

Course Specification of Microbiology and Immunology for master of Hepatobiliary Surgery

A- Administrative Information

Course Title: Microbiology and Immunology

Code: SURG H716

Department giving the course: Medical Microbiology and Immunology

Program on which the course is given: Master Of Hepatobiliary Surgery

Department offering the Program: Hepatobiliary Surgery

Academic level : 1st part

Date of approval by Departmental and NLI Council: 2011

B-Professional Information

1 – Overall aims of course:

The aim of this course is to provide the postgraduate student with the advanced medical knowledge and skills essential for the Diplomay of practice of specialty and necessary to provide further

training and practice in the field of Medical Microbiology& Immunology

2 – Intended learning outcomes of course (ILOs)

A -Knowledge and Understanding:

At the end of the course the student should be able to

a1-Illustrate the nature of Viruses, bacteria and fungi and basic criteria used in the Classification /

taxonomy

a2-Demonstrate modes of transmission and the mechanisms of microbial pathogenesis and the

outcomes of infection, including chronic microbial infections

a3-Diagnose different microbial diseases by using different laboratory techniques, including the

isolation and characterization of specific microbes in clinical specimens

a4- Describe a range of advanced laboratory techniques, including the purification of isolated

microbial pathogens, review of microbial growth cycles and analyses of their proteins and nucleic

acids for downstream applications such as gene cloning and sequencing studies

a 5- Describe how the pathogen in the environment, could be eliminated from medical equipment

and devices and in order to provide safe healthcare.

a 6- Clarify treatment of infection caused by the pathogen.

a7- Outline infection control policies and issues of patient safety.

a8- Describe infection control procedures and sterilization methods.

a9- Analyze immunological etiology of diseases.

a10- List types of immunity and it's beneficial or harmful.

b- Intellectual Skills

At the end of the course the student should be able to

b1- Plan an appropriate investigation scheme for individuals at risk of infection

b2- Produce accurate reports with clear conclusions

b3- Assess health risk factors associated with working in a research diagnostic laboratory

b5- Interpret treatment regimens used for managing microbial and immunological diseases.

b6- Illustrate suitable vaccines for individual infectious or immunological disease.

c- Professional and Practical Skills

At the end of the course the student should be able to

c1- perform diagnostic laboratory tests in medical bacteriology, virology, mycology and immunology.

c2- Perform biomedical laboratory techniques in accordance with health and safety guidelines.

c3- Perform quality control and assurance procedures

c4- prepare laboratory reports.

c5- Perform the isolation and characterization of specific microbes in clinical specimens.

Identify

the pathogen by its specific growth characteristics if any, distinguishing biochemical tests, its

morphological and/or staining characteristics, immunological or nucleic acid-based tests

d- General and Transferable Skills

At the end of the course the student should be able to

d1- Demonstrate communication and presentation skills.

d2- Demonstrate teamwork and interpersonal skills.

d3- Demonstrate competence and problem solving techniques.

d4- integrate and evaluate information from a variety of sources.

3- Course contents

Detailed topics of the course

I- General Bacteriology:

- Bacterial morphology and ultra structure
- Bacterial physiology
- Microbial genetics
- Advanced molecular techniques and its application in diagnostic microbiology
- Sterilization
- Antimicrobial agents and chemotherapy

II- Immunology

- Host parasite relationship
- Innate immunity
- Antigens
- Cells of innate and acquired immunity
- Acquired immune response
- Immunoglobulins
- Complement system
- Antigen - antibody reactions
- Immune system in health and disease
- Host defense against infection
- Host response against cancer
- Hypersensitivity
- Tolerance and autoimmunity
- Transplantation and graft rejection-immunodeficiency

III- Systematic Bacteriology

- Staphylococci
- Streptococci including *Streptococcus pneumoniae*
- Neisseria
- Spore forming organisms
- *Corynebacteria* and *Listeria*
- Spore forming organisms
- Mycobacteria
- Enterobacteriaceae

- Vibrios, Campylobacter and Helicobacter
- Brucella, Haemophilus, Bordetella, Yersinia
- Mycoplasma and Legionella
- Spirochaetes-Bacteroids, Actinomyces, Nocardia
- Rickettsia and Chlamydiae
- Anaerobic bacteria

IV- Mycology:

- Fungal taxonomy;
- Superficial and systemic fungal infection;
- Diagnosis of fungal infection
- Fungal pathogenicity
- Antifungal chemotherapy.

V-Virology

- Viral structure
- Pathogenesis of viral infections.
- Laboratory diagnosis of viral infections.
- Diseases caused by enveloped viruses
- Diseases caused by non-enveloped viruses.
- Tumor viruses and oncogenesis.
- Slow virus infections and prions infections.

VI-Applied Microbiology (Hospital acquired infections)

B- PRACTICAL COURSES:

- Safety measures that should be taken in the lab
- Media and Bacterial Cultivation
- Culture Characteristics
- Biochemical reactions for bacterial identification
- Serological tests: Complement fixation test and Radial immunodiffusion. Widal test, tube agglutination test for brucellosis and Antistreptolysin o test.
- Systematic Microbiology: For each organism the practical class will consist of 3parts
Demonstration of stained films
Demonstration of pure culture on different appropriate media
Tests for bacterial identification
Infection Control
- Mycology: Gram staining of films prepared from culture of Candida albicans on Sabouraud' s agar.

Topic	Theoretical hours	Laboratory/ Practical	Total
A- First Part : 1- Basic Pharmacology - introduction. dosage forms of drugs, routes of drug administration, evaluation of new drugs, prescription writing, adverse drug reaction, pharmacokinetics, pharmacodynamics,	1	0.5	1.5

influence of disease on pharmacokinetics and pharmacodynamics, Drugs at the extremes of age, drug interaction			
B- Second Part : 1- Autonomic Nervous System - Basic anatomy and physiology, molecular mechanism of neurotransmitter actions, adrenergic transmission, cholinergic transmission, skeletal muscles relaxants, drugs acting on autonomic ganglia , drugs acting on the eye 2- Autacoids	1	1	2
3- cardiovascular system -drugs therapy of heart failure, drugs therapy of hypertension - drugs therapy of angina pectoris - drugs therapy of acute myocardial infarction - drugs therapy of cardiac arrhythmia - drugs therapy of peripheral vascular diseases - treatment of shock and hypotensive state	1	1	2
4- renal pharmacology - physiological consideration - diuretics - alteration of urinary pH	1	0.5	1.5
5- Pharmacology of blood	1	0.5	1.5

<ul style="list-style-type: none"> - treatment of anaemias - drugs affecting haemastasis - lipid lowering drugs - intravenous fluids 			
6- Chemotherapy <ul style="list-style-type: none"> -classification of antimicrobials - adverse reactions of antimicrobials - general principles of chemotherapy - drug therapy of T.B - treatment of leprosy - prophylactic antibiotics - antifungal drugs - antiviral drugs - cancer chemotherapy - immunomodulating agents - topical disinfectants,antiseptics - antiprotozoal drugs - antihelminthic drugs 	1	1	2
7- Central Nervous system <ul style="list-style-type: none"> - CNS neurotransmitters - sedative-hypnotics and anxiolytics - antiepileptic drugs - analgesic drugs - drug therapy of rheumatic fever - drug therapy of gout - drug therapy of reumatoid arthritis - local anaesthetics - pre-anathesia medication - antiphycotics - antidepressant - antimanic drugs - central nervous stimulants 	1	1	2
8- Respiratory System <ul style="list-style-type: none"> - drug therapy of bronchial asthma - drugs used for cough - therapeutic gases 	1	1	2
9- pharmacology of	1	1	2

Endocrine System - classification of hormones - mechanism of hormonal action - anterior pituitary hormones - posterior pituitary hormones - drug therapy of diabetes mellitus - thyroid hormones and antithyroid drugs - hormonal regulation of calcium metabolism - adrenocorticosteroids - sex hormones			
10- Pharmacology of GIT - drug therapy of peptic ulcer - emetics and antiemetics - prokinetic drugs - medical treatment of gall stones - digestive aids - purgatives - antidiarrheal agents	1	1	2
11- Miscellaneous Topics - gene therapy - vitamins - dermatological pharmacology	1	0.5	1.5
Total hours	2	1	3

4– Teaching and learning methods

- 4.1- Lectures
- 4.2- group discussion
- 4.3.problem solving

5- Student assessment methods

- 5.1- Written Examination for assessment of knowledge and understanding and intellectual skills
- 5.2- Oral Examination for assessment of knowledge and understanding outcomes, intellectual skills, general skills and attitude.

Assessment schedule

One written exam one and half hours in Medical Microbiology and Immunology + oral + practical

exam.

Assessment weighing

Written exam: 50% Oral exam: 25 Practical exam: 25%

6- List of references:

6.1 course notes:

Department notes

6.2-Essential books (text):

Jawetz, Melnick and Adelberg's Medical Microbiology

6.3- Recommended books:

6.4. periodicals and web sites of Microbiology and Immunology

http://www.microbe.org/microbes/virus_or_bacterium.asp

<http://www.bact.wisc.edu/Bact330/330Lecturetopics>

7- Other Resources / Facilities required for teaching and learning to achieve the above ILOs

Overhead projectors, Computers, Microscope slides, Laboratories instruments, Internet club

We certify that all of the information required to deliver this course is contained in the above

specification and will be implemented

Course coordinator: Prof . Enas Ghionem

Head of Department: Prof. Dr.Enas Ghonem