DNA and RNA viruses, control of viral replication, virus assembly, release from the host cell and maturation, genetic variation of viruses. , prevention and antiviral drugs	1	2	a1,b1
3	Viral pathogenesis and **Lab diagnosis**	Pathogenicity of viral diseases, acute, chronic and latent infection, emerging viral diseases Immunopathogenesis Cell Culture and Serology, Molecular Methods Propagation of viruses in the laboratory : Virus isolation in cell cultures, cytopathic effects and identification of viruses	1	2	a1,b1
4	**Herpesviridae:** Herpes simplex1,2 Varicella zoster Cytomegalovirus Epstein-Barr virus HHV6-7-8	Characteristics of viruses , pathogenesis, mode of transmission, types of infection, clinical features of infections, epidemiology, immune response, laboratory diagnosis , treatment, prevention & control .	1	2	a1,b1
5	**Viral hepatitis: hepatitis A,B,C-D and E viruses**	Characteristics of viruses , pathogenesis, mode of transmission, types of infection, clinical features of infections, epidemiology, immune response, laboratory diagnosis , treatment, prevention & control .	1	2	a1,b1
6	**Childhood viral infections** (Measles, Mumps and Rubella)	Characteristics of viruses , pathogenesis, mode of transmission, types of infection, clinical features of	1	2	a1,b1

		infections, epidemiology, immune response, laboratory diagnosis , treatment, prevention & control .			
7	**Mid term**		1	2	a1,b1
8	**Viral gastroenteritis** Rotavirus Norwalk virus Norovirus	Characteristics of viruses , pathogenesis, mode of transmission, types of infection, clinical features of infections, epidemiology, immune response, laboratory diagnosis , treatment, prevention & control .	1	2	a1,b1
9	**Respiratory viruses** **Orthomyxoviruses** Influenza virus **Paramyxoviruses;** Parainfluenza viruses RSV **Coronaviruses**	Characteristics of viruses , pathogenesis, mode of transmission, types of infection, clinical features of infections, epidemiology, immune response, laboratory diagnosis , treatment, prevention & control .	1	2	a1,b1
10	**Picornaviruses** Poliovirus Coxsackie viruses Echoviruses Enterovirus Rhinoviruses	Characteristics of viruses , pathogenesis, mode of transmission, types of infection, clinical features of infections, epidemiology, immune response, laboratory diagnosis , treatment, prevention & control .	1	2	a1,b1
11	**DNA viruses:** Adenoviruses , papillomaviruses, parvovirus B16 , polyomaviruses	Characteristics of viruses , pathogenesis, mode of transmission, types of infection, clinical features of infections, epidemiology, immune response, laboratory diagnosis , treatment, prevention & control .	1	2	a1,b1
12	**Arthropod-borne virus infections** – Dengue and Zika virus Yellow fever virus **Mammalian-borne virus infections** Rabies virus	Characteristics of viruses , pathogenesis, mode of transmission, types of infection, clinical features of infections, epidemiology, immune response, laboratory diagnosis , treatment, prevention & control .	1	2	a1,b1
13	**Retroviruses:** Human immunodeficiency virus (HIV) **Tumor viruses**	Characteristics of viruses , pathogenesis, mode of transmission, types of infection, clinical features of infections, epidemiology, immune response, laboratory diagnosis , treatment, prevention & control .	1	2	a1,b1

		Human cancer viruses with DNA and RNA Oncogens and tumor suppressor genes.			
14	Final exam		1	2	a1,b1
	Number of Weeks /and Units Per Semester		**14**	**28**	

B - Practical Aspect: (if any)				
Order	**Tasks/ Experiments**	**Number of Weeks**	**contact hours**	**Learning Outcomes**
1	**Collection, preservation and transport of virus containing specimens**	1	2	**c1**
2	**Introduction to virology diagnostic techniques** Electron microscope		2	**c1**
3	**Introduction to serological tests used in diagnosis of viral infections: Agglutination and haemagglutination** Direct detection of viral antigens (HBS)	1	**2**	**c1**
4	**Detection of antiviral antibodies (HCV, HIV)**	**1**	**2**	**c1**
5	**Immunofluorescence**	**1**	**2**	**c1**
6	**Enzyme Linked Immune-sorbent Assay (ELISA)**	**1**	**2**	**c1**
7	**Other serological tests (complement fixation, radioimmunoassay (RIA), Western blot)**	**1**	**2**	**c1**
8	**Tissue culture and its use in virus isolation**	**1**	**2**	**c1**
9	**Molecular diagnosis of viral infection** nucliecr acid + sequencing detection of viral nucleic Virus quantitation	**1**	**2**	**c1**
10	**Final exam**	**1**	**2**	**c1**
Number of Weeks /and Units Per Semester		**10**	**20**	

V. Teaching Strategies of the Course:	
1-	Lectures
2-	Practical session
3-	Seminars
4-	Self-learning
5-	Discussion

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
1	**Assignment**		5	5%	d1
2	**Midterm Exam**	8	15	15%	a1,b1
3	**Practical exam**	12	30	30%	c1
4	**Final Exam**	16	50	50%	**a1,b1d1**
	Total	100		100%	

IX. Learning Resources:

· *Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher).*

1- Required Textbook(s)

1-	Carter J.B. and Saunders V.A. Virology, Principle and Applications, ISBN 978-0-470-02386-0
2-	Jawetz, Melnick, & Adelberg's Medical Microbiology, 28e **Riedel, Stefan** Published by McGraw-Hill Education, 2019 ISBN 10: 1260012026ISBN 13: 9781260012026

2- Essential References.

1-	Desselberger U. Medical Virology: a practical approach. 1995. Oxford University Press. Oxford, United Kingdom.
2-	Bailey & Scott's Diagnostic Microbiology 15th Edition Patricia M. Tille- February 4, 2021

3- Electronic Materials and Web Sites *etc*.

1-	http://www.asmusa.org\
2-	http://www.phage.org/black09.htm
3-	http://www.microbe.org/microbes/virus_or_bacterium.asp
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