COURSE PLAN

FIRST: BASIC INFORMATION

College

College : Medicine

Department : Basic Medical Sciences

Course

Course Title : Cardiovascular System

Course Code : 31500231

Credit Hours : 5

Prerequisite : None

Instructor

Name : Mohamad Al-Saghbini Course coordinator + other staff members as per subject.

Office No. : 9

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Office Hours : Sunday, Tuesday, Thursday 10-12

Class Times

Building	Day	Start Time	End Time	Room No.
Faculty of Medicine	Sunday, Monday, Tuesday Wednesday &	8:00	12:00	B 1 and B 2

	Thursday			

Text Books

ANATOMY:

1.Principles of Human Anatomy. By G.J. Tortora, Latest edition.

2.Clinical Anatomy for Medical Students. By R.S. Snell, Latest edition.

3.Basic Histology, by L. Carlos Junqueira. Latest edition.

4. Before we are born. By K.L. Moore and T.V.N. Persaud, Latest edition.

BIOCHEMISTRY:

1.Biochemistry by Campbell & Farrell ,latest edition

2.Lippincott's Illustrated Reviews "Biochemistry" , latest edition

PHYSIOLOGY:

1. Textbook of Medical Physiology, by Guyton and Hall, 10th edition, 2000.

2. Review of Medical Physiology, by William F. Ganong, 20th edition, 2001.

PATHOLOGY:

Basic Pathology, by Kumar, Cotran and Robbins, Latest edition.

PHARMACOLOGY:

Lipincott's Illustrated Reviews: Pharmacology, Latest edition.

COMMUNITY MEDICINE:

Supplementary Departmental handouts.

SECOND: PROFESSIONAL INFORMATION

COURSE DESCRIPTION

Cardiovascular Module is five credit hours course. It is designed to focus on anatomical with development & physiological character of the system. It also includes the Pathological and Biochemical changes during diseases state and explains the pharmacological treatment of the disease which includes the possible prevention of those diseases. It focus again on the community aspect of the diseases related to the CVS. Finally it concentrate on some common cardiovascular disease such as hypertension, ischemic heart disease and arrhythmias.

COURSE OBJECTIVES

Upon completion of this course students should be able to:

1. Identify the anatomy of mediastinum, heart chambers, valves, general and Topographic of the great vessels and their distribution.
2. Describe the microscopic appearance of different parts of the cardiovascular system, normal embryological development with their common congenital abnormalities.
3. Describe and understand the electrocardiogram cardiac cycle, hemodynamics, regulation of blood flow and blood pressure, microcirculations, and the mechanism of circulatory shock.
4. Understand the metabolism of the cardiac muscles and the value of the cardiac enzymes and Troponins and their role in the diagnosis of acute myocardial disease.
5. Recognize the role and types of lipoprotein disorders and the mechanism of formation of atherosclerosis.
6. Recognize the characteristics of microorganisms that cause infection of the cardiovascular system, their pathogenicity and methods of

identification.

7. Define with the more common types of cardio vascular diseases with emphasis on (etiology, mechanism, morphology and briefly to correlate the pathological aspects of diseases with clinical manifestations).
8. 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.
9. Recognize the major cardiovascular risk factors in health and diseases.
10. Identify the nutritional and dietetic components in the etiology, management, and prevention of cardiovascular diseases.

COURSE LEARNING OUTCOMES

1) Knowledge and Understanding

1. The structures of the heart including chambers, valves and coronary blood supply.
2. The nature, functions, physiologic roles of conductive system and the mechanism of excitation of the heart , the normal electrical action potential of the heart (ECG)
3. Cardiac output and cardiac cycle.
4. Hemodynamic of blood flow
5. Local blood flow to the tissues and its regulation
6. Microcirculation and its regulation
7. Regulation of blood pressure
8. Arrhythmia , hypertension, heart failure and circulatory shock.

2) Professional Skills

The student should be able to differentiate the different cardiovascular disorders.

3) Competences (Transferable skill and attributes)

The student should be able to differentiate the different investigations required for each cardiovascular disorder

C. Specific objectives

#	Lecture Title **1st week**	Lecture Objectives
1	Introductory Case Presentation for CVS Dr Jaffar	1. Understand the general outline of the CVS module. 2. Be familiar with the modalities of teaching throughout the course. 3. Acknowledge the important relation between normal and abnormal structure and function. 4. Appreciate the importance of basic sciences in clinical application.
2	Mediastinum & pericardium **(Anatomy)**	1. Describe divisions of the mediastinum. 2. Describe the outline and normal position of the heart. 3. Understand and identify relations of different parts of the heart in the middle mediastinum. 4. Identify and list various contents of the mediastinum. 5. Define the pericardium and describe its covering layers. 6. Describe its attachment to the diaphragm and the root of the great vessels. 7. Discuss the pericardial space and its recesses and pericardial fluid in normal conditions. 8. Describe innervations of the fibrous pericardium.
3	Heart chambers, valves Conductive system and	1. Describe divisions of the heart into four chambers and the internal and external features of each chamber. 2. Describe different parts of the conductive system of the heart and their arrangement and function within the

	Innervations of the heart **(Anatomy)**	myocardium. 3. Understand and describe the principle of cardiac referred pain. 4. Identify papillary muscles and describe their locations and importance. 5. Describe the atrio-ventricular valves and their position and the attachment of the cusps to papillary muscles and their functional importance. 6. Describe the aortic and pulmonary semilunar valves and their position and functional importance.
4	Organization of CVS **(Physiology)**	1. Describe the systemic and pulmonary circulations and their differences. 2. Explain the functional parts of CVS. 3. Discuss blood volumes and pressure in different parts of CVS. 4. Describe the blood velocity and flow through different parts of CVS and its relation to cross sectional area. 5. Discuss the basic functions of CVS
5	Histology of the myocardium and blood vessels **(Anatomy)**	1. Describe the microscopic structure of the cardiac muscle and the histological appearance of the intercalated discs and Purkunji fibers. 2. Describe the histological features of Endocardium, and Epicardium. 3. Describe the ultra-structure of the heart skeleton. 4. Describe the histological appearance of arteries and veins and their differences. 5. Describe the ultra-structural features of different types of capillaries.
6	Surface anatomy of the CVS **(Anatomy)**	1. Describe the surface landmarks of the heart. 2. Describe the surface anatomy of great vessels entering and leaving the heart. 3. Describe the surface markings of heart valves and ideal sites for their auscultation. 4. Describe the surface markings of Peripheral and central pulses that are commonly used for palpation.
7	Physiology of cardiac muscle **(Physiology)**	1. Discuss the cardiac conductive system and its function. 2. Describe the action potential of the cardiac muscle and its components. 3. Define the refractory period and the excitation-contraction coupling 4. Discuss the control of excitation and conduction of the heart.
8	ECG	1. Identify waves of ECG and the cause of each.

	(Physiology)	2. Define the normal intervals and segments, PR and QT interval. PR and ST segment. 3. Discuss the bipolar and unipolar leads and their locations. 4. Discuss the bipolar limb lead and the cardiac axis.
9	Cardiac arrhythmia **(Physiology)**	1. Define different ectopic foci of excitation and the mechanism of re-entry phenomena. 2. Describe different types of arrhythmia and the ECG appearance in each type. Atrial fibrillation, atrial flutter, supra ventricular tachycardia, ventricular tachycardia, and ventricular fibrillation. 3. Discuss different types of conduction block. Incomplete (first and second degree) and complete heart block.
10	Antiarrhythmic drugs I **(Pharmacology)**	1.Describe the therapeutic strategies for treatment of arrhythmia. 2.List the major classes of drugs used in the treatment of arrhythmia 3.Describe the role of Na+ channel blockers in the treatment of arrhythmia 4.Understand the Pharmacokinetics, indication, contraindication and adverse effects of commonly used Na+ channel blockers. 5.Describe the values of Beta –adrenoreceptor blockers in the treatment of arrhythmia.
11	Antiarrhythmic drugs II **(Pharmacology)**	1. Describe the values of K+ channel blockers in the treatment of arrhythmia 2. Describe the values of Ca++ channel blockers in the treatment of arrhythmia 3. Describe other antiarrhythmic drugs 4. Understand the pharmacokinetics, indication, contraindication, and adverse effects of commonly used drugs of each class.
12	Cardiac cycle **(Physiology)**	1. Identify the systolic and diastolic period. 2. Discuss the changes of pressure and volumes in left ventricle, left atrium, and the aorta during cardiac cycle 3. Explain the meaning of is volumetric contraction, period of ejection and is volumetric relaxation. 4. Discuss the volume-pressure relationship in the left ventricle. 5. Explain the development of first and second heart sounds.
13	Cardiac Output & Its regulation **(Physiology)**	1. Define the cardiac output and cardiac index. 2. Discuss the role of venous return and cardiac reserve and their effect on cardiac output. 3. Describe the role of right atrial pressure and mean circulatory filling pressure. 4. Study the effect of increased sympathetic activity and blood volume on cardiac output. 5. Study the methods for measurement of cardiac output.

14	Mechanism of heart Pumping **(Physiology)**	1. Discuss the intrinsic and extrinsic factors that affect cardiac pumping. 2. Explain the Frank-starling mechanism. 3. Describe the effect of autonomic nervous system on the heart pumping. 4. Describe the effect of K^+ and Ca^{++} on the heart function. 5. Discuss the energy and oxygen utilization of the heart.
	2nd week	
15	Metabolism in the cardiac muscle under physiological and pathological conditions **(Biochemistry)**	1. Under the major sources of energy for the cardiac muscle 2. Discuss Ketone bodies synthesis and utilization during starvation. 3. Discuss the specificity of lactate metabolism in hypoxic heart muscle. 4. Discuss the specificity of metabolism of the cardiac muscle under pathological conditions (diabetes).
16	Microbiology of cardiovascular system **(Microbiology)**	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.
17	**Microbiology of cardiovascular system** **(Microbiology)**	1. To know the different types of endocarditic. 2. To classify infective endocarditic. 3. To discuss the pathogenesis and list organisms causing endocarditic. 4. To compare acute & subacute bacterial endocarditic. 5. To list the possible complications of bacterial endocarditic. 6. To describe briefly Marantic & Libman-sack endocarditic.
19	Cardiomyopathy-Pericardium and cardiac tumors **(Pathology)**	1. To list the major etiological factors of myocarditis. 2. To briefly discuss the main features and effects of the main types of cardiomyopathies. 3. To classify pericarditis according to type of exudate. 4. To describe the pathology of the common types of heart tumors.

20	Blood vessels I-Arterial system **(Anatomy)**	1. Describe locations and branches of the ascending aorta and arch of aorta. 2. Describe locations of arteries in the region of the head and neck and their immediate relations 3. Describe locations of arteries in the region of thorax and their immediate relations. 4. Describe locations of arteries in the abdomen and pelvis with their immediate relations 5. Describe locations of branches and continuation of the subclavian artery into the upper limb and their immediate relations 6. Describe locations of branches and continuation of external and internal iliac artery into the lower limb and their immediate relations
21	Blood vessels II– Venous system **(Anatomy)**	1. Describe the Caval system (course and relations of superior and inferior vena cava). 2. Describe tributaries of the superior vena cava draining the head, neck and upper limbs. 3. Describe tributaries of the inferior vena cava draining the abdomen, pelvis and lower limbs. 4. Describe the Azygous system and its drainage area. 5. Describe the important surface landmarks of major veins from clinical point of view. 6. Discuss the principle of function of muscular venous pump and their location in the human body. 7. Describe the portal venous system. 8. Describe Cavo Caval and porto Caval anastomosis
22	Hemodynamic I **(Physiology)**	1. Study relationship between pressure, flow, and resistance. 2. Discuss laminar and turbulent blood flow. 3. Understand methods for measurement of blood flow. 4. Define blood pressure and its standard unit. 5. Discuss resistance to blood flow, peripheral and pulmonary resistance, and the effect of hematocrit on vascular resistance.
23	Hemodynamic II **(Physiology)**	1. Describe vascular dispensability and its difference in arteries and veins. 2. Study and understand Laplace law. 3. Discuss vascular compliance and delay compliance. 4. Describe arterial pressure pulsation and transmission of pressure pulses to the peripheral arteries. 5. Discuss the function of the veins, venous pressure, venous resistance, venous valve and venous pump. 6. Define the blood venous reservoir and their function
24	Blood pressure **(Physiology)**	1. Define the blood pressure during systole, diastole, and the pulse pressure. 2. Define mean arterial blood pressure, circulatory filling pressure, and central venous pressure. 3. Explain the hydrostatic effect on the blood pressure in different parts of CVS during different positions.

		4. Discuss the methods of blood pressure measurements.
25	Blood pressure regulation I **(Physiology)**	1. Discuss the mechanism of the nervous regulation (acute) of BP. 2. Explain the role of autonomic nervous system (vasoconstrictor tone) in BP regulation. 3. Describe the reflex mechanisms for maintaining normal pressure, role of baroreceptors, chemoreceptors, and low-pressure receptors. 4. Discuss the central nervous system ischemic response factor in regulating arterial pressure
26	Blood pressure regulation II **(Physiology)**	1. Discuss the long-term mechanism for regulation of blood pressure. 2. Explain the renal output curve. 3. Discuss the relationship between fluid intake and renal output and body fluid volume, autoregulation. 4. Discuss the role of renin-angiotensin system in regulation of blood pressure. 5. To discuss the role of aldosterone in blood pressure regulation
	MIDTERM EXAM 30%	
	3rd week	
27	Microcirculation **(Physiology)**	1. Describe the flow of blood to capillaries and the effect of pre- capillary sphincter. 2. Discuss the exchange of different substances between blood and interstitial fluid and factors that affect this exchange. 3. Identify the primary forces that control fluid movement through capillary membrane. 4. Discuss the formation of lymph and lymph flow. 5. Describe factors that regulate lymph flow and development of edema.
28	Blood flow to the tissue **(Physiology)**	1. Describe the local long mechanism that control blood flow to tissues, including acute and -term control. 2. Discuss the metabolic and myogenic theory for control of blood flow. 3. Discuss the changes that can develop in long-term regulation, including tissue vascularity, angiogenesis, and collateral circulation. 4. Discuss humoral regulation of blood flow, by vasoconstrictor and vasodilator agents.
29	Vasculitis (1+2)	1. To define vasculitis & list the possible causes of this condition.

+30	**(Pathology)**	2. To discuss the mechanism of vasculitis. 3. To understand the relation between ANCA and vasculitis. 4. To classify vasculitis. 5. To describe the main features of the following types of vasculitis: A- Polyarteritis nodosa. B- Wegneres granulomatosis. C- Giant cell arteritis. D- Microscopic polyangitis, E- Thromboangitis obliteranse. F- Kawasaki disease.
31	Plasma lipoproteins and cholesterol I **(Biochemistry)**	1. Discuss Cholesterol metabolism and its regulation 2. Discuss tri acylglycerol metabolism 3. Discuss the lipoprotein structural features and types. 4. Understand important laboratory tests of blood lipids and lipoproteins.
32	Plasma lipoproteins and cholesterol II **(Biochemistry)**	1. Discuss the metabolism of blood lipoproteins 2. Understand the role of blood lipids in atherosclerosis 3. Describe various types of hyperlipidemias.
33	Arteriosclerosis Atherosclerosis (I) **(Pathology)**	1. To define the term arteriosclerosis. 2. To list the three morphologic variants of arteriosclerosis. 3. To describe the main pathological features and disease associations of medial calcification, hyaline & hyperplastic arteriolosclerosis. 4. To define the term atherosclerosis. 5. To describe the gross & histological features of AS. 6. To list the complications and effects of atheromatous plaque.

		7. To know various type of embolism
34	Atherosclerosis (II) Aortic aneurysms **(Pathology)**	1. To list the risk factors associated with atherosclerosis. 2. To understand the links between atherosclerosis and hypercholesterolemia. 3. To outline the different theories proposed for the pathogenesis of AS, with special emphasis on response to injury hypothesis. 4. To recognize the precursor lesions of AS. 5. To define aneurysm and list its types. 6. To know the possible effects of thoracic & abdominal aneurysms. 7. To discuss the Pathology of syphilitic aortitis and its effects on the aorta and heart. 8. To define the term dissecting hematoma (dissecting aneurysm) 9. To discuss the etiology, mechanism and possible out come of dissecting hematoma.
35	Hypertension **(Physiology)**	1. Define hypertension. 2. Discuss the relationship between pressure, volume and peripheral resistance, and study the mechanism of development of hypertention. 3. Discuss essential hypertension and its mechanism of development. 4. Aetiology of secondary hypertension (renal artery stenosis, coarctation of aorta, kidney disease, aldosteronism and Cushing syndrome). 5. Complication of hypertension on the human body.
36	Antihypertensive drugs I **(Pharmacology)**	1. List the major groups of drugs wed in the treatment of hypertension and give an example in each group. 2. Describe the values of diuretics used in the treatment of hypertension. 3. Describe the values of centrally acting antihypertensive drugs their indications and adverse effects. 4. Describe the values of adrenoceptor agents in the treatment of hypertensive. 5. List the major indications, contraindications, pharmacokinetics, and adverse effects of commonly used adrenoceptor agents.
37	Antihypertensive drugs II **(Pharmacology)**	1. Understand the role of peripheral vasodilators in the treatment of hypertension. 2. List the most used vasodilator drugs. 3. Understand the pharmacokinetics, indications, contraindications, and adverse effects of commonly used

		vasodilators. 4. Describe the role and mechanism of action of angiotensin receptor blocking agents and give an example of these drugs their pharmacokinetics and adverse effects. 5. Describe the role of angiotensin converting enzyme inhibitors (ACEI) and give an example of commonly used drugs, their pharmacokinetics indications, contraindications and adverse effects.
38	Hyperlipidemias **(Pharmacology)**	1. Define the therapeutic strategies for the treatment of hyperlipidemia. 2. Understand the indications to use antihyperlipidemic drugs. 3. Classify the drugs used in the treatment of hyperlipedemias. 4. Understand the mechanism of action of HMG-CoA reductase inhibitors, their values, indications, contraindications, adverse effects and give an example of commonly used drugs in this group 5. Describe the mechanism of actions, clinical uses and toxicity of fabric acid derivatives. 6. Understand the role of drugs which reduces the fat absorption from GIT (ezetimibe and orlistat).
	4^{th} week	
39	Coronary circulation & venous drainage of the myocardium **(Anatomy)**	1. Describe the origin of left and right 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 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.
40	Coronary circulations **(Physiology)**	1. Explain normal coronary blood flow during systole and diastole to different parts of the myocardium. 2. Discuss the local factors for control of coronary blood flow, local metabolism as primary factor and the oxygen demand. 3. Describe the effect of autonomic nervous system on coronary arteries, role of Alpha and Beta-receptors. 4. Define ischemic heart disease, the cause of cardiac pain and the mechanism of collateral circulation. 5. Diagnosis of Coronary artery disease, angina pectoris and Myocardial infarction.

41	Ischemic heart disease (IHD) I **(Pathology)**	1. To define the term IHD. 2. To list the syndromes associated with IHD. 3. To understand the pathogenesis of IHD. 4. To correlate the type of angina pectoris with the pathology of coronary arteries. 5. To describe the pathology of myocardial infarction (MI) including: types, gross, histology and sites.
42	Ischemic heart disease (IHD) II Hypertensive heart disease (HHD) **(Pathology)**	1. To outline the main clinical features of MI. 2. To list the possible complications of MI. 3. To describe the main features of chronic ischemic heart disease. 4. To list causes of sudden cardiac death and outline the mechanism of SCD. 5. List the criteria of HHD. 6. Describe the gross and histological features of the heart in HHD.
43	Cardiac enzymes and other proteins markers **(Biochemistry)**	1. Discuss the role of cardiac enzymes CK, LDH and AST in the diagnosis of heart disease. 2. Discuss the role of myoglobin, troponin, natriuretic peptides, and D-dimmers in the diagnosis of cardiovascular disease.
44	Antianginal drugs **(Pharmacology)**	1. Define the therapeutic strategies for treatment of angina pectoris. 2. List the groups of drugs commonly used in the treatment of angina. 3. Classify and describe the pharmacokinetics of nitrates. 4. Understand the mechanism of action of nitrates and their organ- system effects. 5. Describe the clinical uses and method of administration of nitrates. 6. List the major toxic effects of nitrates and nitrites. 7. Understand the role of calcium channel blockers in the treatment of angina. 8. List the most commonly used calcium channel blockers in the treatment of angina with their pharmacokinetics, indications, contraindications and adverse effects. 9. Understand the role of Beta-blockers in the treatment of angina.
45	Exercise physiology **(Physiology)**	1. Describe the mechanism of blood flow to the skeletal muscle during rest and exercise. 2. Study the circulatory readjustment during exercise. 3. Discuss the mechanism of increasing cardiac output and arterial BP during exercise (stroke volume and HR). 4. Discuss the relationship of cardiovascular performance to the level of oxygen consumption during exercise.
46	**Epidemiology and risk**	1. Define CVD.

	factors of Cardiovascular disease (CVD) (Community Medicine)	2. Understand Mortality and morbidity distribution of the CVD 3. Appreciate the time trend of CVD disease worldwide. 4. Identify non-modifiable and modifiable CVD risk factors. 5. Describe the physical and behavioral CVD risk factors. 6. Describe the psychosocial predictors of CVD.
47	**Prevention and control of CVD (Community Medicine)**	1.Appreciate the differences between Mass strategy and High-risk strategy in Prevention and Control of CVD 2. Understand the benefits and efficiency in screening for CVD risk factors 3. Get exposed to the North Karelia Project for prevention and control of CVD
48	Varicose veins Tumors of blood vessels **(Pathology)**	1. To discuss the pathogenesis of varicose veins 2. To know the different sites where VV can occur 3. To list the sequel of VV. 4. To know 6the criteria those differentiate between benign, border line & malignant blood vessel tumors. 5. To give examples of the different types of tumors.
49	Development of The heart **(Anatomy)**	1. Discuss the primary formation and folding of the heart tube. 2. Describe the formation of different chambers of the heart. 3. Understand and describe the establishment of fetal circulation and its hemodynamics and subsequent cardiovascular changes that take place after birth. 4. Describe and understand causes of major congenital malformation incurred during these developmental stages and their clinical implications.
50	Development of the vascular system **(Anatomy)**	1. Describe the formation of dorsal aorta. 2. Describe the formation of aortic arches and their fate. 3. Revise the process of transformation of fetal into adult circulation and the major changes that occur. 4. Describe major congenital malformations incurred during these stages and their clinical implications.
51	heart failure and Circulatory shock **(Physiology)**	1. Define circulatory shock, and the difference between cardiogenic and hypovolumic shock. 2. Discuss the stages of shock; non-progressive and progressive. 3. Describe sympathetic reflex compensation in shock. 4. Discuss the effects of shock on the human body.
52	Drugs used in the	1. Understand the therapeutic strategies in congestive cardiac failure.

	treatment of heart failure **(Pharmacology)**	2. Classify and give examples of digitalis glycosides. 3. Describe the pharmacokinetics of digitalis. 4. Understand the mechanism of action and the effects of digitalis. 5. List the major toxic effects and their treatment of digitalis. 6. Describe the role of diuretics, ACE inhibitors vasodilators and B1-selective adrenoceptor agonists in the treatment of congestive cardiac failure.
53	**Congenital heart diseases** **(Anatomy)**	Describe the simple congenital cardiac anomaly as VSA, ASD, And PDA Describe the complicated congenital anomaly of the heart as: Fallot tetralogy , Tricusped atresia Transposition of great arteries
	5th week	**REVISION FOR ALL LECTURES +FINAL EXAM (THEORY +PRACTICAL 70%)**

D. Weekly Teaching activities:

a. Summary of the teaching activities in the CVS System

Department	# of Lectures	# of Practical	# of Seminars 2 (4) groups
Anatomy	**10**	**2 Anatomy** **1 Histology**	**0**
Physiology	**17**	**2 Physiology**	**0**
Biochemistry	**4**	**0**	**0**
Pathology	**9**	**2 Pathology**	**0**
Microbiology	**2**	**1 Microbiology**	**0**
Pharmacology	**7**	**0**	**0**

Public Health	**2**	**0**	**0**
Multidisciplinary	**1**	**0**	**0**
Peripheral Vascular disease	**0**	**0**	**0**
Cardiac Surgery	**1**	**0**	**0**
Total	**53**	**8**	**8**

b. Practical Laboratory Sessions

#	PRACTICLE TITLE	OBJECTIVES
1	Morphological and surface anatomy of the Heart & mediastinum. **Anatomy**	1. Describe the normal location and surface makings of the heart, its valves, and great vessels. 2. Identify the heart and its great vessels in-situ in the cadaver and in cross sections. 3. Appreciate important relations of the heart in the middle mediastinum. 4. Examine external and internal features of the heart including its pericardium in wet specimens and plastic models. 5. Describe location, subdivisions and list different parts and contents of the mediastinum. 6. Identify images of the heart and its blood supply in plain chest X-ray, angiograms, and CT scans. 7. Revise the normal developmental embryology of the heart and its great vessels and recall congenital abnormalities that may result if something goes wrong.
2	ECG **Physiology**	1. Explain the differences between Unipolar and bipolar leads. 2. To locate the position of different bipolar and unipolar leads. 3. To be familiar with ECG machine and how to record the ECG. 4. To identify different waves, intervals and segments of the ECG and the shapes and amplitude of each. 5. To understand the methods of calculation the heart rate and the cardiac axis from the recording ECG.
3	Morphological and surface anatomy of blood vessels-Arterial and venous system	1. Identify main arteries and veins and their branches in the thorax upper limb and lower limb 2. Identify main arteries and veins in the head and neck and their branches and important relations 3. Identify main arteries and veins in the abdomen and their branches and important relations 4. Study and identify the above arteries in angiograms and cross sections. 5. On the living subject locate and feel the important pulses in the above regions (common carotid, superficial

	Anatomy	temporal, subclavian and abdominal aorta axillary, brachial, radial, ulnar, femoral, popliteal, dorsal pedal and posterior tibial)
4	Pathology of the Heart-I **Pathology**	1. To recognize the gross & histological appearance of recent & old MI. 2. To see examples of morphological complications of MI. 3. To be able to recognize the pathognomonic lesion of RHD. 4. To identify the gross pathology of Rheumatic valvular lesions.
5	Histology of the Heart and blood vessels. **Histology**	1. Examine the detailed microscopic structure of the cardiac muscle 2. Examine, compare, and understand the microscopic structure of walls of different caliber blood vessels. 3. Examine and study the ultrastructure of blood capillaries and sinusoids by the aid of electron micrographs.
6	Blood pressure and heart sounds **Physiology**	1. To define the blood pressure in systole and diastole. 2. To explain the methods of measurement of blood pressure (palpation and auscultation) during systole and diastole. 3. Explain the mechanism of development of Kortkoff sounds during management of blood pressure. 4. To discuss the difference of pressure values in different parts of the body during different position. 5. To discuss the cause of heart sounds and their relation to the ECG. 6. To identify the location of different region on the chest wall to hear the maximal intensity of the component of each heart sound.
7	Pathology of the Heart-II and blood vessels **Pathology**	1. To recognize different forms of endocarditis grossly. 2. To look at the three different types of cardiomyopathies grossly. 3. To identify the more common forms of congenital heart diseases. 4. Identify the gross histology of atherosclerosis 5. Study histological features of vasculitis and common types of blood vessel tumours
8	**Microbiology Lab**	**1.** To Identify clinically significant Gram-positive bacteria including: Staphylococcus aureus, Streptococcus pyogens Streptococcus pneumonia, Enterococcus fecalis **2.** To identify clinically significant Gram-negative bacteria including: Pseudomonas aeruginosa, and E. coli. **3.** To identify clinically significant fungi including: Candida spp. and Aspergillus. **4.** To interpret the results of the cultural characteristics and Microscopic morphology.

		5. To identify the phenotypic characteristics by performing the biochemical tests including coagulase, catalase, optoc bacitracin, spore staining, Lancifeild classification, IMViC, hemolysis on blood agar, Bile esculin test, and API.

COURSE LEARNING RESOURCES

Lectures, Labs, clinical case discussion, video sessions and seminars.

ONLINE RESOURCES

{Write some useful websites related to the course and other material that help students to complete the course successfully.}
This system is taught by more than one staff. Each staff is free to give online links to the students as learning resources.

ASSESSMANT TOOLS

Write assessment tools that will be used to test student's ability to understand the course material and gain the skills and competencies stated in learning outcomes

ASSESSMENT TOOLS	%
Mid Exam (Theory)	30
Final Exam (Theory + Practicals + Clinical Cases)	70
TOTAL MARKS	100

THIRD: COURSE RULES

ATTENDANCE RULES

Attendance and participation are extremely important, and the usual University rules will apply. Attendance will be recorded for each class. Absence of 10%

will result in a first written warning. Absence of 15% of the course will result in a second warning. Absence of 15% or more will result in forfeiting the course and the student will not be permitted to attend the final examination. Should a student encounter any special circumstances (i.e. medical or personal), he/she is encouraged to discuss this with the instructor and written proof will be required to delete any absences from his/her attendance records.
Use of Mobile Devices, Laptops, etc. During Class, unexpected noises and movement automatically divert and capture people's attention, which means you are affecting everyone's learning experience if your cell phone, laptop, etc. makes noise or is visually distracting during class. For this reason, students are required to turn off their mobile devices and close their laptops during class.

GRADING SYSTEM
Example:

A + = 3 %
A- = 7 %
B+ = 10 %
B = 13 %
B- = 17 %
C+ = 17 %
C = 13 %
C- = 10 %
D+ = 6 %
D = 2 %
D-(45-49) = 2 %
Less than 45 F

*Percentages are according to the number of students who passed the exam.

REMARKS

{The instructor can add any comments and directives such as the attendance policy and topics related to ethics} .

COURSE COORDINATOR

Course Coordinator: Assistant Prof. Mohamad Al-Saghbini - Department of Basic Sciences

Signature:

Date: