Course Specifications

General Information

Course name	Medical Virology
Course number	AMSL4333
Faculty	
Department	
Course type	Major Needs
Course level	4
Credit hours (theoretical)	3
Credit hours (practical)	0
Course Prerequisites	

Course Objectives

1 - Introduce the students to the basic structure of viruses
2 - Studying replication, genetics and gene therapy of viruses
3 - Studying classification of medically important viruses
4 - The pathogenesis, host defenses and laboratory diagnosis of viruses
5 - Basic knowledge about antiviral drugs and viral vaccines
6 - Covering all medically important virus families that causes diseases in the human

Intended Learning Outcomes

Knowledge and Understanding	* This course covers both the basic and clinical aspects of virology * Student should understand the structure, replication, classification and pathogenesis of viruses * Complete knowledge about important pathogenic viruses
Intellectual Skills	* Ability to diagnose by laboratory methods the most important pathogenic viruses * Ability to differentiate between different viruses according to its phenotypic characteristics
Professional Skills	* Using the knowledge and skills he/she gained in diagnosis of diseases caused by DNA Enveloped Viruses and DNA Nonenveloped Viruses * Using the knowledge and skills he/she gained in diagnosis of diseases caused by RNA Enveloped Viruses and RNA Nonenveloped Viruses
General Skill	* Ability to discuss this knowledge with professionals * Learn how to work effectively in team work and under pressure

Course Contents

1 - Introduction, structure of viruses
2 - Replication of viruses
3 - Genetics and gene therapy
4 - Classification of medically important viruses
5 - Pathogenesis of medically important viruses
6 - Host defenses against viral infection
7 - Laboratory diagnosis of viral diseases
8 - Antiviral drugs and viral vaccines
9 - DNA Enveloped and Nonenveloped Viruses
10 - RNA Enveloped and Nonenveloped Viruses
11 - Hepatitis Viruses
12 - Arboviruses and Tumor Viruses
13 - Slow Viruses and Prions
14 - Human Immunodeficiency Virus and Minor Viral Pathogens

Teaching and Learning Methods

1 - Lectures
2 - Discussion groups
3 - Case studies

Teaching and Learning Methods for the Disabled Students

1 - None

Students Assessment

Assessment Method	TIME	MARKS
First Midterm Exam	Week 6	20%
Second Midterm Exam	Week 12	20%
Attendance and Quises	Over the semester	10%
Final Exam	Week 16	50%

Books and References

Course note	PowerPoint Presentations
Essential books	Warren Levinson, Review of Medical Microbiology and Immunology, Eleventh Edition 2010. By The McGraw-Hill Companies, New York
Recommended books	Leslie Collier and John Oxford, Human Virology, 2015. By Oxford University Press Inc., New York
	Kayser, Medical Microbiology © 2005, Fritz H. Kayser, M.D.

Knowledge and Skills Matrix

Main Course Contents	Study Week	Knowledge and Understanding	Intellectual Skills	Professional Skills	General Skill
Introduction to viruses and its basic structure	1	To know what is virus and to which kingdom is belong. Also, to learn in details the fine structure of different types of viruses	Ability to differentiate between the structure and shape of DAN and RNA viruses	Full understanding about both conventional and non-conventional viral agents	Comprehen sive knowledge about virion, pseudovirio n, virioid and prions
Replication of viruses	2	Type of replication in viruses	How DNA and RNA viruses replicate in the cell nucleus and/or the cytoplasm	Ability to full understand what means of positive and negative polarity in viruses replication	different replication stratigies that used by virus
Genetics and gene therapy	3	Basic genetics in viruses, type of mutations, mutation repair systems, using of viruses as cloning vectors	How to use viruses to deliver correct genes for treatment of genetic and infectious diseases		Full understandi ng of genetic basis of virology
Classification of medically important viruses	4	Learning the methods used for viral classification including shape, size, nucleic acid structure, capsid arrangement and presence or absence of its envelope			
Pathogenesis of medically important viruses	5	Understanding the mechanisms of pathogenesis for most important human pathogenic viruses	Thinking how viruses cause diseases for us and how they different from bacterial pathogenesis		Student should be able to differentiate between virulence, pthogenecit y, infectivity and disease
Host defenses against viral infection	7	Understanding the physical, natural and acquired immune defenses against viral infections	Basic concepts of natural and acquired immunity	Learning why our body can not fight and give us complete immunity against some viruses	Role of both humoral and cellular immunity in protection us against viral diseases

Laboratory diagnosis of viral diseases	8	Learning different specimens that used for lab. diagnosis of viral infections understanding the importance of laboratory medicine in treatment and management of viral infections	modern molecular techniques used in diagnosis of viral infections	Ability to interpret the findings in cell culture, biochemical and/or molecular diagnostic tests used in virology laboratory	Professional in phenotypic and genotypic diagnosis of viral agents
Antiviral drugs and viral vaccines	9	Understanding the different mechanisms of antiviral agents Knowledge about the families of chemotherapeutic viral agents Studying the types of vaccines	Thinking about the toxicity of antiviral agents on human cells	Differentiate between killed, purified and life attenuated vaccines Right prescription of antiviral chemotherapy	Good knowledge on viral therapeutic agents and vaccines
DNA Enveloped and Nonenveloped Viruses	10	Studying the important families in these classes of viruses from point of its structure, replication, pathogenesis, clinical findings, epidemiology, diagnosis, treatment and prevention	Importance of diseases caused by these families in the community and hospital	Diagnose disease caused by these families in the laboratory Select proper specimen for diagnosis Learn how to prevent spread on community and/or nosocomial viral infections	Get good knowledge on Hepersviruses, Poxviruses and Adenoviruses
RNA Enveloped and Nonenveloped Viruses	11	Studying the important families in these classes of viruses from point of its structure, replication, pathogenesis, clinical findings, epidemiology, diagnosis, treatment and prevention	Important of diseases caused by these family members in both the hospitals and community	Diagnose disease caused by these families in the laboratory Select proper specimen for diagnosis Learn how to prevent spread on community and/or nosocomial viral infections	Get good and enough knowledge on important members of viruses in these families as Orthomyexoviruses and Paramyexoviruses

Hepatitis Viruses	13	Knowledge about different hepatitis families including Hepatitis A, B, C, D, E and G	Importance of infectious hepatitis for health care workers and their role in transmission the disease among the community	Complete and excellent knowledge in the serological and molecular diagnosis of Hepatitis A, B and C	Have the best and up to date information on these so important viral pathogens
Arboviruses and Tumor Viruses, Slow Viruses and Prions	14	Understanding the role of animals in transporting of zoonotic diseases Knowledge about the most important arthropods-borne viral diseases	How prions, which is not viruses considered infectious agents and what its mechanisms in replication		Have good information about the most important arthropod viral diseases as yellow fever and dengue fever
Human Immunodeficiency Virus	15	Understanding the difference between HIV and AIDS Complete knowledge in the life cycle and persistence of HIV infection in human	Why we have not yet vaccine and/or treatment available against AIDS?	Ability to use serological and molecular tests for diagnosis of HIV infection and to differentiate between active and chronic forms of infection	Up to date information on HIV and AIDS