

Course information

Course title	Cardiovascular System
Course number	111501206
Credit hours	6 Credits
Course date	5 WEEKS / SEMESTER 2 / YEAR 2
Course meeting time	Second Semester
Course location	Second year students
Instructor	Dr. Raith A. S. Al-Saffar; MSc; PhD.; RaithAlSaffar@yahoo. Com
Pre-requested course	Successful transfer from first year

Course description:

This system-based integrated module gives a comprehensive overview of cardiovascular system. Each of the basic science topics are incorporated into an integrated body of knowledge covering anatomy including the developmental anatomy as well as the congenital anomalies, histology, and physiology of the cardiovascular system. It also includes the biochemical and pathological prevention methods of those diseases. Lastly concentrate on some common cardiovascular diseases as hypertension, ischemic heart disease and arrhythmia.

Learning outcomes:

Upon completion of this course students should be able to:

1. Identify the anatomy of the mediastinum; heart borders, surfaces, chambers, and valves; and general and topographic of the great vessels and their distribution.
2. Describe the microscopic appearance of different parts of the cardiovascular system.
3. Describe the normal embryological development with their common congenital abnormalities.
4. Describe and understand the electrocardiogram cardiac cycle, hemodynamics, regulation of blood flow and blood pressure, microcirculations, and the mechanism of circulatory shock.
5. Understand the metabolism of the cardiac muscles and the value of cardiac enzymes and Troponins and their role in the diagnosis of acute myocardial disease.
6. Recognize the role and types of lipoprotein disorders and the mechanism of formation of atherosclerosis.
7. Recognize the characteristics of microorganisms that cause infection of the cardiovascular system, their pathogenicity and methods of identification.
8. Define with the more common types of cardiovascular diseases with emphasis on (etiology, mechanism and briefly to correlate the pathological aspects of diseases with clinical manifestations).
9. Understand the mechanisms of action, pharmacokinetics, uses and adverse effects of commonly used drugs in the treatment of cardiac failure, cardiac arrhythmias, hypertension, angina and drugs used in hyperlipidemias.
10. Recognize the major cardiovascular risk factors in health and diseases.
11. Identify the nutritional and dietetic components in the etiology, management, and prevention of cardiovascular diseases.

Instructional methods:

- Lectures.
- Practical.

Text book and material:

***ANATOMY:**

Author	Title	Published Year
G.J. Tortora,	Principle of Human Anatomy.	Last edition.
R.S. Snell.	Clinical Anatomy for Medical Students.	Last edition
Carlos Junqueira. Last edition	Basic Histology	Last edition
K.L. Moore and T.V.N. Persaud	Before we are born	Last edition
Frank H. Netter	Atlas of Human Anatomy	Last edition
Anne M. R. Agur and Arthur F. Dalley	Grants Atlas of Anatomy	Last edition

***BIOCHEMISTRY:**

Author	Title	Published Year
Robert K. Murray and Co.	Harper's Biochemistry	Last edition.

***PHYSIOLOGY:**

Author	Title	Published Year
Guyton and Hall	Textbook of Medical Physiology	Last edition.
William F. Ganong	Review of Medical Physiology	Last edition

***PATHOLOGY:**

Author	Title	Published Year
Emanuel rubin	Essential Pathology	Last edition.
Kumar, Cotran and Robbin	Basic Pathology	Last edition

***PHARMACOLOGY:**

Author	Title	Published Year
Lipincott's	Illustrated Review: Pharmacology	Last edition.

*** In addition the students are advised to go back to internet resources.**

Grading Policy:

Grades can be based on the following:

Assignments: First in-course exam: Theory = 40%; Practical pract= 20%

Final Exam: %

Class attendance/participation: %

Total Points 100

Course Policies:

- **Late Assignments:** Students must give an explanation to the course instructor for any assignment which is submitted late. It will be at the course instructor's discretion if marks will be deducted for late assignments..
- **Missed exam:** If a student misses an examination then they will have the opportunity for a make-up examination, according to the university regulations.
- **Absence:** If a student is absent for a teaching session then they must discuss this with the course instructor. If a student is absent for more than 25% of the course then he may be liable to fail the course.
- **Cheating:** Cheating is forbidden in any form. Any students who are caught cheating will be reported to the medical Dean and further action taken as necessary.

Classroom Protocol:

Students are expected to attend all sessions and to arrive on time for lectures and practical sessions. It is each student's responsibility to know their timetable and which session they should attend on which day. Students are expected to behave respectfully towards all members of staff and each other. Mobile phones are to be switched off during teaching sessions and eating, drinking and smoking are forbidden.

Important Dates to Remember:

Lectures will begin the first week of the semester.

Practical sessions will begin the second week of the semester.

The dates and locations of written and practical examinations will notified at the beginning of the semester.

Student rights and responsibilities:

These are as detailed in University Regulations.

Course Schedule :

After studying the material covered in the lectures, practical's, seminars and internet search regarding this module, the student is expected to express the following specific capacities:

A. LECTURES		
Contents of Anatomy Lectures		
No	Title	Objectives
1	Mediastinum & Pericardium.	1. Study the parts and contents of mediastinum. 2. Describe the outline and normal position of the heart. 3. Identify and list relations of different parts of the heart in the middle mediastinum. 4. Define the pericardium and describe its covering layers. 5. Describe its attachment to the diaphragm and

		the root of the great vessels. 6. Discuss the pericardial space and sinuses. 7. Discuss the pericardial fluid in normal condition. 8. Describe innervations of the fibrous pericardium.
2	Heart chambers, valves, conductive system and innervations of the heart.	1. Describe the location, shape, borders, surfaces, sulci, surface landmarks, and relations of heart. 2. Describe divisions of the heart into four chambers and the internal features of each chamber. 3. Describe the fibrous skeleton of Heart. 4. Identify papillary muscles and describe their locations and importance. 5. Describe the atrioventricular, pulmonary, aortic, and semilunar (pulmonary and aortic) valves, their position, functional importance, surface marking and ideal sites for their auscultation. 6. Describe the surface anatomy of great vessels entering and leaving the heart. 7. Describe different parts of the conductive system of the heart and their arrangement and function within the myocardium. 8. Understand and describe the principal of cardiac referred pain.
3	Blood supply & great vessels of the heart.	1. Describe the origin of the right and left coronary arteries and their course, branches and distribution. 2. Describe sites of anastomosis between branches of coronary arteries. 3. Describe the normal variation in the course of the coronary arteries and their branches. 4. Describe the venous drainage of the heart and cardiac veins (their names, location and drainage areas). 5. Describe the location and termination of the coronary sinus and its tributaries.
4	Histology of the myocardium and blood vessels	1. Describe the microscopic structure of the cardiac muscle and the histological appearance of the intercalated disc and Purkinje fibers. 2. Describe the histological features of the endocardium, and epicardium. 3. Describe the histological appearance of arteries and veins and their differences. 4. Describe the ultra structural features of different

		types of capillaries.
5	Blood vessels I – Arterial system: a. Arteries in the head and neck regions.	1. Describe the course, relations and branches of the ascending aorta and arch of aorta. 2. Describe the common carotid, and external and internal carotid arteries concerning with their course, relations and branches.
6	Blood vessels I – Arterial system: b. Arteries in the thorax, abdomen and pelvis regions.	1. Describe the course, relation and branches of the descending thoracic aorta. 2. Describe the course, relations and branches of the descending abdominal aorta. 3. Describe the course, relations and branches of the common iliac artery. 4. Describe the course, relations and branches of the internal iliac artery. 5. Describe the course, relations and branches of the external iliac artery.
7	Blood Vessels I – Arterial system: c. Arteries in the upper Limb region.	1. Describe the course, relations and branches of the axillary artery. 2. Describe the course, relations and branches of the brachial artery. 3. Describe the anastomosis around the shoulder and scapula. 4. Describe the course, relation and branches of the radial artery. 5. Describe the course, relation and branches of the ulnar artery. 6. Describe the anastomosis around the elbow and wrist joints. 7. Describe the locations and branches of the superficial and deep palmar arches.
8	Blood vessels I – Arterial system: d. Arteries in the lower limb region.	1. Describe the course, relations and branches of the femoral artery. 2. Describe the course, relations and branches of the profunda femoris artery. 3. Describe the course, relations and branches of the popliteal artery. 4. Describe the cruceate and trochanteric

		anastomosis. - Describe the course, relations and branches of the anterior tibial artery. - Describe the course, relations and branches of the posterior tibial artery. - Describe the anastomosis around the knee joint. - Describe the course, relations and branches of the dorsalis pedis, medial plantar and lateral plantar arteries. - Describe the location and branches of the plantar arch.
9	Blood vessels II – Venous system.	- Describe the caval system (course and relations of superior and inferior vena cava). - Describe tributaries of the superior vena cava draining the head, neck and upper limb. - Describe tributaries of the inferior vena cava draining the abdomen, pelvis and lower limbs. - Describe the azygos system and its drainage area. - Describe the important surface landmarks of major veins from clinical point of view. - Describe the portal venous system. - Describe cavo-caval and porto-caval anastomosis.
10	Development of the heart.	- Describe the primary formation and folding of the heart. - Describe the formation of different chambers of the heart. - Understand and describe the establishment of fetal circulation and its hemodynamics and subsequent cardiovascular changes that take place after birth. - Describe and understand causes of major malformation incurred during these developmental stage and their clinical implications.
11	Development of the vascular system	Describe the formation of dorsal aorta. Describe the formation of aortic arches and their fate. Revise the process of transformation of fetal into adult circulation and the major changes that occur. Describe major congenital malformations incurred during these stages and their clinical implications.

Contents of Phsiology Lectures

No	Title	Objectives
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1	Functional design of the CVS	1. Describe the basic function of the CVS. 2. Explain how structural differences of various parts of CVS subserve their functions. 3. Describe the systemic and pulmonary circulations. 4. Describe blood velocity & blood flow through various parts of CVS in relation to their cross sectional area.
2	Properties of cardiac muscle	1. Describe automaticity and conduction of the conductive system of the heart; the control role of the ANS. 2. Describe cardiac muscle action potential. 3. Describe certain fundamental properties of cardiac muscle such as conductivity, refractory period and excitation contraction coupling.
3	The electrocardiogram I	1. Describe the principles of voltage recording in a volume conductor and its application to recording from the heart. 2. Explain ECG waveforms and intervals in relation to the instantaneous pathway of waves of depolarization through the cardiac muscle. 3. Voltage and time calibration of the ECG. 4. Explain the normal ECG.
4	The electrocardiogram II	1. Describe methods of recording ECG. 2. Explain the differences in QRST configuration in various leads. 3. State the right and left deviations of the electrical axis of the heart.
5	The electrocardiogram III	Cardiac arrhythmias: a. Changes in the function of the sinus node. b. Disturbances in the conduction of impulses. c. Ectopic foci.
6	The electrocardiogram IV	ECG interpretation of cardiac muscle ischemia: a. Anterior wall infarct. b. Posterior wall infarct. c. Infarction involves other area of the heart.

7	Mechanical events in cardiac cycle	1. Define cardiac cycle. 2. Give Ganong's curves for the various events occurring in the heart, inlet veins, outlet arteries and explain: a. Systolic and diastolic duration. b. Isometric & relaxation and the ejection phases. c. Volume – pressure relationship in the left ventricle. d. The development of first and second heart sounds. 3. Define murmurs and how systolic and diastolic murmurs are produced.
8	Cardiac output and its regulation I	1. Define cardiac output and cardiac index. 2. Methods of determination of cardiac output. 3. Describe the relationship between cardiac output, stroke volume and the heart rate. 4. Describe how stimulation of the sympathetic & parasympathetic affect the cardiac output.
9	Cardiac output and its regulation II	1. Explain the relationship between EDV & ventricular performance (Frank-Starling curve). 2. Describe factors affecting EDV & define cardiac reserve. 3. Describe the effect of ANS, and ions on the pumping activity of the heart. 4. Describe the energy expended & O₂ utilization by the heart.
10	Hemodynamic	1. Define hydrostatic pressure and compare the magnitude of arterial pressure in the head and feet in the recumbent and standing position. 2. Describe factors affecting the peripheral resistance. 3. How the vascular resistance affect blood flow. 4. Factors determine laminar and turbulent blood flow. 5. The application of Laplace law.
11	Blood pressure and its regulation I	1. Define blood pressure and state that it is determined by the cardiac output and total peripheral resistance. 2. Define systolic, diastolic, pulse, and mean pressure and give their normal values. 3. State that the central nervous mechanisms regulating blood pressure are comprised of: vasomotor center, the afferent influences on the center from baroreceptor, chemoreceptor, higher parts of the CNS, stretchreceptor in the right atrium etc. 4. State that regulation is achieved by changing:

		peripheral resistance, venous capacity, heart rate, and stroke volume.
12	Blood pressure regulation II	1. Discuss the long term regulation of blood pressure. 2. Discuss the role of renin-angiotensin, and aldosterone in regulation of blood pressure.
13	Hypertension	1. Define hypertension. 2. Discuss the essential and secondary hypertension. 3. Effects of hypertension on the body.
14	Tissue blood flow	1. Recognize factors which control blood flow. 2. Autoregulation: its definition, tissues exhibit autoregulation, its myogenic & metabolic theories. 3. Discuss agents normally found in the body that cause vasoconstriction & vasodilation.
15	Coronary circulation	1. Structural & functional adaptation to match high O₂ requirement. 2. Metabolic hyperaemia is the dominant control of coronary circulation. 3. Coronary vasomotor nerve. 4. Mechanical obstruction to coronary blood flow during systole. 5. The mechanisms of arrhythmias and decrease in cardiac contractility in cardiac ischemia.
16	Heart failure & circulatory shock	1. Definition of heart failure (HF). 2. Hemodynamic changes in compensated and decompensated HF. 3. Physiological bases of the manifestations of left and right side failure. 4. Physiological bases of treatment of HF. Describe cardiogenic, hypovolumic shock.
17	Exercise	1. Describe muscular blood flow during exercise. 2. Discuss circulatory adjustment during exercise. 3. Discuss the relationship of cardiovascular performance to the level of O₂ consumption during exercise.

Contents of Microbiology Lectures

No	Title	Objective
1	Microbiology of carditis.	1. Understand the characteristics of microorganisms that cause infection of the cardiovascular system: their pathogenicity and methods of identification. 2. Understand the role of streptococcus viridians in endocarditic. 3. Understand the role of streptococcus pyogenes in rheumatic fever.

Contents of Biochemistry Lectures

No	Title	Objective
1	Metabolism of cardiac muscles.	1. Major sources of energy for the cardiac muscles. 2. Discuss ketone body synthesis & utilization during starvation. 3. Discuss lactate metabolism in hypoxic heart muscle. 4. Describe how hypoxia influence serum and tissue lactate level.
2	Plasma cholesterol.	1. Discuss cholesterol metabolism and its role in a a. Atherosclerosis. b. Appreciate the main regulatory factors of cholesterol metabolism and its serum levels.
3	Plasma lipoproteins.	1. Describe different types of lipoproteins, their function and metabolism. 2. Discuss the LDL receptor and the mechanism of internalization of cholesterol in the cell. 3. Discuss the molecular basis of atherosclerotic plaque formation. 4. Describe various types of familial hyperlipidemias according to WHO classification.
4	Heart attack.	1. Know the new tests to detect the risk groups for heart attack. 2. CR, Fibrinogen, lipoproteins a & b, and Homocystein.
5	Cardiac enzymes and the troponins.	1. Discuss the clinical relevance of CPK, CK-MB, AST and LDH in diagnosis of cardiac diseases. 2. Discuss Myoglobin & Troponins as a marker for myocardial infarction.

Contents of Pathology Lectures

No	Title	Objectives
1	Atherosclerosis & Hypertensive vascular diseases.	1. Discuss the epidemiology, the predisposing factors for atherosclerosis, including the hyperlipidemia & familial predisposition. 2. Describe the macroscopic & microscopic features of atherosclerosis. 3. Define hypertension and discuss the hemodynamic variables involved in the causation of hypertension. 4. Discuss the pathogenesis & the predisposing factors. 5. Also describe the macroscopic & microscopic features of hypertensive vascular diseases.
2	Aneurysm, vasculitis & varicose veins.	1. Define aneurysm and enumerate the types of aneurysm, including congenital or acquired aneurysms, false or true aneurysms ...etc .Mention the location of various types of aneurysms like abdominal atherosclerotic aortic aneurysm (AAA) or syphilitic aneurysm or berry aneurysm. Discuss their pathogenesis & mention the gross & microscopic features. 2. Enumerate the types & causation of vasculitis. Mention their locations & pathological and clinical features. 3. Discuss the pathogenesis of varicose veins, mention their location and describe the morphological features and complications.
3	Lung tumors	1. Enumerate the benign & malignant tumors of blood vessels. Describe the gross & microscopic features of each type and their pathogenesis and most common location. 2. Discuss & enumerate the types of Kaposi's sarcoma, mentioning their relations to AIDS and HIV infection. Also describe the gross & microscopic & clinical features of each type. 3. Discuss angiosarcoma, its relation to carcinogenic agents, their most common location, and their gross & microscopic features.
4	Ischemic heart diseases.	1. Discuss the etiology & predisposing factors for ischemic heart diseases. Mention the etiology, the pathogenesis and morphological appearances of myocardial infarction, and its complications. 2. Discuss the subendocardial infarction, its

		pathogenesis, and the gross & microscopic appearances.
5	Rheumatic Heart disease, endocarditis & valve lesions.	1. Define & describe causation of rheumatic heart diseases and describe the gross and microscopic features. 2. Mention the major and the minor Jones's criteria of rheumatic heart disease. 3. Discuss & enumerate the types of cardiac valve lesions. Mention the etiological causes, their gross & microscopic features.
6	Cardiomyopathy, myocarditis, pericarditis, and benign and malignant tumors of the heart.	1. Define cardiomyopathy. Mention their types, pathogenesis, their pathological gross, microscopic & ultrastructural features as well as the clinical features. 2. Discuss myocarditis. Mention their causes, pathogenesis & pathological features of each type. 3. Discuss pericarditis, causes and appearances of pericardial effusion, empyema & hemopericardium. 4. Enumerate the types of benign & malignant tumors of the heart. Discuss their location and morphological features.

Contents of pharmacology Lectures

No	Title	Objectives
1	Antihypertensive agents.	Classify antihypertensive agents as: 1. Diuretics-discussed before. 2. Sympatholytic Agents: a. α-adrenergic blockers: Prazosin. b. β-adrenergic blockers: Propranolol, Atenolol. c. Mixed adrenergic blockers: Labetalol. d. Adrenergic neurone blockers: Guanethidine, Reserpine. e. Centrally-acting sympathoplegic drugs: Methyldopa and Clonidine. 3. Vasodilators: Hydralazine, Minoxidil, Diazoxide, Sodium Nitroprusside. 4. Calcium channel blockers: Dihydropyridines (Nifedipine, Nicardipine, Amlodipine, etc.) Verapamil, Diltiazem and Bepridil. 5. Inhibitors of the Renin-aldosterone-angiotensin system.

		a. Angiotensin-converting enzyme (ACE) inhibitors (Captopril, Enalapril, Lisinopril). b. Angiotensin receptor blockers (Losartan).
2	Antianginal Drugs.	1. Classify antianginal drugs into: a. β-adrenergic blockers. b. Nitrates and nitrites. c. Calcium channel blockers. 2. Classify nitrates and nitrites according to route of administration and duration of action. 3. Discuss their pharmacological actions, adverse effects and clinical uses. 4. Classify Calcium Channel Blockers into: a. Dihydropyridines: Nifedipine, nicardipine, nitrendipine... etc. b. Verapamil. c. Diltiazem. d. Bepridil. 5. Compare these drugs regarding their pharmacological and hemodynamic effects, adverse effects and clinical indications.
3	Cardiac glycosides and drugs used in heart failure.	These two lectures will cover two classes of drugs: A. Digitalis B. ACE Inhibitors and Angiotensin Receptor Antagonists. C. Dobutamine. 1. Discuss the mechanism of action of cardiac glycosides (digoxin & digitoxin) as inhibitors of Na^+/K^+, ATPase and as cardioselective parasympathomimetics. 2. Discuss their pharmacological and adverse effects. 3. List the interactions of digitalis with other drugs. 4. Emphasize factors that enhance digitalis toxicity. 5. Identify the use of digitalis in chronic versus acute heart failure and supraventricular tachyarrhythmias. 6. Identify differences in the pharmacokinetic profiles of digoxin and digitoxin and their implications on patient care. 7. Discuss ACE Inhibitors regarding their pharmacological actions, adverse effects, precautions and therapeutic indications. 8. Discuss the role of dobutamine in heart failure.
4	Drugs used in cardiac	Classify these drugs into:

	arrhythmias.	1. Sodium channel blockers. a. Disopyramide, quinidine, Procainamide. b. Lidocaine, Tocainide, Phenytoin. c. Flecainide, Propafenone. 2. β-Adrenoceptor blockers. 3. Drugs that prolong the effective refractory period: Bretylium, Sotalol. 4. Calcium-Channel blockers: Verapamil, Diltiazem, Bepridil. 5. Broad-spectrum antiarrhythmic drugs: Aminodarone. 6. Others: Adenosine, Digoxin. Some of these drugs will be discussed more elsewhere (β-blockers, calcium channel blockers, digoxin, lidocaine and phenytoin). Discuss the pharmacological actions, adverse effects, precautions and specific clinical indications of antiarrhythmic drugs.
5	Antihyperlipidemics.	1. Classify drugs used in hyperlipidemia (HMG CoA reductase inhibitors-lovastatin, Bile- acid binding resins-cholestyramine and colestipol, Niacin and Gemfibrosil, Ezetimib). 2. Discuss pharmacological actions, adverse effects and special therapeutic indications.

B. PRACTICAL OF LABARATORY SESSIONS

No	Title	Objectives
1	Morphological and surface anatomy of the heart and mediastinum.	1. Outline the divisions of thoracic cavity. 2. Study the parts of mediastinum and their contents. 3. Understand the layers, extension, relations, attachments, and sinuses of pericardium. 4. Describe the normal location and surface marking of the heart, and great vessels. 5. Appreciate important relations of the heart in the middle mediastinum. 6. Study the internal features of heart chambers (atria & ventricles). 7. Study the course and branches of right and left coronary arteries. 8. Identify images of the heart and its blood supply in plain chest X-ray, angiograms and CT scans.
2	Morphological and surface anatomy of blood vessels in the thorax, head and neck, and upper limb regions.	1. Study the main arteries and veins and their branches in the thorax. 2. Study the main arteries and veins and their branches in the head and neck. 3. Study the main arteries and veins and their branches in the upper limb. 4. Study and identify the above arteries in angiograms.
3	Morphological and surface anatomy of blood vessels in the abdomen, pelvis and lower limb regions.	1. Study the main arteries of veins and their branches in the abdomen and pelvis. 2. Study the main arteries of veins and their branches in the lower limb. 3. Study and identify the above arteries in angiograms.
4	Histology of the heart and blood vessels.	1. Examine the detailed microscopic structure of the cardiac muscle. 2. Examine, compare and understand the microscopic structure of walls of different calibre vessels.
5	ECG	1. Demonstration the methods of recording ECG. 2. Recording ECG in the 12 ECG leads. 3. Explain why the same cardiac muscle AP that is recorded in 12 ECG shows different wave deflections. 4. How to interprets the recorded ECG (waves & intervals, NSR). 5. Method of heart rate calculation. 6. The determination of the mean electrical axis of the heart.

		7. Demonstration of the effect of deep inspiration & expiration on heart rhythm (NSA).
6	Measurement of blood pressure and Heart sounds	1. Explain the principle of the indirect methods of BP measurement. 2. Describe the different parts of the mercury sphygmomanometer. 3. Explain the palpation & auscultation methods for BP measurement demonstrating the difference between the two methods. 4. Demonstrating the effect of exercise on systolic, diastolic & pulse pressure with explanation of the mechanism. 5. Demonstrate the locations on chest wall to hear the maximal intensity of heart sounds.
7	Diseases of Blood vessels	1. Describe the gross & microscopic features of atherosclerosis, and describe the gross and microscopic appearances of coronary atherosclerosis and thrombus. 2. Describe the gross & microscopic features of vasculitis including giant cell arteritis, Takayasu disease, Kawasaki disease, Polyarteritis nodosa, and thromboangitis obliterans. 3. Describe the gross & microscopic features of aneurysms. 4. Describe and enumerate the benign tumors of blood vessels including capillary hemangioma, cavernous hemangioma, and glomus tumor. Describe the gross & microscopic appearances of Kaposi's sarcoma and angiosarcoma.
8	Diseases of the heart	1. Describe the gross & microscopic features of acute myocardial infarction and chronic myocardial infarction. 2. Describe the rheumatic heart diseases including valvular lesions and myocardial Aschoff bodies. 3. Describe the gross and microscopic features of intracardiac mural thrombi. 4. Describe the gross and microscopic features of atrial myxoma.
9	Lipid profile	1. Understand how serum cholesterol, triglyceride, LDL & HDL levels can be determined in a clinical laboratory.



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		2. Discuss methods used in the laboratory to quantitative different types of lipoproteins. 3. Know the desirable levels & the risk levels of lipids to avoid heart attack.
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Course information

Course title	Clinical Skills Course 2
Course number	0111500201
Credit hours	1
Course date	:1 st Semester
Course meeting time	According to timetable, usually Monday and Wednesday afternoons 12:30 – 3:30pm
Course location	Clinical Skills Education and Testing Centre Laboratories, Faculty of Medicine
Pre-requested course	Clinical Skills Course 1
Instructor	Dr Katherine Miles Office: 3033 Office hours: Tuesday and Wednesday 9am – 12pm, Phone :0779803235 E-mail :katemiles@doctors.org.uk

Course description:

The aim of this course is to help students to acquire clinical skills through the integrated basic science module which will ultimately help in better patient care.

Through emphasis on communication skills between health care provider and patients and between different medical staff, we are hoping to prepare our students for their future career, also it will help students to integrate their knowledge of basic sciences with clinical practice.

The Clinical Skills Course 2 incorporates history taking and physical examination related to the cardiovascular, respiratory and blood and lymphatic systems.

Consultation Skills:

In these sessions, students learn the elements of effective communication. This involves satisfactory interviews with simulated patients and volunteers, initiating the medical interview and eliciting the medical history appropriately. The exercises include role plays with simulated patients and team members. Students will be given opportunities to view real videos of patient history taking.

- α. Eliciting the medical history in patients with different symptoms related to:
- Respiratory system with special emphasis on social and occupational history and relevant systems review
 - Cardio-vascular system with special reference to exercise tolerance, life style, social history, family history and relevant systems review

- Diseases of blood and lymphatic system with special reference to geography, history of travel, family history and relevant systems review
- β. Learning communication skills to build the relationship with the patient and develop rapport
- χ. Developing specific communication skills to assist in the process of dealing with difficult situations such as an angry or upset patient
- d. Obtaining consent from a patient before performing a basic medical or invasive procedure

Physical Examination Skills:

Conducting appropriate physical examinations focused to elicit physical signs related to:

- Respiratory system
- Cardio-vascular system
- Blood and lymphatic system

Procedural Skills:

Performing appropriate techniques on manikins for

- Endo-tracheal intubation
- Collection of venous blood samples and blood culture
- Basic Life Support and Advanced Life Support
- I/V drug delivery

Learning outcomes:

The course objectives are divided into three categories. These are: Knowledge, Skills, and Attitudes / Behaviors.

Knowledge:

At the end of the CSETC Course 2, the students shall be able to:

- Demonstrate skill in initiating the medical interview and gathering information with good knowledge of the Calgary-Cambridge framework for structuring the medical interview
- Obtain accurate medical histories related to the cardiovascular, respiratory or blood and lymphatic systems
- Interpret their clinical examination findings and laboratory results related to the cardiovascular, respiratory or blood and lymphatic systems based on their basic science knowledge

Skills:

By the end of the CSETC Course 2, in relation to the respiratory, cardiovascular, blood and lymphatic systems, the students shall be able to:

- Collect a focused accurate medical history

- Demonstrate the use of good communication skills when dealing with difficult scenarios such as angry or upset patients/simulated patients
- Perform effective, accurate, comprehensive, focused and appropriate physical examination using simulated patients
- Competently perform endotracheal intubation, blood sampling and intravenous delivery
- Demonstrate a good ability to perform basic and advanced life support with the help of manikins
- Demonstrate the ability to obtain consent from patient before any intervention

Attitudes / Behaviors:

At the end of the CSETC Course 2, the students shall be able to:

- Demonstrate rapport and good skill in building the relationship with the patient/simulated patient
- Demonstrate a professional attitude when dealing with the patient, relatives and health care team
- Demonstrate a good understanding of the sensitive nature of the doctor / patient relationship with attention to the patient's familial, cultural, spiritual circumstances and patient privacy and confidentiality
- Demonstrate a proper professional demeanor by willingly and consistently using appropriate personal safety devices when handling patients, hazardous material or instruments

Instructional methods:

The course is taught through interactive lectures and practical sessions. Instructional methods include:

- discussions
- brainstorming
- group work
- pair work or triplet work
- role play
- simulation
- audio and video feedback
- presentations
- demonstrations

Text book and material:

Author	Title	Published Year
Douglas, Nicol and Robertson Elsevier	Macleod's Clinical Examination	12 th , 2009
Silverman, Kurtz Draper	Skills for Communicating with Patients	2004
Ford, Hennessy, and Japp Elsevier	Introduction to Clinical Examination	8th, 2005
Dacre and Kopelman	Handbook of Clinical Skills	1999

Grading Policy:

Multiple Choice Examination: 40%

Objective Structured Clinical Examination: 40%

Class attendance/participation/evaluation: 20%

Total Points 100

Course Policies:

- **Late Assignments :** Students must give an explanation to the course instructor for any assignment which is submitted late. It will be at the course instructor's discretion if marks will be deducted for late assignments.
- **Missed exams:** If a student misses the multiple choice examination then they will have to take part in the resit examination. Due to timetabling constraints, if a student misses the OSCE then they will not be able to take the OSCE at another time.
- **Absence :** If a student is absent for a practical session then they must discuss this with the course instructor and it is the student's responsibility to attend the practical session at another time. If a student is absent for more than 25% of the sessions then they may be liable to fail the course.
- **Cheating :** Cheating is forbidden in any form. Any students who are caught cheating will be reported to the Medical Dean and further action taken as necessary.

Classroom Protocol:

Students are expected to attend all sessions and to arrive on time for lectures and practical sessions. It is each student's responsibility to know their timetable and which session they should attend on which day. Students are expected to behave respectfully towards all members of staff and each other. Mobile phones are to be switched off during teaching sessions and eating, drinking and smoking are forbidden.

Important Dates to Remember:

Lectures will begin the first week of the semester.

Practical sessions will begin the second week of the semester.

The OSCE is usually timetabled for the last week of teaching in the semester.

The MCQ Examination is timetabled during the examination period.

Student rights and responsibilities:

These are as detailed in the University Regulations

Course Schedule:

Lecture 1 – Review of CSETC Course 1 Skills and Development for CSETC Course 2

Lecture 2 – Consultation Skills and Symptoms for Respiratory System

Lecture 3 – Physical Examination Skills and Signs for Respiratory System

Lecture 4 – Consultation Skills and Symptoms for Cardiovascular System

Lecture 5 – Physical Examination Skills and Signs for Cardiovascular System

Lecture 6 – Data Interpretation Skills for Respiratory System

Lecture 7 – Data Interpretation Skills for Blood and Lymphatic Systems

Consultation Session 1 – Respiratory Medical Interview and Dealing with Crying Patients

Consultation Session 2 – Cardiovascular Medical Interview and Dealing with Angry Patients

Physical Examination Session 1 – Examining the Respiratory System

Physical Examination Session 2 – Examining the Cardiovascular System

Physical Examination Session 2b – Examining the Blood and Lymphatic Systems

Clinical Procedures Session 1 – Advanced Life Support, Cardiac Rhythms, Endotracheal Intubation

Clinical Procedures Session 2 – Venepuncture, blood cultures, IV cannulation, IV drug delivery, removal of cannula

Data Interpretation Session

Course information

Course title	General Microbiology
Course number	0111501204
Credit hours	3
Course date	September 8, 2013
Course meeting time	First Semester, Second Year.
Course location	Allied Medical Sciences Theater
Instructor	Dr. Sameer Ahmad Naji Office Room: 3036 third floor Office hours: Mondays and Tuesdays 11.30-15.30 Phone: 053903333 ext. 5365 E-mail: Sameer@hu.edu.jo

Course description:

This course is an introductory course intended to introduce undergraduate medical students to a variety of subjects in medical microbiology. The course will provide an introduction to the basic principles and application relevance of clinical disease for students who are in preparation for physicians. The content of this rigorous course covers all biology of bacteria, viruses, fungi, parasites, and other pathogens related with infectious diseases in humans.

The course provides the second year medical student with the basic knowledge as well as the practical skills in medical microbiology. In addition to the introduction to the basic biology of micro-organisms of medical importance, interaction of these micro-organisms with humans is studied as related to the pathogenesis and management and control of infectious diseases.

To achieve the maximum benefit of this course and to develop both informatic and diagnostic skills in microbiology including the practical application and interpretation of laboratory tests for the diagnosis of infectious diseases; hard work and appropriate methods of learning are the keys for that target.

Learning outcomes:

Upon completion of this course, the student will be able to:

- Understand the concept of medical microbiology
- Understand the bacterial cell structure, growth, nutrition and genetics
- Understand the biological nature and diversity of microorganisms
- Describe the various methods of sterilization and disinfection
- Understand the various types of antimicrobial chemotherapy
- Recognize the various types of culture media and culture methods
- Differentiate between Gram positive and Gram negative bacteria as well as mycobacteria, rickettsia, chlamydia, mycoplasma and spirochaetes
- Differentiate between the various types of fungi
- Understand the difference between protozoa and helminths

- Understand the viral structure, replication, and genetics
- Understand the pathogenesis and immunity to viral infections
- 12. Describe the various diagnostic methods of viral infections
- 13. Understand the concept anti-viral chemotherapy
- 14. Differentiate between DNA and RNA viruses

Instructional methods:

- Lectures-Power Point presentations
- Departmental hand-outs
- animations, educational movies, illustrations
- Self-readings
- Practical diagnostic classes

Text book and material:

- Jawetz, Melnick, & Adelberg's Medical Microbiology, Latest Edition.
- Bailey & Scott's Diagnostic Microbiology, Latest Edition.
- Sherris Medical Microbiology, An Introduction to Infectious Diseases, Latest Edition.
- Microbiological methods, Collins and Lyne, Latest Edition.
- Medical Microbiology, David Greenwood, Published By ELST with Churchill Livingstone, Latest Edition.
- Kayser, Medical Microbiology, Latest Edition.

Grading Policy:

First Exam: 25%

Second Exam: 25%

Practical Exam: 10%

Final Exam: 40%

Total Points 100

Course Policies:

- **Missed exams:** Students who are absent in any exam are allowed to sit a make-up exam after presenting an approved sick leave or any accepted certificate of absence to the assistant of the faculty dean within 72 hours. The Course Coordinator will determine the time of the exam make-up session. Also, according to the Curriculum Committee and the University regulations, the student will be given a similar examination given to the other students. All examinations must be made up within one week of returning to class. Those absents who do not present a clue will be given a zero mark.

- **Absence:** Professionalism is a major component of our medical curriculum. We believe students should conduct themselves appropriately in the various educational activities of the curriculum. This conduct includes coming to educational activities on-time. The faculty should also demonstrate professionalism, by starting and ending all scheduled educational activities on time and providing a course schedule with clearly explained course policies in the course syllabus. Any changes in the schedule should be given to the students in a timely manner.

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Students are expected to attend all scheduled activities. Students are expected to be on time. Being on time is defined as being ready to start at the assigned time. If a student has an emergency that prevents her/him from attending a scheduled activity, s/he has to notify the Course Coordinator and present an approved sick leave or any accepted certificate of absence by the faculty dean assistant.

Attendance is mandatory. Students are expected to attend all scheduled activities. Students are expected to be on time. Being on time is defined as being ready to start at the assigned time. If a student has an emergency that prevents her/him from attending a scheduled activity, s/he has to notify the Course Coordinator and present an approved sick leave or any accepted certificate of absence by the faculty dean assistant.

Students who exceed the 15% limit without a medical or emergency excuse acceptable to and approved by the Dean of the faculty shall not be allowed to take the final examination and shall receive a mark of zero for the course. If the excuse is approved by the Dean, the student shall be considered to have withdrawn from the course.

- **Cheating:** Cheating will not be tolerated. Each individual student is responsible for his behavior and is expected to maintain standards of academic honesty and professionalism. If any instance of academic dishonesty (cheating, plagiarism, etc.) is discovered by a coordinator or an instructor, it is his or her responsibility to take appropriate action. Such action may include giving a failing grade to the student in the course and/or referring the student for Judicial Procedures Office review and possible disciplinary action, which may include disciplinary suspension or dismissal from the College.

Classroom Protocol:

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Students respond politely to faculty, staff, and student colleagues, exemplifying their maturity and empathy. Students agree to abide by appropriate biosafety practices when required.

All students are expected to be quiet in their seats in the lecture theatre before the start of the lecture. Engagement in class discussions is encouraged without side chatting.

Cell phones are not allowed to be used during lectures and exams unless prior approval has been taken from the course instructor.

Important Dates to Remember:

The Start of the Course-First Trimester

First Exam

Second Exam

Final Exam

Course Schedule :

Topic	No. of Lectures
1. Introduction to Microbiology	1
2. Bacterial Cell Structure	1
3. Nutrition and Growth of Bacteria.	1
4. Control of Microorganisms: Sterilization and Disinfection	2
5. Antimicrobial Drugs	3
6. Bacterial Genetics	1
7. Laboratory Methods, Bacterial Cultures and Culture Media	1
8. Gram-Positive Cocci and Aerobic Gram Positive Bacilli	2
9. Gram-Negative Cocci and Anaerobic Gram-Positive Bacilli	1
10. Haemophilus, Bordetella and Moraxella	1
11. Enterobacteriaceae	2
12. Pseudomonads, Acinetobacter and other Gram-Neg. Bacilli	1
First Exam (24 /10/ 2013)	
11. Vibrios, Campylobacter and Helicobacter	1
12. Brucella and Yersinia	1
13. Mycobacteria	1
14. Rickettsia, Chlamydia and Mycoplasma	1
15. Spirochaetes, Bacteroides and non-sporing Anaerobes	1
16. Fungi	2
17. Introduction to Parasitology	1
18. Protozoa	2
19. Helminths	2
Second Exam (12/12/2013)	
20. Introduction to Virology	1
21. Viral Structure and Replication	2
22. Viral Genetics	1
23. Pathogenesis and Immunity to Viral Infections	2
24. Diagnosis of Viral Infections	1
25. Anti-Viral Agents	1
26. DNA Viruses	2
27. RNA Viruses	1

Final Exam (26/12/2013)

General Microbiology Practical Classes Second Year 2012-2013

Overall Objectives of the Microbiology Laboratory

- ❖ In this portion of the course, student will explore the central roles of microorganisms in nature and in our daily lives. In this process of discovery, he will become adept with standard microbiological techniques that will allow him to investigate the different lab techniques and identify the different types of microorganisms. The various sub-disciplines of Microbiology including, Bacteriology, Parasitology, and Applied Microbiology will be introduced.
- ❖ The objectives over the course of the semester are to:
 - become proficient in laboratory skills and safety protocols.
 - learn to follow experimental procedures.
 - apply the scientific method: formulate answerable questions/hypotheses, predict expected results, make careful observations, collect and analyze/interpret data, and draw appropriate conclusions.
 - To show proficiency in scientific writing (laboratory reports)
 - embark in active learning opportunities in the laboratory.
 - demonstrate good lab student and the ability to work with others.
- ❖ The experiments to be conducted in the General microbiology Laboratory are outlined in a manual, they include:
 - o Laboratory orientation, instruments & equipment.
 - o Laboratory Safety
 - o Cultivation and isolation of bacteria
 - o Culture media and colonial morphology
 - o Gram stain and Ziehl-Neelsen stain
 - o Biochemical tests
 - o Parasitology Lab

Learning Objective

At the end of the lesson, the student should be able to:

- Identify the structure of bacterial cell
- Do simple and differential staining methods
- Describe the essential nutrients required for bacterial growth
- Describe the mechanisms of genetic variation in bacterial cell
- Identify the chemical means of sterilization and disinfection, and their effect on bacterial cell
- Do and interpret the result of anti-microbial sensitivity testing in vitro

Laboratory Safety

- Lab coats and safety glasses must be worn at all times while in the laboratory. Regular prescription glasses are generally not made with safety glass and thus safety glasses must be worn over the top of these glasses at all times. Safety glass checks will be made throughout the semester.
- Only the materials pertinent to lab work, such as a lab manual/notebook, and other lab materials, should be brought to your workspace. All other items such as coats, books, and bags should be stored on the shelves provided for this purpose.
- No eating, drinking or smoking in the lab.
- Know lab safety procedures and the location of the first aid kit, eyewash, and fire extinguisher.
- All culture material should be handled as if it were potentially harmful.
- Be very careful with Bunsen burners. Avoid wearing loose clothing that may be exposed beneath a lab coat and thus provide potential fuel for the flame. Burners should be turned off when not in use.
- Long hair must be tied back at all times while in the laboratory. Long pants and closed toed shoes are suggested.
- The chemical compounds used to stain bacteria can be irritating to the skin. The use of gloves when performing staining procedures will help minimize exposure.
- Dispose of materials as instructed. Do not carelessly throw materials in wastebaskets or sinks; biohazard waste containers are available.
- Report any accident or injury immediately to the laboratory instructor so that prompt action can be taken.
- After each lab, WASH your hands before leaving the laboratory.
- The surfaces of lab benches are washed with disinfectant and rinsed with water twice a day by the teaching assistants and instructor.
- If you have any allergies, chemical sensitivities or if you are pregnant or think you may become pregnant, please identify yourself to the instructor. If, for any of these reasons (or others), you believe that your safety is compromised in the lab, we will make alternative arrangements for completion of this portion of the course.

Course information

Course title	GENERAL PATHOLOGY MODULE
Course number	111501202
Credit hours	3 Credits (2.5 Hours theory & 0.5 hour practical /week)
Course date	16 WEEKS/1st . SEMESTER /YEAR 2
Course meeting time	variable.
Course location	Lecture theater / Allied Medical College
Instructor	Dr. Ikbal Abdul Hameed Al-Kaptan Office location : Office 3032 ,Third floor, Faculty of Medicine. Office hours : 10- 12a.m. in Sunday ,Tuesday & Thursday /week Office Tel .number : 5416 mobile : 0797964467 E-Mail : ikbalalkaptan@ Yahoo.com.

Course description:

Pathology is a branch of Medicine that deals with the scientific study of the causes , pathogenesis (mechanisms) ,structural & functional changes of human organs and tissues in various diseases .

Therefore it is one of the main foundations of medicine_ & it serves to bridge basic medical disciplines with clinical sciences .

Pathology as a whole is divided into two parts :

- A- General Pathology.
- B- Systemic Pathology

General Pathology: Is going to be covered in this course.

It deals with diseases processes in general & there will be a description of the molecular, ultrastructural ,the cellular & the tissue reactions to different injurious agents.

Learning outcome:

By the end of this module, students are expected to know that :

Objectives of the general Pathology course are as follow:

- 1-To understand basic tissue reactions to different types of injuries .
- 2-To know the etiology i.e. causes of major diseases.
- 3-To know the pathogenesis (mechanism) of disease process.
- 4- To describe the morphological features (the gross & microscopic & ultrastructural changes) produced by the disease.
- 5-To describe the effects of the disease on the functions of organs .
- 6-To know the outcome & the possible complications of the disease.

Instructional methods :

Integrated Modular System by:

Lectures - Practicals

- Lectures-Power Point presentations
- Departmental hand-outs
- animations, educational movies, illustrations
- Self-readings

Text book and material:

- Robbins Basic Pathology, 9th. Edition 2013 . By Kumar, et al . Suanders
- Supplementary . Departmental Handouts.
- Rosai & Ackerman's Surgical Pathology .Ninth edition .
- R.C. Curran ,colour atlas of Histopathology .Oxford University...
- Colour Atlas of Gross Pathology .Oxford .

Grading Policy:

Grades can be based on the following:

- First term written exam . = 25 % of total marks.
- Second term written exam. = 25% of total marks .
- Practical online exam. = 10% of total marks.
- Final end course (written) exam. at end of the semester = 40% of total marks.

Total Points 100

Course Policies:

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Important Dates to Remember:

8th.Sept. 2013 Course Start

Dates of First , Second ,Practical & Final examinations are to be informed later.

Course Schedule :

Topics covered in this course includes 22 lectures :

1-Cell injury, cell death & adaptations: From 8th.Sept 2013 to 5th.Oct.2013

(In chapter 1), including introduction to pathology , cellular responses to stress & noxious stimuli; cellular adaptation to stress, causes, morphology, mechanisms and examples of cell injury and necrosis; apoptosis, intracellular accumulations, pathological calcification and cellular aging.

(six lectures)

1st General Pathology Lecture
each type
mention

Discuss & enumerate cellular adaptations and describe Hypertrophy, hyperplasia, atrophy & metaplasia, and their clinical significance .

2nd.General pathology lecture.
Cell injury.

Enumerate the types of injurious agents that cause cell injury .And mention their exact role in cell injury
Define reversible & irreversible cell injury, mention their gross, microscopic & ultrastructural features, as well as their clinical significance .
Define hydropic degeneration & Fatty changes , and describe their gross & microscopic features

3rd General pathology lectures
Irreversible cell injury
Necrosis & apoptosis

Define necrosis & apoptosis .
Mention & differentiate between each type regarding their gross, microscopic & ultrastructural features
Describe the nuclear changes in necrosis
Discuss the causes, pathogenesis, and features of apoptosis.

Discuss the subcellular injury of mitochondria , cytoplasmic organelles, cell membrane & DNA.

4th. General pathology lecture
coagulative , Patterns of necrosis
gangrenous .

Enumerate the patterns of necrosis , including liquifactive, fibrinoid, fat necrosis, caseating &

Discuss each type and mention their causes and their clinical Significances.

5th & 6th. General pathology
Lectures.

Discuss & describe intracellular accumulations, &aging.

2- Acute and chronic inflammation .Healing & Tissue repair: From 6th Oct.2013- 8th.Nov.2013.
(In chapters 2&3) . 6 Lectures .

- | | |
|--|---|
| 1 st . Lecture(Inflammation)
chronic & | <p>-Define inflammation, mention the causes, the types acute , subacute .The cardinal signs & nomenclature .</p> <p>Discuss the vascular & cellular responses in acute inflammation</p> <p>Discuss the causes of increased vascular permeability.</p> <p>Discuss the mode of leukocytic cell margination , sticking & rolling, immigration ,chemotaxis & phagocytosis.</p> <p>Describe the gross & microscopic features of acute inflammation</p> |
| 2 nd .Lecture (Inflammation) | <p>- Mention the role of chemical mediators in inflammation</p> <p>Enumerate the types of chemical mediator , their source & mode of action.</p> <p>Enumerate the patterns of inflammation, & describe each type , mention their gross & microscopic features & clinical significance .</p> |
| 3 rd . Lecture (Inflammation) | <p>Define abscess, ulcer, pus ,exudates & transudate .</p> <p>- Discuss the outcome of acute inflammation .</p> <p>Enumerate inflammatory cells both in acute & chronic inflammation, describe each cell, & mention their role in inflammatory processes.</p> |
| 4 th . Lecture (Inflammation) | <p>-Define chronic inflammation , discuss its forms , pathogenesis & outcome .</p> <p>Define granulomatous inflammation.</p> <p>Enumerate the causes of granulomatous reactions</p> <p>Describe the microscopic features of granulomas.</p> |
| 5 th . Lecture (Inflammation) | <p>- Discuss the local effects of inflammation, both beneficial & harmful effects.</p> <p>Discuss the systemic effects of inflammation & it's pathogenesis.</p> |
| 6 th .Lecture (Healing & repair) | <p>Define tissue healing & repair.</p> <p>Discuss the types of somatic cells ,and stem cells.</p> <p>Discuss the role of growth factors in healing process.</p> <p>Discuss the role of extracellular matrix in healing process.</p> |

Describe the primary union & secondary union in healing of skin wounds.

Enumerate causes of delay of healing process

Define keloid, proud flesh scar.

3- Hemodynamic Disorders: (Chapter 4)From 10th. Nov. 2013 to 8th Dec.2013.

(In four lectures) .

1st. Lecture

Define edema, enumerate the causes, and discuss it's pathophysiology

Edema, congestion
edema .
& hyperemia

Describe the morphological features of localized & generalized

Define hyperemia , discuss it's causes & it's clinical significance .
Define congestion, discuss the causes , pathophysiology & it's gross & microscopic features.

Describe liver congestion (nut-meg liver), & pulmonary congestion

2nd. Lecture

Hemorrhage
& Hematomas

Discuss hemorrhage , external & internal hemorrhages,
mention the nomenclatures of external bleeding like epistaxis,
hematuria ...etc. What is a hematoma ? describe the gross & microscopic features .

3rd. Lecture

Hemostasis
discuss & Thrombosis

Define thrombosis. Enumerate it's causes. What is Virchow's triad?

Describe endocardial , arterial , venous & postmortem thrombi,
their causes , gross & microscopic features & clinical significance .

Discuss the fate of thrombus .

Discuss causes , pathophysiology, gross & microscopic features & the clinical significance of DIC .

4th. Lecture

Embolism & Infarction .

Define embolism .Enumerate it's types: thromboembolism, fat,
air , amniotic fluid , bone marrow & air embolism.

Discuss the pathogenesis , it's gross, microscopic & clinical features .

Define infarction .Describe the gross & histological features.

Causes of white & red infarctions .

Discuss the factors that influence the formation of an infarct .

4- Neoplasia : (Chapter 6) From 10th. Dec. 2013 to 10th. Jan.2014 .
(6 lectures).

1st. & 2nd Lectures

Define neoplasm, discuss, benign & malignant tumors ,
nomenclature of tumors
Discuss the differences between benign & malignant cells ,
regarding microscopic features & biological behavior.
Define hamartoma , teratoma , mixed tumors
Dysplasia ,mild, moderate & sever dysplasias carcinoma in situ .

3rd Lectures
Biological features
of neoplasia

Discuss the biological features of malignant tumors , the cell
morphology , anaplasia , modes of spread & metastases,
Discuss the epidemiology of cancer. Causes of cancer , chemical
carcinogens ,& biological carcinogens .Occupational & hereditary
cancers. Preneoplastic lesions .

4th.& 5th. Lectures
Carcinogenesis

Discuss carcinogenesis , define oncogene , discuss the multistep
theory of neoplasia , the pathogenesis of carcinogenesis .The
chromosomal changes in cancer.

6th . Lecture
Paraneoplastic syndrome
, grading , staging of cancer .
lab. Diagnosis

Discuss the effects of cancer on host
Define the paraneoplastic syndromes & ectopic hormones
Define the grading of cancer.
Define staging of cancer & mention the TNM,AJM, staging systems
used.

Practical Classes :

The objective is to be familiar with morphological patterns of diseases through looking at
slides & photographs of ultrastructural , histopathological sections & gross specimens
those with various diseases .

Four practical sessions were held in this module:

First practical pathology Lab.

Cell injury :

The students are informed about tissue processing & a visit
to the pathology lab. to have an idea about used instruments
& be informed about how histological sections & cytology
specimens were prepared .
A review of gross morphology ,& histological sections of
reversible& irreversible cell injuries were done including
hydropic degeneration types of necrosis & intracellular
accumulations .

Second practical pathology
Lab.Inflammation

The students were informed to identify the gross & microscopic features of acute & chronic inflammation, to identify the types of inflammatory cells
The patterns of inflammation .
To identify abscess, ulcer & granulomas.
The gross & microscopic features of healing & repair are reviewed , including granulation tissue & fibrous scars & keloid.

Third Practical pathology Lab.
Hemodynamic Disorders :

The students are informed to identify the gross & microscopic appearances of edema , congestion , hemorrhages , hematomas thrombosis , embolism & infarction .

Forth practical pathology Lab.
Neoplasia :

Differentiate between benign & malignant tumors. Describe a benign & a malignant tumor . Discuss grading & staging of cancer.

Summary of the Teaching Activities in the Module :

Subject	Number of Lectures	Practical Labs.
Cell Injury	6	1
Inflammation	6	1
Hemodynamic disorders	4	1
Neoplasia	6	1
Total	22	4

Updated at 2nd Sept.2013



الجامعة الهاشمية
The Hashemite University

Course information

Course title	General Pharmacology
Course number	0111501203
Credit hours	3
Course date	September 7, 2012
Course meeting time	On Mondays & Tuesdays: Sun 8:0 – 11:0 am
Course location	Faculty of Medicine Theater
Instructor	Prof. Qassem Al Saudi Dr. Khalil Abboud Makki Office Room 3018 third floor Office hours: Sundays 11.0-1.30 Phone: 053903333 E-mail: kassim44@yahoo.co.uk / kamakki@gmail.com

Course description:

This course should cover the following subjects, Pharmacokinetics, Pharmacodynamics, dose response relationship, drug toxicities and side effects, drug cost-benefit relationship, principles of drug trials, principles of drug prescription, principles of drug utilization, drug information facilities and drug interaction, drug epidemiology, principals of antimicrobial drugs, principals of anticancer drugs, immunosuppressants.

Learning outcomes:

Upon completion of this course, the student will be able to:

- Understand the principles of pharmacology that enable the student to use the drug properly and safely in his practice of medicine.
- Understand the therapeutic indications, contraindications, toxic effects and drug-interaction of commonly used drugs in clinical practice.
- Able to study drugs that are used in emergency cases such as status epilepticus and asthmaticus.

Instructional methods:

- Lectures-Power Point presentations
- Departmental hand-outs
- animations, educational movies, illustrations
- Self-readings
- Practical diagnostic classes

Text book and material:

- Lippincott's Illustrated Reviews: Pharmacology, Richard A. Harvey, Pamela C. Champe, 5th Edition 2012, Lippincott Williams & Wilkins.
- Goodman and Gilman's: The Pharmacological basis of therapeutics, 11th edition, 2006, McGraw-Hill.
- Pharmacology, H.P. Rang, M.M. Dale and Ritter, 6th edition, 2007, Churchill Livingstone.
- Elsevier's Integrated Pharmacology, M. Kester, K.E. Vrana, S.A. Quraishi and K.D. Karpa, 1st edition, 2008, MOSBY.

Grading Policy:

First Exam: 30%

Second Exam: 30%

Final Exam: 40%

Total Points 100

Course Policies:

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Important Dates to Remember:

7 Sep 2013 Course Start
27 Oct 2013 First Exam
1 Dec 2013 Second Exam
22 Dec 2013 Final Exam

Course Schedule :

Week No.	Date	Lecture	Instructor
1 st Week	Sunday 8/9/2013	General Pharmacology	Dr. Khaleel
2 nd Week	Sunday 15/9/2013	General Pharmacology	Dr. Khaleel
3 rd Week	Sunday 22/9/2013	Re-Scheduled	
4 th Week	Sunday 29/10/2013	General Pharmacology	Dr. Khaleel
5 th Week	Sunday 6/10/2013	ANS	Prof. Kassim
6 th Week	Sunday 13/10/2013	Eid Al Adha Holiday	
7 th Week	Sunday 20/10/2013	Pharmacology of CVS	Prof. Kassim
8 th Week	Sunday 27/10/2013	First Exam	
9 th Week	Sunday 3/11/2013	Antimicrobial Agents	Prof. Kassim
10 th Week	Sunday 10/11/2013	AB	Prof. Kassim
11 th Week	Sunday 17/11/2013	AB	Prof. Kassim
12 th Week	Sunday 24/11/2013	Antifungal + Antiviral + Blood	Dr. Khaleel
13 th Week	Sunday 1/12/2013	Second Exam	
14 th Week	Sunday 8/12/2013	NSAIDs	Dr. Khaleel
15 th Week	Sunday 15/12/2013	Pharmacology of CNS	Dr. Khaleel
16 th Week	Sunday 22/12/2013	Final Exam	

Course information

Course title	HEMATOPOIETIC & LYMPHOID TISSUE DISORDERS.
Course number	111501207
Credit hours	5 Credits
Course date	5 weeks /second semester /2 nd year Medical students
Course meeting time	variable
Course location	Lecture theatre / College of Allied Medical college .
Instructor	Dr.Ikbal Abdul Hammeed Al-Kaptan Office location: 3032 / Third floor /Faculty of Medicine Office hours : From 10-12 a.m on Sunday , Tuesday & Thursday /week Phone 4516. mobile :0797964467 E-mail : ikbalalkaptan @ Yahoo.com.

Course description:

Hematopoietic & Lymphoid tissue disorders module is an intensive multidisciplinary 5 credit hours course designed to provide students the basic sciences and clinical framework for topics in blood disorders including peripheral blood & bone marrow together with study of the lymphoid tissues including spleen , lymph nodes & thymus .. The course is designed to assist the student in integrating the different disciplines' lectures and practicals in each system including anatomy, physiology, pathology, microbiology, pharmacology, biochemistry, and community Medicine .

Learning outcome:

GENERAL INTENDED OBJECTIVES

By the end of this module, students are expected to:

- 1- Describe the constituents of peripheral blood, their origin & function .
- 2- Describe the structure, morphology and function of normal bone marrow . . .
- 3- Describe the development of hematopoietic & lymphoid tissue.
- 4- Describe the important aspects of hemoglobin genetics& abnormal hemoglobin synthesis.
- 5- Understand the basic classification systems of anemia, their laboratory & clinical features, public health aspects& their managements.
- 6-Describe the normal lymph node appearance both gross & microscopic exam..
- 7-Describe the normal spleen both grossly & microscopically .
- 8-Describe the regulatory mechanisms of normal hemostasis , abnormalities that lead to bleeding disorders ,pathologic aspects that cause thrombotic disorders & how are these conditions treated .
- 9- Identify the various thrombocytes disorders as thrombocytopenia .
- 10 - Identify the various white blood cells disorders as leukocytosis & leucopenia.
- 11- Identify & classify the various types of leukemias ., and differentiate between the different types.
- 12- Describe the various lymphoid diseases ,whether reactive , inflammatory or neoplastic .
- 13- Discuss the morphology of various types of lymphomas , their grading & staging

14- Describe the microorganisms that infect the hematopoietic & lymphoid systems

15- Understand causes of toxemia, its diagnosis, treatment & prevention.

16 -Regarding drug therapy, to identify prototype drugs used in prevention & treatment of hematopoietic & lymphoid system diseases: to describe the pharmacological actions of these drugs on various organs, to identify the adverse effects, precautions & contraindications related to their use, & to appreciate the importance of individualization of drug therapy.

Instructional methods:

- Integrated Modular System by:
- Lectures-Power Point presentations
- Departmental hand-outs
- animations, educational movies, illustrations
- Self-readings

Text book and materia

* Anatomy :

- Principles of Human Anatomy. By G.J.Tortora, 8th. Edition 1999 or latest edition.
- Clinical Anatomy for Medical Students, By R.S. Snell, 4th. Edition or latest edition.
- Grant's Atlas of Anatomy or any other reasonable colored Atlas of Human Anatomy.
- Basic Histology. By L. Junqueira, 8th. Edition 1995 or latest.
- Before we are born. By K.L.Morre and T.V.N. Persaud, 5th. Edition 1998 or latest edition.

* Physiology :

- Textbook of Medical Physiology. By Gyton and Hall, 9th. Edition or latest edition.

* Biochemistry :

- Harper's Biochemistry. By Robert K. Murray and Co., 1999 or latest edition.

* Pharmacology :

- Lippincott's Illustrated Reviews : Pharmacology, 2nd. Edition 2000 or latest edition.

* Pathology :

- Robbin's Basic Pathology, By Kumar, Cotran and Robbin's, 9th. Edition 2013.
- Supplementary . Departmental Handouts.
- Rosai & Ackerman's Surgical Pathology .Ninth edition .
- R.C. Curran ,colour atlas of Histopathology .Oxford University.
- Colour Atlas of Gross Pathology .Oxford .

*Microbiology :

- Medical microbiology .An introduction to infectious diseases. By Sheries.Latest edition.

Grading Policy:

- Written exam, at the end of the system = 40% of total marks
- Practical exam. At the end of the system = 20% of total marks
- Final end course exam at end of the semester (written)= 40% of total marks

Total Points 100

- **Missed exams:** Students who are absent in any exam are allowed to sit a make-up exam after presenting an approved sick leave or any accepted certificate of absence to the assistant of the faculty dean within 72 hours. The Course Coordinator will determine the time of the exam make-up session. Also, according to the Curriculum Committee and the University regulations, the student will be given a similar examination given to the other students. All examinations must be made up within one week of returning to class. Those absents who do not present a clue will be given a zero mark.
- **Absence:** Professionalism is a major component of our medical curriculum. We believe students should conduct themselves appropriately in the various educational activities of the curriculum. This conduct includes coming to educational activities on-time. The faculty should also demonstrate professionalism, by starting and ending all scheduled educational activities on time and providing a course schedule with clearly explained course policies in the course syllabus. Any changes in the schedule should be given to the students in a timely manner.

Students will be accountable and personally responsible for attending all educational activities (lectures, labs, examinations, etc.). Unexcused absences reflect negatively on the goals and objectives of the medical curriculum and demonstrate unprofessional behavior by the respective student.

Students are expected to attend all scheduled activities. Students are expected to be on time. Being on time is defined as being ready to start at the assigned time. If a student has an emergency that prevents her/him from attending a scheduled activity, s/he has to notify the Course Coordinator and present an approved sick leave or any accepted certificate of absence by the faculty dean assistant.

Attendance is mandatory. Students are expected to attend all scheduled activities. Students are expected to be on time. Being on time is defined as being ready to start at the assigned time. If a student has an emergency that prevents her/him from attending a scheduled activity, s/he has to notify the Course Coordinator and present an approved sick leave or any accepted certificate of absence by the faculty dean assistant.

Students who exceed the 15% limit without a medical or emergency excuse acceptable to and approved by the Dean of the faculty shall not be allowed to take the final examination and shall receive a mark of zero for the course. If the excuse is not approved by the Dean, the student shall be considered to have withdrawn from the course.

- **Cheating:** Cheating will not be tolerated. Each individual student is responsible for his behavior and is expected to maintain standards of academic honesty and professionalism. If any instance of academic dishonesty (cheating, plagiarism, etc.) is discovered by a coordinator or an instructor, it is his or her responsibility to take appropriate action. Such action may include giving a failing grade to the student in the course and/or referring the student for Judicial Procedures Office review and possible disciplinary action, which may include disciplinary suspension or dismissal from the College.

Classroom Protocol:

Professionalism is a major component of our medical curriculum. We believe students should conduct themselves appropriately in the various educational activities of the curriculum. This conduct includes coming to educational activities on-time. The faculty should also demonstrate professionalism, by starting and ending all scheduled educational activities on time and providing a course schedule with clearly explained course policies in the course syllabus. Any changes in the schedule should be given to the students in a timely manner.

Students respond politely to faculty, staff, and student colleagues, exemplifying their maturity and empathy. Students agree to abide by appropriate biosafety practices when required.

All students are expected to be quiet in their seats in the lecture theatre before the start of the lecture. Engagement in class discussions is encouraged without side chatting.

Cell phones are not allowed to be used during lectures and exams unless prior approval has been taken from the course instructor

Important Dates to Remember:

8th.April 2014 : course starts .

* The exact dates of the examinations will be announced later.

Course Schedule :

Anatomy : 5 Lectures + 1 Practical	
Dr, Saad Al-Sabti (PHD)	
Lecture Title	Lecture Objectives
Lectures 1,2 &3	1- Describe the blood tissue .
Anatomy & Histology lectures	2- List the composition of blood .
Blood	3- Describe the blood plasma.
	4- Classify formed elements of blood .
	5- Name the organs responsible for hematopoiesis in the fetus
	6- List the developmental stages of hematopoiesis both prenatally & postnatally .
	7- Discuss the structure & function of red blood cells (RBCs)
	8- Describe Erythropoiesis.
	9- Discuss the structure & functions of granular & agranular leucocytes .
	10- Describe platelets (thrombocytes)
	11- Discuss the process of formation of platelets.

4th. & 5th, lectures:	
Anatomy & Histology lectures	1- Describe the lymphatic system.
Lymphatic system	2- List the composition of the lymphatic system.
	3- Review the importance of the lymphatic system.
	4-Describe the origin & composition of lymph.
	5- Describe lymphatic vessels & differentiate between blood capillaries& lymphatics.
	6- Describe lymph trunks and lymph ducts.
	7- Describe the thoracic duct & the right lymphatic duct.
	8- Describe the formation & flow of lymphatics.
	9- Describe the lymphatic organs & tissues .
	10- Describe the primary lymph organs, Thymus & red bone marrow .
	11- Describe the secondary lymphatic organs: Lymph node,
	12- Lymph nodes,spleen, tonsils & Lymphatic nodules.
Physiology : 6 lectures. 2 Practical sessions	
Dr. Faiq Husain (PHD)	
First physiology lecture :	
Blood , composition & function	1- Describe the fluid portion of blood, in which blood cellular elements are suspended.
	2- Explain what properties that made the blood to act as a transporting media
	3- Describe the constituents of the plasma and how it attributes to the general function of the plasma
	4- What are the cellular elements of the blood ?
Second & third physiology lectures.	
	1- State that RBCs are non-nucleated biconcave discs elastic, R.B.Cs: characteristics & functions their number in peripheral blood
	2- Sites of formation , discuss the normal percentage of reticulocytes of the whole circulating red blood cells , Explain what it does mean the increase in this percentage ?

	3- Describe the main constituents of RBCs & how they contribute to the RBCs function.
	4- How RBCs are regulated , the effect of hypoxia .
	5- Describe the role of iron, vitamin B12 & folic acid deficiency .
	6-Describe the clinical consequence of iron, vitamin B12 & folic acid deficiency.
	7- Discuss the laboratory classification of anemia. The absolute values.
4th, physiology lecture	
WBCs characteristics & functions .	1- How to recognize different WBCs types & describe their site of production, life span & function .
	2- Describe the properties of phagocytic WBCs and physiological leukocytosis .
	3- Describe the tissue macrophages & the reticulo-endothelial system
5th. Physiology lecture:	
Physiology of homeostatic homeostasis .	1- Define homeostasis & describe the steps involved in
& blood coagulation	2- Discuss the role of blood platelets in homeostasis.
	3- Describe the key reaction in blood coagulation , the intrinsic & extrinsic pathways in blood coagulation .
	4- Describe the mechanism of anticoagulants .
	5- Describe conditions that lead to excessive bleeding & blood coagulation test.
6th, physiology lectures	
groups ?	1- On what basis human blood is typed into different blood
Blood group	2- Describe the ABO & Rh systems of blood grouping.
	3- Explain why in blood transfusion , more importance is given to the recipient antibodies & the donor RBCs?
	4- Describe the importance of cross-matching tests.
	5- How the ABO group considers as " universal recipient"& group O as "universal donor ".
	6- Describe the antibodies to D- antigen do normally present in plasma, under what condition they are developed?

Pathology : 12 Lectures ,2 Practicals	
Dr, Ikbal Al-Kaptan(FRCPath)	
1st . Pathology lecture	
RBCs disorders.Post hemorrhagic cells & Hemolytic Anemias	* Describe the normal Adult reference ranges for red blood & their indices.
	* Classify Anemias according to their (I) tiology morphology . (II)RBCS
	* Describe the main pathological , clinical manifestations &
	*Describe anemia of chronic blood loss.
	* Describe the sequences & effects of intravascular & extravascular RBC destruction i.e hemolysis ,
	* Describe the definition, pathogenesis , characteristic clinical features . Blood film finding, diagnostic & complications of Hereditary spherocytosis .
2nd . Pathology Lecture	
Sickle cell disease , Thalassemia, G6PD deficiency Clinical diagnosis &features complications .	* Describe Sickle cell anemia , itiology, pathogenesis , The variables that influence sickling. Sickling consequences Blood film & bone marrow morphology
	* Define Thalassemia , classify it into alfa & beta types
	* Discuss the etiology, pathogenesis & diagnosis of alfa Thalassemia .
	* Discuss the itiology , pathogenesis , peripheral blood & bone marrow morphology in beta thalassemia . It's clinical manifestations & complications.
	* Describe the causes ,etiology , pathogenesis , type of inheritance , blood film finding & diagnosis of G6PD deficiency .
3rd. Pathology Lecture	
Iron Deficiency, Megaloblastic & Aplastic anemias.	Describe the nomal iron balance ,Discuss the itiology,effects, BF&BM morphology ,clinical features & diagnostic criteria for iron deficiency anemia .
	*Describe the causes ,pathogenesis , BF , BM morphology , clinical manifestations , diagnostic criteria & complications of Megaloblastic anemia

	* Describe the etiology, pathogenesis, BF, BM, features, clinical manifestations, diagnostic criteria, complications & prognosis of Aplastic anemia.
4th. Pathology Lecture	* Define polycythemia, mention the types, primary & secondary Polycythemia Etiology, and pathogenesis, PB&BM morphology & clinical features
5th. Pathology Lecture	
Non-neoplastic disorders of WBCs	* Describe the etiology, pathogenesis, BM changes, clinical course & complications of neutropenia / agranulocytosis.
	* Enumerate the causes of leukocytosis
	* Describe the epidemiology, immunology, morphological features & clinical manifestation, diagnostic criteria & complications of Infectious mononucleosis.
	* Describe the etiology, gross & microscopic patterns of acute & chronic non-specific lymphadenitis.
6th. & 7th. Pathology lecture	
Neoplastic proliferation of WBCs.	* Define leukemia and describe the FAB classification of leukemia, Leukemias Lymphomas discuss the common features of each type including the pathophysiology, signs & symptom.
	* For lymphoid neoplasms Define: (1) the origin (B & T – cells) (2) monoclonality (3) disruption of the normal immune regulatory mechanisms
8th. Pathology Lecture	
Multiple myeloma & related plasma cell disorders.	* Define Multiple myeloma & related plasma cell dyscrasias.
	* Describe the common features, pathophysiology, morphologic features. Clinical manifestation
9th. Pathology lecture.	
Hodgkin's lymphoma.	* Classify Hodgkin's lymphoma, describe the etiology, pathogenesis characteristic morphologic features, clinical staging of HL&NHL (Ann Arbor classification). Course, diagnosis & prognosis of each of the four types.
10th&11th. Pathology lectures	
Platelets disorders & Bleeding disorders	* Describe the normal homeostatic response & common laboratory tests in patients with bleeding disorders.
	* Enumerate the causes of bleeding disorders.
	* Describe the etiology, pathogenesis, complications & prognosis of (DIC)

	* Define Thrombocytopenia , discuss the etiology, BM & spleen morphology , diagnosis & prognosis of Immune(idiopathic) thrombocytopenic purpura(ITP)
	Thrombotic thrombocytopenic purpura (TTP) .
12th.Pathology lecture	
Coagulation disorder, Splenomegally	* Review the structure & function of plasma factor VIII-VWF co complex.
	* Describe the etiology, clinical features & diagnosis of :
	(1) Von-Willbrand disease.
	(2) Factor VIII deficiency (HemophiliaA)
	(3)Factor IX deficiency (Christmas disease or HemophiliaB)
	* Enumerate causes of splenomegaly & their effect
Biochemistry : 4 lectures .1 Practical.	
Dr. Moayed Mehdi Abood (PHD)	
1st. Biochemistry Lecture	
Erythrocytes Metabolism.	
	1. Understand the hexose monophosphate pathway.
	2. Understand the specificity of glucose utilization for energy production ;anaerobic glycolysis
	3. List the biochemical abnormalities associated with hemolytic anemia
2nd. Biochemistry lecture :	
Molecular biology of globin chain synthesis.	1-Understand the organization of globin genes including β gene families .
	2- Explain the synthesis of globin chain.
	3- Explain the role of iron in Hb synthesis .
	4- List the types of hemoglobin present in normal blood and what is the percentage of each type ?
3rd. Biochemistry Lecture Hemoglobinopathies	1 -Identify the structural abnormalities of sickle cell anemia (HbS) , HbC disease (HbC) and HbSC disease (HbSC) .
	2- Understand the principle behind hemoglobin electrophoresis as a diagnostic tool for hemoglobinopathies .
	3- Describe the basic genetic defect for sickle cell disease and thalassemia .
	4- Enzyme defects in porphyrias .

4th. Biochemistry Lecture	
Biochemistry of coagulation .	1-Factors involved in blood coagulation .
	2- Types of coagulation pathways .
Microbiology :5 Lectures .	
Dr. Mohammed Al-Timimy (PHD)	
1st. Microbiology Lecture	
For each organism :	
Salmonella Typhi,	
enteric fever & Brucella .	1- Describe the morphology & the structure.
	2- Describe growth & toxins .
	3- Explain pathogenesis & clinical disease .
	4- Explain mode of transmission .
	5- Explain the clinical manifestations.
	6- Be familiar with laboratory diagnosis .
	7- Be familiar with treatment and prevention .
2nd Microbiology Lecture	
Plasmodium and Babesiosis	Describe the following :
	1-Microscopical properties, classification & diseases.
	2- Microscopic differences between species , life cycle, epidemiology & pathophysiology.
	3- clinical presentation, specimen collection, diagnosis , treatment & prevention .
3rd. Microbiology Lecture	
Yersinia pestis & Plaque:	For Yersinia pestis & Plaque :
Q- fever & other differences	1- Describe the general microbiological properties , from other Yersinia .
	2- Cultural techniques, epidemiology & patho-physiology.
	3- Clinical presentation, specimen collection for cultura, treatment & prevention .
	For Q- fever & other Rickettsia, describe the following :
	1-Microbial properties & diseases.
	2- Multiplication strategies, epidemiology & pathophysiology.
	3- Clinical presentation, specimen collection, laboratory diagnosis, treatment & prevention .

4th. Microbiology Lecture	
Trypanosomiasis, visceral leishmaniasis and filariasis .	For each of Trypanosomiasis, Leishmaniasis & filariasis, describe the following : 1- Microbiological properties. 2- Classification & diseases. 3- Microscopical differences between species . 4- Life cycle , epidemiology & specimen collection . 5- Pathophysiology & clinical presentation . 6- Diagnosis, treatment & prevention .
5th. Microbiology Lecture	1- Describe microbiological properties & diseases.
Epstein- Barr Virus (EBV) and Parvovirus	2-Multiplication strategies , epidemiology & pathophysiology. 3- Clinical presentation , specimen collection , laboratory diagnosis, treatment & prevention .
Pharmacology : 8 Lectures	
1st.& 2nd . Pharmacology lectures	The pharmacology & uses of iron preparations, folic acid & vitamin B12.
4th. & 5th. Pharmacology lectures molecular Anticoagulant & Thrombolytic agents .	Discuss the pharmacology of anticoagulants (heparin, low weight heparins& Warfarin). Discuss the pharmacology of thrombolytic agents (streptokinase,altepase) & antiplatelets drugs(Aspirin and ticlopidine). List adverse effects, contraindications, drug interactions of the above drugs. Realise their special indications in thromboembolism & ischemic heart disease.
6th. & 7th. Pharmacology lectures:	
Drugs for treatment of lymphomas & leukemias.	
	Discuss pharmacology, therapeutic uses & adverse effects.
8th. Pharmacology Lecture: Immunopharmacology	

Community Medicine Lectures:

Dr. Eman Al-Kamel (Ph D)

1st. Lecture

Blood born infection:

Objectives: At the end of the course, the student should be able to:

- Classify blood born infection according to microorganism.
- Know the risk of blood born infection
- Detection and diagnosis of blood born infection
- Discuss method of management of blood born infection
- Discuss method of prevention of blood born infection

2nd Lecture :

Anemia: a public health problem

Objectives: At the end of the course , the student should be able to:

- Describe the worldwide prevalence of anemia.
- Define anemia
- Know Hemoglobin threshold
- List Factors responsible for high prevalence of anemia
- Classify anemia as a problem of public health significance
- Know the health consequences of anemia.
- Assessing anemia
- Know the control of anemia
- Correcting anemia
- Know maternal consequences of anemia

Practical Laboratory Sessions

Anatomy Lab.

1- Histology of blood smear.

1- Review criteria for identifying neutrophils.

2- Histology of lymphoid tissue

2-Examine the blood smear under the light microscope applying the above criteria to identify neutrophils .

3- Repeat the same process above in identifying red blood cells , basophils , acidophils, lymphocytes & platelets.

	4- Review criteria and distinguish histological features for identifying a lymph node.
	5- Examine a cross section of a lymph node under the light microscope.
	6- Repeat the same process above in identifying a cross section of a spleen, thymus & tonsils .
1st. Physiology Lab. RBCs & WBCs count	1-Demonstration the methods of counting RBCs & WBCs using the counting chambers .
PCV & Blood grouping	2- Demonstration the PCV test using the microhematocrite.
	3- Students are asked to find their own blood group & the percentage of each blood group of the students attending the practical session .
2nd. Physiology Lab. WBCs & differential count	1- Preparing & staining a blood film by the students.
	2- Examination of the slide to be familiar with the identification of WBC types.
	3- Count the percent of each type of WBC.
Biochemistry Lab.	I suggest to present slides on cases of hemoglobinopathies and describing the principle diagnostic tests of these diseases instead of the present lab subject.
1st. Pathology Lab.	
Identify the morphologic abnormalities of peripheral blood Anemias & Leukemias & bone marrow in :	
	1- Iron deficiency anemia .
	2- Megaloblastic anemia .
	3- Thalassemia .
	4-Sickle cell anemia.
	5-Microangiopathic hemolytic anemia .
	6-G6PD hemolytic anemia .
	7- Hereditary spherocytosis .
	8- Identify lymphoblasts , myeloblasts , promyelocytes & Auer rods.
	Identify the diagnostic microscopic changes of :
	1- Acute myeloid leukemia .
	2- Acute lymphoblastic leukemia .

	3- Chronic myelogenous leukemia .
	4- Chronic lymphocytic leukemia .
	5- Hairy cell leukemia .
2nd. Pathology Lab.	
Lymphadenitis & Lymphomas	Identify the microscopic features of :
	1- Follicular hyperplasia .
	2- Lymphadenitis ,TB & Cat scratch disease .
	3- Follicular lymphoma .
	4- Mantle cell lymphoma .
	5- Small lymphocytic lymphoma .
	6- Large cell lymphoma
	7- Hodgkin's lymphoma .
Microbiology Lab.	
Blood culture techniques	1- Describe aseptic techniques used in blood culture .
culture	2- Describe types of systems involved in the blood (automated & manual).
	3- Describe different types and constituents of blood culture bottles .
	4- Describe cultural and incubational environments .

Summary of the Teaching Activities in the Module :

Department	No. of lectures	No. of Labs .
Anatomy	5	1
Physiology	6	2
Biochemistry	4	1
Pathology	12	2
Microbiology	5	1
Pharmacology	8	0
Community Medicine	2	0
Total	42	7

Course information:

Course name	Introduction to community medicine
Course code	0111501209
Course date	June –August
Credit hours	3hours/ theory
Course meeting time	Variable
Course location	Faculty of Medicine
Instructor	Dr Eman A. Al- Kamil Office: 3034 phone:5568 Office Hours : Sunday 12-2 /Tuesday 12-1/Thursday 12-1 e-mail: emanadnan@ hu.edu.jo

Description:

This course is an introductory course intended to introduce undergraduate students in a variety of disciplines to the basic items of public health. The subject will enable the students to acquire skills and develop an attitude towards the community as the focus of care utilizing the Primary Health Care approach, and accept his responsibility for health promotion and disease prevention as part of the holistic approach to health care. The course will provide an introduction to community medicine , epidemiology, primary health care, mother and child health (MCH) and health care system.

Learning outcomes:

After the completion of the course the student will be able to:

- 1-Understand the concept and meaning of community medicine
- 2-Identify the aims and objectives of community medicine
- 3-Describe the community medicine development
- 4-Identify the components of community medicine
- 5-Identify the rule of community doctor
- 6 –Understand the measures of population health, fertility rates, mortality rates and morbidity rates.
- 7-Recognize the various types of health service
- 8-Describe the principles of primary health care.
- 9-identify the component of primary health care
- 10-identify the different services available in the MCH center for children under five.
- 11-discuss the importance of maternal services, antenatal, natal and postnatal care.
- 12-identify the main maternal health problems
- 13-identify high risk pregnancy
- 14-discuss the important of vaccination
- 15-identify the schedule of EPI
- 16-identify the different contraindication to vaccinations
- 17- Discuss the importance of family planning program
- 18-recognize the essential activities for birth control services

Instructional methods:

Lectures are the main method of teaching the course.

Text book and material:

- 1- Community medicine : with recent advances /
Author: Suryakantha, AH.
Publication: Jaypee Brothers Medical Publishers, New Delhi : 2010.
Edition: 2nd ed.
- 2- Principles of community medicine /
Author: Rao, B. Sridhar.
Publication: A.I.T.B.S. Pub., Delhi : 2010
Edition: 5th ed.
- 3- Selected articles and handout documents on community medicine (will be available to students as paper or electronic versions).

Grading methods:

- 4- There will be 3 exams comprised of multiple choice questions and short answers for makeup exams.
- 5- First.....30%
- 6- Second...30%
- 7- Final.....40%
- 8- Total100

Course Policies:

- **Late Assignments:** Students must give an explanation to the course instructor for any assignment which is submitted late. It will be at the course instructor's discretion if marks will be deduced for late assignments. Students are responsible for satisfying all academic objectives. Acceptable reasons for absence from class include illness, serious family emergencies, severe weather conditions and participation in official university activities.
- **Missed exam:** If students are absent for a reason approved above and have given prior notification to the instructor when possible, they will have to take part in the reset exams within one week after the missed exam. All other missed will receive grade of zero.
- **Absence:** If a student is absent for more than 25% of the sessions then they may be liable to fail the course.
- **Cheating** Cheating is forbidden in any form. Any students who are caught cheating will be reported to the Dean of the Faculty of Medicine and further action taken as necessary.

Classroom Protocol:

- Students are expected to attend all sessions and to arrive on time for lectures.
- Turn off all cell phones upon entering the classroom.
- Students may be engaged in class discussions and encourage the students to ask and/or answer questions of the instructor, keep side conversation to minimum.
- No drinks or food allowed in the classroom.
- Smoking is prohibited in the classroom.

- Cell phones are not allowed during exams.

Important Dates to Remember:

First Exam

Second exam

Final exam

Student rights and responsibilities:

These are as detailed in the University Regulations

Course schedule

Lectures 1- 4: Introduction

The concept of community medicine

- 1-What is community medicine
- 2- Aims and objectives of community medicine
- 3- Components of community medicine
- 4-Identify the role of community doctor
- 5- Components of Community Medicine:
 - a. Epidemiology
 - b. Vital statistics
 - c. Demography
 - d. School health
 - e. Mental health
 - f. Primary health care
 - g. Maternal health and Child health
 - h. Control of communicable diseases
 - i. Control of non communicable diseases
 - j. Environmental health
 - k. Occupational health
 - l. Nutrition
 - m. Health Service Administration
 - n. Health Education

Lectures 5-8: measures of population health

1-fertility indicators

- A. the crude birth rate
- B. the general fertility rates
- C. the specific fertility rate

2-mortality indicators

- A. the crude death rate
- B. the cause specific death rate

- C. the sex specific death rate
- D. the age specific death rate
- E. Case fatality rate

3-Morbidity indicators:

- A. Incidence rate
- B. Cumulative incidence rate
- C. Prevalence rate

Lectures 9- 12: What is epidemiology?

- A. Recent developments in epidemiology
- B. Definition, scope, and uses of epidemiology
- C. Epidemiology and public health
- D. Causation of disease
- E. Natural history of disease
- F. Health status of populations
- G. Evaluating interventions
- H. Achievements in epidemiology
 - Smallpox
 - Methyl mercury poisoning
 - Rheumatic fever and rheumatic heart disease
 - Iodine deficiency diseases
 - Tobacco use, asbestos and lung cancer
 - Hip fractures
 - HIV/AIDS
 - SARS

Lectures 13- 20: Disease Occurrence

A. Descriptive epidemiology.

- ❖ Characteristics of persons
 - Distribution of disease with age
 - Distribution of disease with marital status
 - Distribution of disease with sex
 - Distribution of disease with education and occupation
- ❖ Characteristics of place
- ❖ Characteristics of time
 - Secular changes
 - Seasonal changes

B. Analytical epidemiology:

- Risk
- Risk factor
- Relative risk

- Attributable risk
- Association: Types of statistical association
- Causal association : Epidemiological criteria (Bradford Hill criteria)
Biological criteria (Koch's Postulates).
- The concept of cause: Sufficient or necessary
Multiple factors
- Factors in causation

First Exam

Lectures 21- 25: The scope of prevention

- Health Transition
- Causes of Health Transition

Levels of prevention

- Primordial prevention
- Primary prevention - Population strategy
- High-risk individual strategy
- Secondary prevention
 - Screening
 - Types of screening
 - Requirements for the success of screening programme
 - Validity of a screening test
- Tertiary prevention

Lectures 26- 29: Primary health care

- 1- Concept of primary health care
- 2- Principle of primary care
- 3- Strategies for the delivery of primary health care
- 4- Component of primary health care

Maternal and Child Health (MCH)

Lectures 30- 34: Under five health services

- 1- Services for children under five.
 - Objectives of preventive, curative and follow up services for infants and preschool children
 - Growth monitoring
 - High risk babies and children

2nd exam

Lectures 35- 42 Maternal services

- 1- Antenatal care
- 2- Natal care
- 3- Postnatal care
- 4- Main maternal health problems
- 5- High risk pregnancy

Lectures 43-45: Expanded program on vaccination(EPI)

- 1- important of vaccination
- 2- Schedule of EPI
- 3- Contraindication to vaccinations
- 4- Components of cold chain

Lectures 46- 48: Family planning program

- 1- Importance of family planning program
- 2- Basic program components
- 3- Essential activities for birth control services
- 4- Factors favoring use of contraceptive method

FINAL EXAM

Course information

Course title	Medical Immunology
Course number	0111501208
Credit hours	3
Course date	June 2, 2013Sundays, Tuesdays, and Thursdays
Course meeting time	8.0 - 9.40 am
Course location	Allied Medical Sciences Theater
Instructor	Dr. Sameer Ahmad Naji Office Room 3036 third floor Office hours: Mondays and Tuesdays 11.30-15.30 Phone: 053903333 ext. 5365 E-mail: Sameer@hu.edu.jo

Course description:

Immunology is the discipline concerned with the study of the immune systems of animals and humans, systems that have evolved to protect against infection by pathogens such as microbes, viruses and parasites.

The course aims to provide a basic understanding of the immune system of mammals, with particular emphasis on human immunology and its relationship to health and disease. Immunology overlaps with many other biological disciplines including biochemistry, molecular biology, cell biology, genetics, physiology, microbiology , virology and parasitology; it relies on methods and concepts derived from these disciplines and in turn makes a major contribution to them and some of the newer disciplines such as biotechnology. The course aims to provide students with an appreciation of these relationships while providing a knowledge of the molecular and cellular basis of the immune system.

Learning outcomes:

Upon completion of the course, students will be able to:

1. Describe the various cells and organs involved in the immune system, including the role of each during an immune response.
2. Compare and contrast the innate and adaptive immune responses, including their specific components and effector mechanisms.
3. Describe the basic mechanisms of antigen presentation, in addition to antigen/antibody interactions, factors determining antigenicity, and cross-presentation.
4. Describe the immune response to infectious diseases, cancer, tissue transplants, and allergens.
5. Apply immunology concepts to solve clinical problems.
6. Work collaboratively in groups to solve course-related problems.

Instructional methods:

- Lectures-Power Point presentations
- Departmental hand-outs
- animations, educational movies, illustrations
- Self readings

Text book and material:

- Immunology for Medical Students, Nairn & Helbert, Latest Edition
- Essentials of Clinical Immunology, Chapel & Haeney, Latest Edition
- Basic Principles of Immunology, Kayser, Medical Microbiology, Latest Edition

Grading Policy:

First Exam: 30%
Second Exam: 30%
Final Exam: 40%
Total Points 100

Course Policies:

- **Missed exams:** Students who are absent in any exam are allowed to sit a make-up exam after presenting an approved sick leave or any accepted certificate of absence to the assistant of the faculty dean within 72 hours. The Course Coordinator will determine the time of the exam make-up session. Also, according to the Curriculum Committee and the University regulations, the student will be given a similar examination given to the other students. All examinations must be made up within one week of returning to class. Those absents who do not present a clue will be given a zero mark.
- **Absence:** Professionalism is a major component of our medical curriculum. We believe students should conduct themselves appropriately in the various educational activities of the curriculum. This conduct includes coming to educational activities on-time. The faculty should also demonstrate professionalism, by starting and ending all scheduled educational activities on time and providing a course schedule with clearly explained course policies in the course syllabus. Any changes in the schedule should be given to the students in a timely manner.

Students will be accountable and personally responsible for attending all educational activities (lectures, labs, examinations, etc.). Unexcused absences reflect negatively on the goals and objectives of the medical curriculum and demonstrate unprofessional behavior by the respective student.

Attendance is mandatory. Students are expected to attend all scheduled activities. Students are expected to be on time. Being on time is defined as being ready to start at the assigned time. If a student has an emergency that prevents her/him from attending a scheduled activity, s/he has to notify the Course Coordinator and present an approved sick leave or any accepted certificate of absence by the faculty dean assistant.

Students who exceed the 15% limit without a medical or emergency excuse acceptable to and approved by the Dean of the faculty shall not be allowed to take the final examination and

shall receive a mark of zero for the course. If the excuse is approved by the Dean, the student shall be considered to have withdrawn from the course.

- **Cheating:** Cheating will not be tolerated. Each individual student is responsible for his behavior and is expected to maintain standards of academic honesty and professionalism. If any instance of academic dishonesty (cheating, plagiarism, etc.) is discovered by a coordinator or an instructor, it is his or her responsibility to take appropriate action. Such action may include giving a failing grade to the student in the course and/or referring the student for Judicial Procedures Office review and possible disciplinary action, which may include disciplinary suspension or dismissal from the College.

Classroom Protocol:

Professionalism is a major component of our medical curriculum. We believe students should conduct themselves appropriately in the various educational activities of the curriculum. This conduct includes coming to educational activities on-time. The faculty should also demonstrate professionalism, by starting and ending all scheduled educational activities on time and providing a course schedule with clearly explained course policies in the course syllabus. Any changes in the schedule should be given to the students in a timely manner.

Students respond politely to faculty, staff, and student colleagues, exemplifying their maturity and empathy. Students agree to abide by appropriate biosafety practices when required.

All students are expected to be quiet in their seats in the lecture theatre before the start of the lecture. Engagement in class discussions is encouraged without side chatting.

Cell phones are not allowed to be used during lectures and exams unless prior approval has been taken from the course instructor.

Important Dates to Remember:

06 June 2013 - Course Start

24 June – First Exam

15 July – Second Exam

25 July – Final Exam

Course Schedule :

SUBJECT	INSTRUCTORS
General introduction to the immune system Objectives: 1. Discuss why we need an immune system. 2. Outline the major principles of the human immune response.	Dr. Sameer Naji
Principles of innate immunity Objectives: 1. Discuss the concept of innate immunity - features,	Dr. Sameer Naji

importance. 2. Explain how the innate immune system recognizes foreign antigens in general. 3. Outline the components of the innate immune system. 4. Discuss how these components combat various foreign antigens.	
Principles of adaptive immunity Objectives: 1. Explain the evolutionary forces behind adaptive immunity 2. Introduce the concept and significance of self/non-self discrimination 3. Outline the immune cells that mediate adaptive immunity and their specific roles in immune response to varying pathogens/antigens 4. Discuss the differences between cell-mediated immunity and humoral immunity 5. Explain what interactions are required for activation of T and B cells 6. Discuss immunological memory and outline the differences between primary and secondary (memory) responses 7. Compare and contrast the innate and adaptive immune response	Dr. Sameer Naji
Antigen presentation Objectives: 1. Understand antigens and epitopes 2. Understand the role of MHC molecules 3. Understand antigen processing 4. Immune Evasion 5. Discuss the role of antigen presentation in generating immunity	Dr. Sameer Naji
Lymphocyte trafficking Objectives: 1. Lymphoid system structure/lymphatics 2. Lymph node trafficking.	Dr. Sameer Naji
Overview of Immunoglobulin function Objectives: The lecture will discuss the role of Ig in neutralization, opsonization, antibody-dependent cellular cytotoxicity (ADCC), complement and mucosal immunity.	Dr. Sameer Naji

Cell-mediated immunity: induction and regulation

Objectives:

1. Provide an overview of CMI.
2. Discuss key CMI reactions.
3. Review regulation of CMI.
4. Discuss viral counterstrikes against CMI.

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Antigen recognition and lymphocyte maturation

Objectives:

1. Provide an overview of the structure and functions of lymphocyte antigen recognition receptors
2. Outline the genetic mechanisms for generation of diverse antigen receptor specificities
3. Overview selection mechanisms operating during lymphocyte maturation to ensure that the repertoire of expressed antigen receptors is functional and non-harmful
4. Discuss in some detail positive and negative selection occurring in the thymus

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Cellular activation in the immune system: Signal transduction

Objectives:

1. Provide an overview of the basic concepts of signal transduction (definitions, modes of signaling, signal amplification, signal integration, importance of cellular context)
2. Discuss the unique signaling challenges within the immune system
3. Identify four broad stages in signal transmission from the membrane to the cytoplasm (I-R-A-E)
4. Compare and contrast the signal transmission mechanisms used by five major families of signaling receptors of immunological importance (Ig superfamily receptors, cytokine receptors, chemokine receptors, tumor necrosis factor receptor family and TOLL-like receptor family)

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Tumour Immunology

Objectives:

1. Discuss immune protection against tumors
2. Discuss immune mediated tumor growth
3. Discuss mechanisms of metastasis
4. Provide an overview of experimental cancer therapies

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Disorders of the immune system: Autoimmunity and tolerance

Objectives:

1. Define and discuss the general characteristics of tolerance
2. Define the main factors that influence the development of tolerance
3. Identify the main mechanisms of tolerance induction in B and T cells
4. Identify the mechanisms involved in the development of autoimmunity
5. Identify and discuss 3 animal models of autoimmune diseases
6. Approach to treatment of autoimmune diseases

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Inflammation

Objectives:

1. Overview of the inflammatory process: initiation, inflammation, resolution: Benefits and liabilities
2. Major constituents
3. Clinically relevant inflammatory processes
4. Control of inflammation

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Vaccines: Principles and Practice

Objectives:

1. To understand the types of currently used vaccines, the differences, and the mechanisms of protection
2. To understand how to develop a vaccine and the general requirements for vaccine development and adjuvants
3. To understand the new concept of vaccines against non-microbes such as self or tumor molecules

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Disorders of the immune system: Hypersensitivity states I-IV

Objectives:

1. What is the difference between hypersensitivity and protective immunity?
2. Overview of the four major classifications of human hypersensitivity.
3. a) Type I hypersensitivity – Mechanisms (allergens, Th2 immunity, IgE, immediate and late phase reactions) and clinical overview
b) Type 2, 3,4 hypersensitivities – Mechanisms and clinical consequences
4. Currently practiced vs. novel (experimental) approaches to clinical management of type I hypersensitivity.

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Course Contents and Schedule:

Date	Topic
First Week	- Introduction to the Immune System - Basic Concepts & Components of the Immune - System and Introduction to Antigen Recognition - Antigens and Antibody Structure - Antibody - Antigen Interaction
Second Week	- Antibody Diversity & the T- Cell Receptor - Major Histocompatibility Complex - Antigen Processing and Presentation - Lymphocyte Activation - Hematopoiesis & The Organs and Tissues of the Immune System
Third Week	- B-Cell Development - T-Cell development - Cell-Cell Interaction in Generating Effector Lymphocytes - Immunological Memory - <i>The First Exam</i>
Forth Week	- Innate Immunity: Constitutive Defenses Including Complement - Phagocytes - Killing in the Immune System - Inflammation & Cytokines of the Immune System
Fifth Week	- Infections and Vaccines - Hypersensitivity Reactions - Immediate Hypersensitivity (Type I): Allergy - Autoimmune Disease Development - Antibody-Mediated Hypersensitivity (Type II) - <i>The Second Exam</i>
Sixth Week	- Immune Complex Disease (Type III Hypersensitivity) - Delayed Hypersensitivity (Type IV) - Primary Immunodeficiency - Secondary Immunodeficiency

Seventh Week

- Transplantation
- Tumor Immunology
- Monoclonal Antibodies and Recombinant Cytokines
- Review

Last Weeks

- *The Final Exam (25 July 2013)*

Course information

Course title	Molecular genetics
Course number	111501201
Credit hours	3
Course date	September, First semester.
Course meeting time	September, Second year medical students.
Course location	Faculty of medicine lecture halls
Pre-requested course	General Biochemistry (111501107), Histology & Molecular biology (011501105)
Instructor	Prof. Muayad Mehdi Abboud Office Room: Faculty of medicine building, Third floor, Room 3017 Office hours: Monday and Wednesday, 11.0-13.0. Phone: 053903333 ext. 5573 E-mail: muayadabboud@yahoo.com

Course description:

This course describes the gene at the molecular level by exploring the main differences between genotype and phenotype in addition to the differences between genes and chromosomes. Also, there is emphasis on the diverse functions of chromosomal DNA including the storing of genetic information, DNA replication, regulation of gene expression and DNA repair. Furthermore, special focus is given to the applications of recombinant DNA technology in the diagnosis of congenital diseases .

Learning outcomes:

- Learning variety of techniques on human genetics and molecular biology.
- Understanding the genetic variations that contribute to the causes of human genetic diseases.
- Become familiar with the diagnostic tools that are used in the diagnosis and monitoring of genetic diseases.
- Gaining new knowledge on the subjects of human genome organization, somatic and germ line mutations, selective gene expression and its regulations during cellular differentiation, the manipulation of recombinant DNA technology in human gene cloning, types of congenital diseases and recent attempts in gene therapy.
-

Instructional methods:

- Lectures as power point presentations
- Departmental hand-outs
- Reference text books

Text book and material:

- 1. Human molecular genetics by Sudbery P.
- 2. Lippincott's Illustrated Reviews: Biochemistry

Grading Policy:

First in-course exam (MCQ):	30 %
Second in-course exam (MCQ):	30 %
Final exam at end of the semester (MCQ):	40 %
Total Points	100

Course Policies:

- **Late Assignments:** Students should give an explanation to the course instructor for any late submitted assignments. It will be at the course instructor's discretion if marks will be deducted for late assignments.
- **Missed exams:** Will be compensated later by make-up examination according to the university regulations.
- **Absence:** Students are encouraged to make maximum attendance at lectures, but an absence of more than 25% from the course makes the student liable for a course failure.
- **Cheating:** Cheating is not tolerated and proved cases will be reported to the dean for further actions to be taken according to the university regulations.

Classroom Protocol:

Students are expected to stick to the fixed time table of sessions and behave politely during lectures attendance. Mobile phones should be switched off during the lecture period while eating, drinking and smoking are not allowed.

Important Dates to be remembered

- Lectures begin at first week of the semester.
- Dates of first, second and final examinations will be notified at the beginning of the semester.

Students rights and responsibilities

These are detailed in the University regulations

Course Schedule

Lecture Title	Lecture outline
Introduction	1. Definition of molecular genetics 2. Integration of molecular genetics to other sciences 3. Clinical goals of molecular genetics 4. Outlines of syllabus being selected
Genotype and Phenotype	1. Description of human genotype 2. Comparison of human genotype with bacterial genotype 3. Packaging of DNA in chromatin and chromosome forms 4. Evidence that DNA is the genetic material
The Gene	1. Explaining the gene arrangement and locations on the chromosome 2. What is the gene action? 3. Differences in structure between prokaryotic and eukaryotic genes 4. Arrangement of gene families 5. Behavior of the gene during meiosis
The chromosomes	1. Chromosome structure 2. Position of alleles on chromosomes 3. Brief description of natural DNA recombination 4. Mentioning the behavior of linked genes during meiosis
The DNA	1. What is the structural unit of DNA build up 2. Describing double helix structure 3. Mentioning the importance of DNA strand complementation 4. Supercoiled DNA as a tertiary structure
Functions of DNA as a store of genetic information	1. Central dogma for transfer of genetic information 2. Semiconservative DNA replication 3. Mechanisms of DNA replication 4. Differences between prokaryotic and eukaryotic DNA replication 5. Special replication of telomere ends
DNA repair	1. Outlines types of DNA damages 2. Human DNA repair systems against chemical and UV damages 3. Xeroderma pigmentosum genetic variants with

	defect in dimmers excision repair
Gene expression	1.RNA transcription in prokaryotes 2.RNA transcription in eukaryotes
Types of RNA	1.Structure of transfer RNA 2.Ribosomal RNA as structural component of the ribosome 3.Function of messenger RNA as carrier of genetic information
Protein synthesis	1.General properties of the genetic codes 2.Mechanism of RNA translation in prokaryotes 3.Antibiotics that act as specific inhibitors of prokaryotic RNA translation 4.RNA processing in eukaryotes 5.Differences between RNA translation of prokaryotes and eukaryotes
Regulation of gene expression	1.Lac operon as a model of gene regulation in prokaryotes 2.Glucose catabolite repression of other metabolite in Prokaryotes 3.Positive activation of gene regulation in eukaryotes 4.Chromatin remodeling in facilitating gene expression 5.Role of activators in tissue selection during differentiation 6.Steroid hormone receptors as gene activators 7.Post-translational control of protein formation
Mutation	1.Germ line verses somatic mutation 2.Types of point mutations 3.Chromosomal mutations 4.Conditional mutations
Forward and reverse genetics	1.The technique of investigating the proteins from knowledge on its genetic origin 2.Exploring genetic information backward from the nature of gene products
Recombinant DNA technology	1.The role of restriction enzymes in recombinant DNA 2.DNA cloning as a method of human gene copying 3.Polymerase chain reaction(PCR) as an amplification method of genes <i>in vitro</i>
Gene identification	1. Probing of the gene with complementary labeled sequence 2.Explaining the technique of DNA blotting

	• Southern Blot • Northern blot 3.DNA sequencing
The Human Genome Project	1.Goals of the human genome project 2.Sequencing the human genome
Types of congenital diseases	1. Monogenic disorders • Autosomal - o Recessive - o Dominant • Sex linked 2. Polygenic disorders
Clinical implications of Molecular genetics	1.DNA fingerprinting in forensic medicine 2.Use of repetitive sequence length polymorphism in the diagnosis of congenital diseases
Methods of gene transfer to human chromosome	1.<i>ex vivo</i> technique 2.<i>in vivo</i> technique 3.Gene transfer vehicle
Gene therapy	1. Types of gene therapy 2. Gene therapy attempts for cystic fibrosis 3. Gene therapy attempts for Duchenne muscular dystrophy

Learning Objective

At the end of this course student should be able to understand:

- The structure and function of genes at the molecular level.
- The genetic variations that contribute to the causes of human genetic diseases.
- Become acquainted with the diagnostic tools that are used in the diagnosis and monitoring of genetic diseases
- The project of human genome
- Gene expression and its regulation

Course information:

Course title	Respiratory System
Course number	111501205
Credit hours	5
Course date	5 weeks, 2 nd Semester, Year 2
Course meeting time	According to the Faculty of Medicine Timetable
Course location	Faculty of Medicine, Hashemite University
Instructor	Prof. Faik Hussain Mohammed Office 3013 Telephone Ext 5435 Office hours Monday and Wednesday 10am - 12pm Email faikalkulib@yahoo.com

Course description:

This course describes the role of the respiratory system in gas exchange and acid – base balance in the body. It covers the structural and functional aspect. It involves in an integrated knowledge of micro-organisms, allergens, and environmental pollution, specially smoking for causing respiratory diseases, in relation to their epidemiology and community aspects and the pharmacological principles of treating common respiratory diseases.

Learning outcomes:

Upon completion of this course student should be able to:

1. Identify and describe structures of respiratory organs, as well as their development, histology and blood supply.
2. Understand the mechanics of pulmonary ventilation and the mechanisms involved in the regulation of respiration.
3. Explain how the respiratory gases are exchanged and transported by the blood
4. Identify various bacteria, viruses, parasites and fungal infections which infect the respiratory tract and to understand the principles of diagnosis, treatment and prevention.
5. Identify and describe the causes, pathogenesis, morphological changes and complications of various disease processes which affect the respiratory tract.
6. Understand the pharmacological principles which provide the basis for the treatment of tuberculosis, cough and bronchial asthma, as well as the pharmacology of anti-histamine drugs.
7. Identify the major risk factors which contribute to occupational diseases of the respiratory system and to understand their epidemiological pattern in the Jordanian community.

Instructional methods:

The course will be taught through a combination of lectures and practical classes as an integrated system module.

Text books and material:

Anatomy:

- Clinical Anatomy by system. By R.S. Snell.
- Grants Atlas of Anatomy or any other reasonable colored atlas of Human Anatomy.
- Before we are born. By K.L. Moore and T.V.N. Persaud, 5th edition 1998.
- Basic Histology, by L.Carlos Junqueira, 10th. Edition 2004/or functional histology by Wheater (latest edition)
- Supplementary Departmental Handouts.

Biochemistry:

- Campbell, 2006 or latest edition.
- Supplementary Departmental Handouts.

Physiology:

- Textbook of Medical Physiology, by Guyton and Hall, 11th edition.
- Supplementary Departmental Handout.

Microbiology:

- Medical Microbiology. An Introduction to Infectious Diseases. By Sheries, latest edition.

Pathology:

- Basic Pathology, by Kumar, Cotran and Robbins, 8th. edition, 2007.
- Supplementary Departmental Handouts.

Pharmacology:

- Lipincott's Illustrated Reviews: Pharmacology, 2nd edition, 2000.

Grading Policy:

- In-course theory exam = 40%
- In-course practical exam = 20%
- Final course theory exam = 40%

Total Points 100

Course Policies:

- **Late Assignments:** Students must give an explanation to the course instructor for any assignment which is submitted late. It will be at the course instructor's discretion if marks will be deducted for late assignments.
- **Missed exams:** If a student misses an examination then they will have the opportunity for a make-up examination, according to the University Regulations.
- **Absence:** If a student is absent for a teaching session then they must discuss this with the course instructor. If a student is absent for more than 25% of the course then they may be liable to fail the course.
- **Cheating:** Cheating is forbidden in any form. Any students who are caught cheating will be reported to the Medical Dean and further action taken as necessary.

Classroom Protocol:

Students are expected to attend all sessions and to arrive on time for lectures and practical sessions. It is each student's responsibility to know their timetable and which session they should attend on which day. Students are expected to behave respectfully towards all members of staff and each other. Mobile phones are to be switched off during teaching sessions and eating, drinking and smoking are forbidden.

Important Dates to Remember:

Lectures will begin the first week of the semester.

Practical sessions will begin the second week of the semester.

The dates and locations of written and practical examinations will notified at the beginning of the semester

Student rights and responsibilities:

These are as detailed in the University Regulations

Course Schedule:

Physiology

Lecture No.	Lecture Title	Lecture outline
1	Mechanics of breathing I	1. review anatomy of the lung, both macro and micro 2. what is meant by the process of external respiration & it's mean steps 3. how air at atmospheric pressure flows into the lung during inspiration 4. muscles involve in creating a sub-atmospheric air pressure within the lung during inspiration 5. what are the non-respiratory functions of the lung?

2	Mechanics of breathing II	1. how intra-pleural pressure is created? what is meant by the alveolar, and trans-pulmonary pressures? 2. the changes in intra-pleural, alveolar, trans-pulmonary, alveolar pressures and changes in lung volume 3. what are the factors that resist expansion of the lung? the tissue elements and the alveolar surface tension. 4. define compliance of the lung 5. the physical principles of airway resistance, chief site in the lung, and physiological factors that affect it.
3	Pulmonary volumes and capacities	1. define spirometry 2. describe the significance of the major volume and capacities that are recorded during normal function test. 3. describe the techniques used to determine the residual volume. 4. forced expiratory volumes and the differentiation between obstructive & restrictive respiratory dysfunction
4	Ventilation	1. describe pulmonary and alveolar ventilation 2. does all the inspired air participate in gas exchange, the anatomic and physiologic dead spaces. 3. effect of breathing patterns on alveolar ventilation 4. the mechanism of regional differences in ventilation.
5	Pulmonary circulation	1. compare the pulmonary and systemic circulations listing the main differences between them. 2. characterize pressures in the pulmonary system 3. describe the uneven distribution of blood flow through the lungs 4. describe the fluid balance mechanism of pulmonary edema
6	Physical principles of gas exchange	1. describe the concept of gas partial pressure. 2. mention PO₂ & PCO₂ in inspired air, alveolar air, and expired air. 3. mention the arterial and venous PO₂ and PCO₂. 4. discuss the diffusion of O₂ and CO₂ through the respiratory membrane.
7	Ventilation/perfusion relationship	1. describe the primary function of the lung, that is, gas exchange 2. review three mechanisms of hypoxemia:

		hypoventilation, diffusion limitation , and shunt 3. the concept of ventilation-perfusion inequality 4. examine how ventilation-perfusion inequality impairs overall gas exchange
8	Transport of O₂ by the blood	1. describe the forms by which O₂ is transported by the blood. 2. discuss the O₂ – hemoglobin dissociation curve. 3. describe factors affecting O₂ – hemoglobin dissociation curve. 4. Bohr effect
9	Transport of CO₂ by the blood	1. describe the forms by which CO₂ is transported by the blood. 2. describe Haldane effect.
10	Control of ventilation	1. the central control of ventilation 2. the sensors; various chemoreceptors that provide the respiratory center with information 3. describe the integrated responses to CO₂, hypoxia, and pH 4. regulation of ventilation in chronic respiratory failure

Anatomy Lectures

#	Title of Lecture	Lectures outline
1	Overview of Anatomy of the Respiratory System	1. Describe the general structures and organs of the respiratory system. 2. Compare and relate the structure and function of the different components of the respiratory system. 3. Understand the essentials of the respiratory system 4. Describe the anatomical and functional subdivisions of the Respiratory system.
2 & 3	Upper Respiratory System: External nose, Nasal Cavity, Pharynx, Lower	1. Describe the structure of the external nose with its blood and nerve supply. 2. Describe the structure of the nasal cavity including the nasal septum. 3. Locate the openings of the paranasal sinuses and naso-lacrimal duct in the meatuses. 4. Describe the nerve and blood supply of the nasal cavities, and its relation to epistaxis.

	Respiratory System: Larynx	5. Study the structure of the nasopharynx, oropharynx, and laryngopharynx and associated structures with their clinical significance. 6. Describe the structure of the various cartilages and membranes of the larynx. 7. Describe the muscles of the larynx, including their actions, nerve and blood supply. 8. Study the structure of the vocal cords and the mechanism of voice production.
4	Lower Respiratory System: Pleura, lung and Mediastinum	8. Describe the trachea including its subdivisions and relations. 9. Define pleura and pleural cavity, and name its parts and recesses. 10. Discuss the nerve supply of the pleura. 11. Describe the lungs, their lobes, fissures and surfaces and compare between right and left lungs. 12. Make a list of bronchopulmonary segments. 13. Describe the innervation, blood supply and lymphatic drainage of the lungs. 14. Identify different parts and contents of the mediastinum. 15. Study the origin, location, course and branches of the internal thoracic artery. 16. Define the surface markings of the trachea, lungs and pleura. 17. Describe the typical appearance of chest X-ray
5	Thoracic cage, Thoracic wall & Respiratory muscles	1. Describe the shape and outline of the thoracic cage. 2. Describe the anatomical landmarks of the anterior chest wall. 3. List the various structures making the thoracic wall. 4. Make a list of muscles of the thoracic wall including their nerve, blood supply and actions. 5. Classify ribs, name their various parts. 6. Define intercostal spaces and discuss their various components including intercostal muscles. 7. Describe the diaphragm, its origin, insertion, function, nerve and blood supply. Study openings in the diaphragm and structures pass through.
6	Histology of Respiratory System	1. Describe the microscopic structure of the upper respiratory passage. 2. Correlate the structure and expected function of the nose, pharynx larynx and trachea. 3. Study the microscopic structure of the main bronchi and their subdivisions. 4. Study the microscopic structure of the lung parenchyma and

		correlate this structure with gas exchange function.
7	Pre- and Post-natal Development of Respiratory System	1. Describe the development of the nasal cavity. 2. Describe development of the pharynx and larynx. 3. Describe the development of the lungs and bronchi.

Biochemistry Lectures

#	Lectures Title	Lectures outline
1	Acid-base balance & the respiratory system	1. Describe the bicarbonate buffer system 2. Describe the biochemical changes in respiratory acidosis & alkalosis
2	Role of hemoglobin in acid base balance	1. Describe the role of hemoglobin in the buffer system 2. Describe the oxyhemoglobin dissociation curve
3	Phospholipid Metabolism	1. Describe the biochemical structure, synthesis and role of lung surfactant in respiratory distress syndrome 2. Describe the functional role of α 1-antitrypsine in maintaining lung elasticity, the molecular basis of emphysema 3. Describe the molecular basis of cystic fibrosis
4	Arterial Blood Gases (ABG)	1. Describe the distribution of blood gases 2. Know the effect of increase or decrease of blood gases

Pathology Lectures

No.	Lectures Title	Lectures outline
1	Obstructive Lung diseases (I)	Describe the Normal Alveolar Wall. Define Emphysema & Chronic Bronchitis. Describe the Etiology, Pathogenesis, Types, Pathologic (Gross & Microscopic) Features, Effects, & Complications Of The Centrilobular & Panacinar Emphysema (E). Define & Differentiate each of the following conditions from true emphysema: (1) Compensatory E, (2) Obstructive E, (3) Bullous E, & (4) Mediastinal (interstitial) E.
2	Obstructive Lung	Describe the etiology, types, pathogenesis, pathologic

	diseases (II)	features, effects & complications of: (1) Chronic Bronchitis , (2) Asthma , & (3) Bronchiectasis .
3	Acute Respiratory Distress Syndrome & IPF	List the Disorders Associated With Acute Respiratory Distress Syndrome (ARDS) . Describe the Pathogenesis, Gross & Microscopic Features, & Effects of ARDS . Classify the Major Categories Of Chronic Interstitial Lung Disease , & Describe Its Pathogenesis. Describe the Gross & Microscopic Features Of Idiopathic Pulmonary Fibrosis (IPF) .
4	Pneumoconioses & Sarcoidosis	Describe the: Types, Pathogenesis, Gross & Microscopic Changes, Effects & Complications of: (1) Coal Workers' Pneumoconiosis , (2) Silicosis , & (3) Asbestosis . Define Drug-Induced & Radiation-Induced Pulmonary Diseases (acute radiation pneumonitis) Describe the: Pathogenesis, Sites Of Involvement, Gross & Microscopic Features, Effects & Complications Of Sarcoidosis In The Lung & In The Other Organs
5	Atelactasis. Pulmonary Embolism, Infarction Hemorrhage, & Hypertension	Enumerate the Causes & Effects Of Resorption, Compression, & Contraction Atelactasis. Describe the (1) Risk Factors Of DVT , & (2) Different Effects of pulmonary thromboemboli . Describe the Pathologic Features, Clinical Effects, & Fate Of pulmonary infarcts . Describe the Causes, Pathogenesis, Pathologic Features & Effects Of Pulmonary Hypertension . Describe the Pathogenesis, Pathological Features & Effects Of Goodpasture Syndrome . Enumerate the Lung Defense Mechanisms Against Infection. Define Bronchopneumonia & Lobar pneumonia. List the Seven Pneumonia Syndromes.
6	Pneumonias (I)	Describe <i>Pneumococcus Pneumonia</i> {the commonest cause of (I) Community Acquired Pneumonias} predisposing factors, patterns {(a) Lobar pattern Four Stages (Congestion, Red, & Gray Hepatization, & Resolution) & (B) Bronchopneumonia Pattern} Pathologic Features, &

		Complications. Comment briefly on the pathology of other Community Acquired pneumonias caused by: <i>Haemophilus influenzae</i>, <i>Moraxella</i>, <i>Staph aureus</i>, <i>Klebsiella</i>, <i>Pseudomonas</i>, & <i>Legionella</i>. Comment briefly on the Pathology of : (II) Community-Acquired Atypical Pneumonias due to <i>Mycoplasma pneumoniae</i> & Influenza. (III) Nosocomial (hospital-acquired) Pneumonias. (IV) Aspiration Pneumonia. Describe 6 Mechanisms For Microorganism Introduction, Pathologic Features, & Complications of the (V) Lung Abscess (Necrotizing Pneumonia).
7	Pneumonias (II)	Describe Tuberculosis {the commonest cause of (VI) Chronic Pneumonias} Etiology, Epidemiology, Predisposing Factors, Difference Between Infection & Disease, Tuberculin Skin Test, Pathogenesis, & The Typical Tb Granuloma. Describe the Source, sites, Types, Gross features, Fate, & Complications of (a) Primary TB, (b) Post-Primary TB, (c) Pulmonary Miliary TB, (d) Systemic Miliary TB. Comment on fungal pneumonia (VII) Pneumonia in the Immunocompromised Host.
8	Lung carcinoma	Classify lung tumors. Describe the: Etiology, Pathogenesis, Pathologic Features, & Routes Of Spread Of The Four Types Of Lung Carcinoma (Squamous, Adeno-, Large & Small Cell Type).
9	Pleural lesions, Nasopharyngeal & Laryngeal cancers	Describe the Pathologic Features & Effects Of Typical & Atypical Pulmonary Carcinoids. Enumerate the Causes, & Complications of Hydro-, Pyo-, Pneumo-, Hemo-, & Chylo- thorax. Describe the Etiology, Pathogenesis, Gross & Microscopic Features, Routes Of Spread of: (a) Malignant Mesothelioma, (2) Nasopharyngeal carcinoma & (3) laryngeal carcinoma.

Microbiology Lectures

#	Lecture title	Lectures outline
1	Upper respiratory tract infections	1. Define the Upper respiratory tract infections. 2. Be familiar with the clinical picture of the different upper respiratory tract infections such as Rhinitis, Pharyngitis and tonsillitis, Stomatitis, Peritonsillar or retrotonsillar abscesses, Retropharyngeal or lateral pharyngeal abscesses. 3. Be familiar with the major infectious causes of the upper respiratory tract infections. 4. Be familiar with the primary diagnostic approaches in pharyngitis and tonsillitis. 5. Be familiar with the general principles of management.
2	Lower respiratory tract infections	1. Define the Middle and Upper respiratory tract infections. 2. Be familiar with the clinical picture of the different middle respiratory tract infections such as Epiglottitis, Laryngitis, laryngotracheitis, Bronchitis, Tracheobronchitis, and Chronic bronchitis. 3. Be familiar with the clinical picture of the different lower respiratory tract infections such as Acute pneumonia (Bronchopneumonia, and Lobar pneumonia), Chronic Pneumonia and Lung abscess. 4. Be familiar with the major infectious causes of the middle and lower respiratory tract infections. 5. Be familiar with the primary diagnostic approaches. 6. Be familiar with the general principles of treatment and prevention.
3	<i>Streptococcus pneumoniae</i> and other Spp.	1. Describe morphology, and cultural characteristics of this group. 2. Be familiar with the virulence, pneumococcal capsule, toxins, extracellular enzymes, antimicrobial susceptibility, and diseases. 3. Be familiar with the laboratory diagnosis. 4. Be familiar with the general principles of treatment and prevention.
4	<i>Corynebacterium diphtheriae</i> , <i>Bordetella pertussis</i> & <i>Haemophilus influenzae</i>	1. Describe the morphology and structure of <i>C. diphtheriae</i>, <i>B. pertussis</i> & <i>Haemophilus influenzae</i>. 2. Describe their growth and pathogenesis. 3. Explain immunity, transmission and epidemiology. 4. Be familiar with different types of their infections. 5. Be familiar with the laboratory diagnosis. 6. Be familiar with the general principles of treatment and the prevention.
5	Influenza virus	1. Identify group characteristics of Influenza virus. 2. Describe infections caused by respiratory viruses. 3. Define the antibody response. 4. Explain the epidemiology.

		5. Be familiar with the laboratory diagnosis. 6. Be familiar with prevention and treatment.
6	Pseudomonas , Moraxella and Bacillus Anthracis	1. Describe morphology and structure of the group. 2. Describe their growth, classification, toxins and extracellular products. 3. Explain their pathogenesis, immunity and clinical manifestations. 4. Explain their mode of transmission and epidemiology. 5. Be familiar with related laboratory diagnosis. 6. Be familiar with their treatment and prevention. 7. Describe morphology and structure of the group. 8. Describe their growth, classification, toxins and extracellular products. 9. Explain their pathogenesis, immunity and clinical manifestations. 10. Explain their mode of transmission and epidemiology. 11. Be familiar with related laboratory diagnosis. 12. Be familiar with their treatment and prevention.
7	Mycoplasma and Legionella	1. Describe the morphology, growth and staining of the group. 2. Explain their pathogenesis, immunity and clinical disease. 3. Explain their mode of transmission and epidemiology. 4. Be familiar with the related laboratory diagnosis. 5. Be familiar with their treatment and prevention.
8	Paragonimus westermani and hydatid cyst	1. Describe the morphology of the organism. 2. Describe the epidemiology and clinical manifestations. 3. Be familiar with the related laboratory diagnosis. 4. Be familiar with treatment and prevention.
9	Fungal infections	For each of Histoplasma capsulatum, Coccidiomycosis, Asperogillus, Mucormycosis and Rhizopus: 1. Describe the morphology. 2. Explain the pathogenesis and immunity. 3. Explain the epidemiology. 4. Discuss the clinical manifestations. 5. Discuss diagnosis and treatment.
10	Mycobacterium tuberculosis	1. Describe morphology, staining and cultural characteristics of the organism. 2. Explain the range of pathogenicity, resistance, antigenic structure, virulence mechanisms and antimicrobial susceptibility. 3. Be familiar with tuberculosis, routes of infections and reactivation. 4. Explain the immunity, transmission and epidemiology. 5. Describe relevant laboratory diagnosis. 6. Define the immunoprophylaxis.

Pharmacology Lectures

1 & 2	Treatment of bronchial asthma 1&2	1. Describe the pathophysiology, etiology and clinical presentations with special emphasis on factors known to provoke the attacks of bronchial asthma. 2. Understand the aims of therapy of bronchial asthma. Be familiar with some examples of drugs that can be used in the treatment of bronchial asthma with their method of administration, mechanisms of action, pharmacokinetics and side effects, such as : Beta agonists, Corticosteroids, Anticholinergic agents, Theophylline, Mast – cell stabilizers, Anti-leukotriens and Others
3 & 4	Treatment of respiratory bacterial infections.	1. Understand the pharmacokinetics, mechanism of action and adverse effects of drugs commonly used in the treatment of pulmonary bacterial infections.
5	Histamine and anti-histamines 1	1. Review histamine synthesis, storage, release, actions and the clinical manifestations of histamine shock. 2. Understand the mechanisms of actions of anti-histamine drugs. 3. Be able to classify, understand the pharmacokinetics, uses and adverse effects of anti-histamine drugs.
6	Treatment of tuberculosis	1. Understand the concepts of TB treatment with special emphasis on two phases of therapy. 2. Understand the concepts of combination therapy particularly the advantages and disadvantages with special emphasis on TB management. 3. Describe the mechanisms of action, pharmacokinetics, uses and side effects of Isoniazid, Rifampin, and Ethambutol. In addition, pyrazinamide as first line therapy of tuberculosis.
7	Treatment of cough	Understand the pathophysiology of cough. Understand the sites of actions of anti-tussives given example Understand the mechanism of action of mucolytic agents and give examples

PRACTICAL SESSIONS

Physiology Lab

No.	Practical Title	Objectives
1	Spirometer with pneumotach	1. Explain that the spirometer is designed to measure Lung volume & the pneumotach to measure the flow rate (volume per unit of time) 2. Discuss the purpose of performing PFT 3. What are the normal values for lung volumes & capacities. The effect of age, gender, body height, and race 4. Demonstrate the recording of lung volumes & VC 5. The recording of FVC, FEV1, FEV%, PEFR, FEF25% - 75% Explain how they are used to differentiate obstructive from restrictive respiratory dysfunction

Anatomy Lab

#	Practical Title	Objectives
1	Histology of Respiratory Tract	1. Identify the microscopic structure of the nasal mucosa, larynx and trachea
2	Anatomy of the Upper respiratory tract, thoracic cage, thoracic wall and respiratory muscles	1. Identify the different parts of the external nose, nasal cavity, nasal septum and nasal walls including conchae and meatuses with their associated openings. 2. Identify the different parts of the laryngeal skeleton, ligaments and membranes including the vocal and vestibular folds. 3. Identify the different parts of the laryngeal cavity and the rima glottidis. 4. Identify the muscles of the larynx. 5. Revise surface markings of the larynx and site for emergency tracheostomy. 6. Identify different parts of the pharynx and the associated structures including the tonsils and comment on their clinical significance. 7. Revise the gross, surface and radiological anatomy of the trachea. 8. Identify different components and joints of the thoracic cage. Identify the principal respiratory muscle: intercostals and diaphragm.
3	Pleura, Lungs & Mediastinum	1. Identify the different parts of pleura and their recesses. 2. Identify different parts of the lung and contrast between right and left lung.

		3. Identify structures entering and leaving the hilum of the lung. 4. Identify important structural relations to each lung that leave impressions on them. Identify different parts of the bronchial tree. 1. Identify the radiological appearance of the lungs, trachea, and bronchial tree.
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Pathology Lab

#	Practical Title	Objectives
1 & 2	Respiratory diseases	After reviewing and discussing the colored photographs of the: (1) gross specimens and of the (2) histopathological sections given in the above lectures as a power point presentations during the practical hours... The student should be able to identify, describe and diagnose the common and the important pathological lesions of the various respiratory diseases given in the Respiratory Module

Microbiology Lab

Lab No.	Practical title	Objectives
1	Throat swab	1. Be familiar with the selection, collection and transport of specimen for microbiological examination. 2. Be familiar with the cultivation and isolation of viable pathogens. 3. List types of media used for throat swab culture. 4. Identify and describe the type of hemolysis. 5. Explain the value of using of some biochemical reactions.
2	Sputum culture	1. Be familiar with the selection, collection, and transportation of sputum sample. 2. Be familiar with the cultivation of acid-fast and none acid-fast bacteria. 3. Be familiar with the procedure of Ziehl-Neelsen stain. 4. Be able to visualize and observe mycobacterium under the microscope. 5. Be familiar with the Lowenstein-Jensen medium. 6. Prepare slides from the sputum for staining.