

STUDY GUIDE

Medical Microbiology core course 1212211



Course coordination

Female section

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Male section

Dr. Nawal Salama Gouda (Nawal.Gouda@nbu.edu.sa)

Course Identification

1. Credit hours	4 credits hours
2. Level/year at which this course is offered	2 nd Year; 9 th Semester
3. Pre-requisites for this course	Pass 1 st year

Course committee members

No	Name of the coordinators	Email / ID
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1. Course Description:

The course focuses on the structure and morphology of bacteria, virus, and fungi. The course discusses the epidemiology, pathogenesis, diseases, and prevention of various disease caused by microorganisms. The course illustrates structure and laboratory diagnosis of various infections caused by bacteria, viruses, and fungi. The student will apply knowledge and skill in correlation of the microorganism and disease produced by them which will enable the student to develop concepts and sufficient understanding of the subject to be able to pursue post-graduate studies and continuing medical education.

2. Course Main Objective:

On completion of this course the students should be able to:

1. Differentiate prokaryotic from eukaryotic cells.
2. Explain the general properties of pathogenic micro-organisms (bacteria, viruses, fungi)
3. Recognize the composition and ultra-structure of bacterial, and different bacterial morphology
4. Discuss the basic nutritional and environmental requirements for bacterial growth and the stages of bacterial growth.
5. Understand the microbial genetics, gene function, chromosomal replication, bacterial variation, mutation, transformation, conjugation, and transduction.
6. Identify the basic structure of viruses, its genome and classification.
7. Define the terms associated with fungal structure and reproduction; and classify fungi.
8. Describe epidemiology, pathogenesis, clinical disease, and chemotherapy of infections caused by different types of microorganisms (bacteria, viruses, fungi & prions)
9. Appraise the terminology of sterilization, disinfection, antiseptic, bacteriostatic, bactericidal, and antiseptic techniques, and its usefulness in clinical microbiology.
10. Illustrate various laboratory methods used to diagnose common infectious diseases.

Course Learning Outcomes

CLOs		Aligned-PLOs
1	Knowledge and Understanding	
1.1	Know the morphology, culture characters, and virulence factors of different types of bacteria, virus, and fungus and their induced diseases	K1
1.2	Recognize the principles of health promotion and preventive measures.	K4
1.3	Understand the safety issue related to hospital-acquired infections, injection-induced infections, and sepsis	K2
2	Skills :	
2.1	Use the appropriate laboratory methods to identify the different microbes (staining, microscopy, culture, biochemical tests)	S2
2.2	Apply the core-writing skills to express his knowledge and ideas	S6
3	Values:	
3.1	Employ the skill of self-learning through updated medical information from different approved sources	V1

Course Content

No	List of Topics	Contact Hours
	A. Lectures	
1	Introduction – Structure of bacterial cell (essential structures)	1
2	Structure of bacterial cell (non-essential structures)	1
3	Growth requirements and growth curve	1
4	Bacterial genetics 1	1
5	Bacterial genetics 2	1
6	Antimicrobial agents	1
7	Host parasite relationship	1
8	Staphylococci	1
9	Streptococci – pneumococci	1
10	Neisseria meningitides	1
11	Neisseria gonorrhea	1
12	C. diphtheria	1
13	Anthrax bacillus	1
14	Clostridia-1	1
15	Clostridia-2	1
16	Gram negative bacilli (Lactose fermenters)	1
17	Salmonella	1
18	Shigella – Proteus – Pseudomonas	1
19	Vibrio -Campylobacter – Helicobacter	1

20	Parvo bacteria 1	1
21	Parvo bacteria 2	1
22	Mycobacteria-1	1
23	Mycobacteria-2	1
24	Spirochetes	1
25	Chlamydia – Legionella	1
26	Rickettsia – Mycoplasma	1
27	General mycology	1
28	Cutaneous – subcutaneous mycoses	1
29	Deep mycoses	1
30	Opportunistic mycoses – Anti fungal drugs	1
31	General virology 1	1
32	General virology 2	1
33	DNA viruses (Herpes)	1
34	DNA viruses (Pox)	1
35	DNA viruses (Adeno – Parvo – Papova viruses)	1
36	Picorna viruses	1
37	Orthomyxovirus	1
38	Paramyxo viruses	1
39	Rhabdo V – ARBO viruses	1
40	Retro viruses	1
41	Rota V – Noro V – Astro V.	1
42	Hepatitis viruses – 1	1

43	Hepatitis viruses – 2	1
44	Oncogenic viruses	1
45	Prions	1
	B. Practical's	
46	Safety measures in the laboratory-Microscopes	1
47	Staining of bacteria (Gram stain + ZN stain)	1
48	Sterilization & disinfection	1
49	Culture media	1
50	Biochemical reactions	1
51	Serological diagnosis of infectious diseases	1
52	Antibiotic sensitivity testing	1
53	Cocci (Gram positive & Gram negative)	1
54	Gram positive bacilli	1
55	Gram negative bacilli 1	1
56	Gram negative bacilli 2	1
57	Laboratory diagnosis of fungal infections 1	1
58	Laboratory diagnosis of fungal infections 2	1
59	Laboratory diagnosis of viral infections 1	1
60	Laboratory diagnosis of viral infections 2	1
Total		60

Teaching strategies and Assessment Methods for Students

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge and Understanding		
1.1	Know the morphology, culture characters and virulence factors of different types of bacteria, virus, and fungus and their induced diseases	Direct instructional (Lectures)	-Written exams included MCQs & SAQs.
1.2	Recognize the principles of health promotion and preventive measures.	Direct instructional (Lectures)	-Written exams included MCQs & SAQs.
1.3	Understand the safety issue related to hospital-acquired infections, injection-induced infections, and sepsis	Direct instructional (Lectures)	-Written exams included MCQs & SAQs.
2.0	Skills		
2.1	Use the appropriate laboratory methods to identify the different microbes (staining, microscopy, culture, biochemical tests)	Laboratory-based learning strategy (Demonstration, direct instruction, cooperative)	OSPE
2.2	Apply the core-writing skills to express his knowledge and ideas	Homework-assignment	Assignment rubric
3.0	Values		
3.1	Employ the skill of self-learning through updated medical information from different approved sources	Homework-assignment	Assignment rubric

Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Midterm	6 th	25%
2	Assignment	8 th	15%
3	Final exam	End of semester	40%
4	OSPE	End of semester	20%

Learning Resources

Required Textbooks	<p>-Lippincott's Illustrated Review of Microbiology: By Cynthia Nau Cornelissen, Marcia Metzgar Hobbs. Lippincott's Williams & Wilkins. Fourth edition.</p> <p>-Lippincott's Illustrated Review of Immunology: Thao Doan, Roger Melvold, Susan Viselli & Carl Waltenbaugh; Lippincott's Williams & Wilkins. Second edition.</p> <p>-Textbook of Diagnostic Microbiology. By Connie R Mahon, Donald C Lehman, George Manuselis. Publisher: Elsevier. Fifth edition.</p>
Essential References Materials	Jawetz Melnick & Adelbergs. Medical Microbiology. By Karen C. Carroll, Janet S. Butel, Stephen A. Morse. 27 th Edition
Electronic Materials	Other learning materials such as computer-based programs/CDs, professional standards or regulations, and software.
Other Learning Materials	Power points.