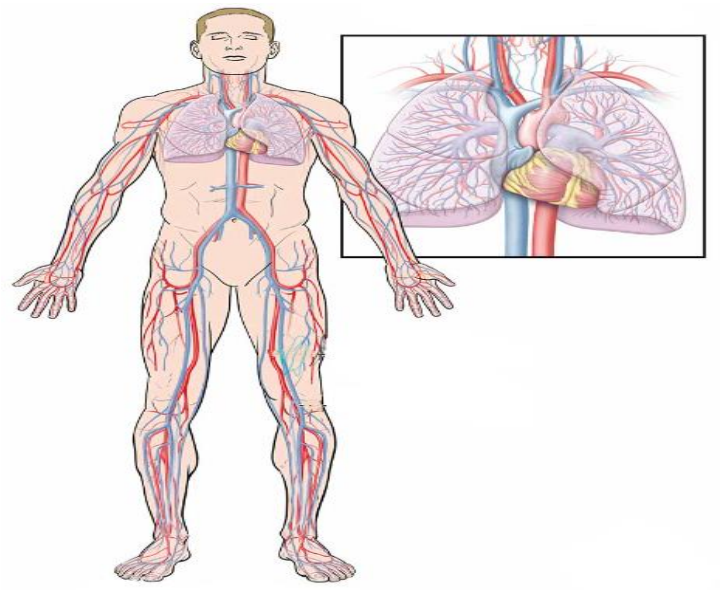
STUDY GUIDE

1ST YEAR MBBS
CARDIOVASCULAR & RESPIRATORY MODULE



LAHORE MEDICAL AND DENTAL COLLEGE

MISSION OF LMDC

The Lahore Medical and Dental College is committed in its pursuit of excellence to providing the best academic facilities and atmosphere to its students.

Our mission is to: “Train future leaders of medicine who set new standards in knowledge, care and compassion”.

The well qualified and committed faculty of LMDC provides combination of nurturing support and challenge to the students to reach their maximum potential.

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INTRODUCTION

Medical education is a life-long process and MBBS curriculum is a part of the continuum of education from pre-medical education, MBBS, proceeding to house job, and post-graduation. PMDC and UHS outlines the guiding principles for undergraduate medical curriculum and has defined the generic competencies and desired outcomes for a medical graduate to provide optimal health care, leading to better health outcomes for patients and societies.

Level of Student: 1ST Year MBBS
Duration of Block: September 2025 – December 2025

MODULE NO. 04:
CARDIOVASCULAR-1

MODULE OUTCOMES

1. Describe the normal structure of heart including development, topographical anatomy, neurovascular supply, and histology.
2. Review the arrangement of circulatory system (arteries, veins, lymphatics).
3. Define the congenital anomalies of cardiovascular system with reference to normal development and early circulation.
4. Define functions of cardiac muscle along with its properties
5. Interpret pressure changes during cardiac cycle along with regulation of cardiac pumping.
6. Interpret normal & abnormal ECG, ST-T changes, and its abnormalities.
7. Identify the risk factors and role of lipids in coronary blockage and atherosclerosis (hyperlipidemia/ dyslipidemia).
8. Define cardiac output and its modulating/controlling factors.
9. Differentiate left and right sided heart failure and correlate it with the importance of pressure differences.
10. Enumerate different types of arrhythmias and describe the electrical events that produce them.
11. Discuss the psychosocial impact of cardiovascular diseases in society.

THEMES

- Heart
- Circulation

CLINICAL RELEVANCE

- Cardiac Failure
- Arrhythmias
- Atherosclerosis and Ischemic heart diseases
- Hypertension
- Shock
- Congenital Heart diseases
- Peripheral arterial diseases

LEARNING OBJECTIVES AND COURSE CONTENT OF INDIVIDUAL SUBJECTS

NORMAL STRUCTURE			
THEORY			
CODE	GROSS ANATOMY	TOTAL HOURS = 10	
	SPECIFIC LEARNING OUTCOMES	DISCIPLINE	TOPIC
CV-A-001	Define mediastinum giving its boundaries and compartments. List the contents of its various compartments.	Human Anatomy	Mediastinum
	Describe the formation, tributaries, and termination of superior vena cava		
	Describe the formation, branches, and relations of ascending aorta, aortic arch and descending thoracic aorta.		
	Discuss the distribution of ascending aorta, aortic arch and descending thoracic aorta in reference to their branches		
	Describe formation, course and tributaries of azygous, hemizygous and accessory hemizygous veins.		
	Describe the course, relations, and distribution of vagus and thoracic splanchnic nerves in relation to nerve supply of heart.		
CV-A-002	Describe Pericardium and its parts with emphasis on their nerve supply.	Human Anatomy	Pericardium
	Describe the pericardial cavity mentioning transverse and oblique sinuses. Discuss their clinical significance		
	Describe the anatomical correlates of various pericardial conditions like pericardial rub, pericardial pain, pericarditis, pericardial effusion, and cardiac tamponade.	Integrate with Medicine	
	Describe the anatomical basis for Paracentesis /pericardiocentesis.		
	Describe the external features of heart.		Heart

CV-A-003	List various chambers of heart mentioning their salient features and openings.	Human Anatomy	
	Describe the arterial supply of heart: coronary arteries and their distribution with special emphasis on collaterals established during ischemia.		
	Describe the sites of anastomosis between right and left coronary arteries with the participating vessels.		
	Discuss the anatomical correlates of cardiac arterial supply	Integrate with cardiology/ Medicine	
	Describe the anatomical correlates of electrocardiography, cardiac referred pain.	Integrate with Cardiology/ Medicine	
	Describe the anatomical basis for angioplasty, and coronary grafts.		
	Describe the features of angina pectoris and myocardial infarction and correlate them anatomically	Human Anatomy	
	Describe the venous drainage of heart.		
	Describe the alternative venous routes to the heart		
	Identify the vessels supplying the heart with their origins/terminations.		
	Describe the formation, relations, and distribution of cardiac plexus.		
	Describe components and significance of fibrous skeleton of heart		
	Describe the cardiac valves		
	Explain the anatomical basis for valvular heart diseases	Integrate with Cardiology/ Medicine	
	Perform surface marking of various anatomical landmarks of heart and great vessels	Human Anatomy	
	Perform percussion and auscultation of heart	Integrate with Medicine	
	Identify the salient features of heart and great vessels on Computed tomography/ Magnetic Resonance Imaging CT/ MRI	Integrate with Radiology	

THEORY			
CODE	EMBRYOLOGY & POST-NATAL DEVELOPMENT	TOTAL HOURS = 14	
	SPECIFIC LEARNING OUTCOMES	DISCIPLINE	TOPIC
CV-A-004	Describe the early development of heart and blood vessels	Human Embryology	Introduction
	Describe the development of pericardial cavity	Human Embryology	
CV-A-005	Define parts of primitive heart tube and give its folding	Human Embryology	Development of Heart
	Describe the development of various chambers of heart with emphasis on their partitioning		
	Identify various parts of developing heart tube and structures derived from them during embryonic and fetal life (Models and specimens)		
CV-A-006	Describe the embryological basis of dextrocardia and ectopia cordis	Human Embryology	Development of Heart and Development of Lymphatic System
	Describe the partitioning of primordial heart: atrioventricular canal and atrium		
	Describe the development of sinus venosus		
	List clinically significant types of atrial septal defects along with their embryological basis and features. Describe probe patent foramen ovale	Integrate with Pediatrics	
	Describe the partitioning of truncus arteriosus and bulbus cordis	Human Embryology	
	Describe the formation of ventricles and interventricular septum		
	Describe the clinical features and embryological basis of ventricular septal defects	Integrate with Pediatrics	
	Describe the development of cardiac valves and conducting system.	Human Embryology	
	Describe the development of lymphatic system	Human Embryology	
CV-A-007	Describe the embryological correlates and clinical presentation of developmental defects of heart:	Integrate with Pediatrics	

	Tetralogy of Fallot, Patent ductus arteriosus, Unequal division of arterial trunks, Transposition of great vessels and Valvular stenosis, Coarctation of aorta		Development of Arteries
	Describe the formation and fate of pharyngeal arch arteries	Human Embryology	
	Describe the anomalies of great arteries emerging from heart: Coarctation of aorta, anomalous arteries	Integrate with Cardiology/ Medicine	
CV-A-008	Describe the development of embryonic veins associated with developing heart: Vitelline veins, Umbilical Veins and Common cardinal vein and their fate	Human Embryology	Development of Veins
	Describe the formation of superior & inferior vena cava and portal vein with their congenital anomalies		
	With the help of diagrams illustrate the development of superior vena cava, inferior vena cava and portal vein		
CV-A-009	List the derivatives of fetal vessels and structures: Umbilical vein, ductus venosus, umbilical artery, foramen ovale, ductus arteriosus	Human Embryology	Fetal Vessels & Circulation
	Describe Fetal and neonatal circulation mentioning transitional neonatal circulation with its clinical implication	Integrate with Pediatrics/ Obgyn	
CV-A-010	List clinically significant types of atrial septal defects along with their embryological basis and features. Describe patent foramen ovale.	Pediatrics	Congenital Heart defects
	Describe the embryological correlates and clinical presentation of developmental defects of heart: Tetralogy of Fallot, Persistent ductus arteriosus, Unequal division of arterial trunks, Transposition of great vessels and Valvular stenosis		

THEORY			
CODE	MICROSCOPIC ANATOMY (HISTOLOGY & PATHOLOGY)	TOTAL HOURS = 04	
	SPECIFIC LEARNING OBJECTIVES	DISCIPLINE	TOPIC
CV-A-011	Describe microscopic structure of Heart wall (Endocardium, Myocardium, Epicardium) Describe histology of Cardiac skeleton, SA (sinoatrial) node, AV (atrioventricular) node, Purkinje fibers. Describe the microscopic and ultramicroscopic structure of cardiac muscle emphasizing on Tubules, sarcoplasmic reticulum and intercalated discs. Identify, draw and label histological structure of cardiac muscle	Histology	Heart & Cardiac Muscle
CV-A-012	Describe general histological organization of blood vessels: Tunica intima, media and adventitia. Identify, draw and label histological sections of elastic artery, muscular artery, arterioles, vein, capillaries and sinusoids	Histology	Blood Vessels Organization
CV-A-013	Describe histological features of arteries: Muscular arteries, elastic arteries, Arterioles	Histology	Arteries
CV-A-014	Describe histological features of veins and exchange vessels: large veins, medium sized veins, venules, Capillaries, and sinusoids Compare and contrast the light microscopic structure of arteries and veins	Histology	Veins
CV-A-015	Describe the histopathological basis of thrombus and embolus formation.	Integrate with Pathology	Thrombus/ Embolus formation
CV-A-016	Explain the histological basis of arteriosclerosis and atherosclerosis. Describe role of arterioles in hypertension	Histology	Arteriosclerosis atherosclerosis Hypertension
CV-A-017	Describe histological features of Lymph vascular system (Lymph capillaries, Lymph vessels & Lymphatic duct)		Lymph vascular System

PRACTICAL

CODE	HISTOLOGY	TOTAL HOURS = 03	
	SPECIFIC LEARNING OBJECTIVES	DISCIPLINE	TOPIC
CV-A-018	Identify, draw and label histological structure of cardiac muscle	Histology	Histological features of Cardiac Muscle
CV-A-019	Identify, draw and label histological sections of elastic artery, muscular artery, arterioles, vein, capillaries and sinusoids	Histology	Histological features of Blood Vessels

NORMAL FUNCTION

THEORY

CODE	MEDICAL PHYSIOLOGY	TOTAL HOURS = 68	
	SPECIFIC LEARNING OBJECTIVES	DISCIPLINE	TOPIC
CV-P-001	Explain the physiological anatomy of cardiac muscle.	Physiology	Cardiac Muscle
	Explain the functional importance of intercalated discs.		
	Discuss the properties of cardiac muscles.		
	Describe and draw the phases of action potential of ventricle.		
	Describe and draw the phases of action potential of SA node along with explanation of the mechanism of self-excitation/ Auto rhythmicity of SA node.		
	Define and give the duration of the Absolute and relative refractory period in cardiac muscle.		
	Describe the mechanism of excitation-contraction coupling and relaxation in cardiac muscle.		
	Draw & explain pressure & volume changes of left ventricle during cardiac cycle.		
	Explain & draw relationship of ECG (Electrocardiography) with cardiac cycle.		

	Explain & draw the relationship of heart sounds with cardiac cycle.		
	Enlist, draw, and explain the physiological basis of atrial pressure waves in relation to cardiac cycle.		
	Define & give the normal values of the cardiac output, stroke volume, end diastolic volume & end systolic volume	Integrate with Medicine	
CV-P-002	Describe the Frank starling mechanism.	Physiology	Regulation of heart pumping
	Describe the autonomic regulation of heart pumping.		
	Describe the effect of potassium, calcium ions & temperature on heart function.		
	Define chronotropic effect- positive and negative.		
	Define the inotropic effect: positive and negative.		
	Define dromotropic effect: positive and negative		
	Describe the location of adrenergic & cholinergic receptors in heart.		
	Name the receptors present in coronary arterioles.		
	Explain sympathetic & parasympathetic effects on heart rate & conduction velocity		
CV-P-003	Draw and explain the conducting system of heart	Physiology	Conducting system of heart
	Describe the physiological basis and significance of AV nodal delay.		
CV-P-004	Explain the ectopic pacemaker	Integrate with Cardiology/Medicine	Fundamentals of ECG
	Enlist, draw, and explain the physiological basis & give durations of waves, intervals, and segments of normal ECG.	Physiology	
	Describe the standard limb leads, Augmented limb leads & precordial leads.		
	Define Einthoven's Triangle & Einthoven's law.		
	Explain the physiological basis of upright T wave in normal ECG.		
	Describe the location and significance of J point in ECG.		

	Explain the physiological basis of current of injury.		
	Enlist the ECG changes in angina pectoris.	Integrate with Medicine	
	Enlist the ECG changes in myocardial infarction.		
	Plot the mean cardiac axis.	Physiology	
	Enlist the physiological & pathological causes of right axis deviation of heart.		
	Enlist the physiological & pathological causes of left axis deviation of heart		
	Describe the abnormalities of T wave and their causes	Integrate with Medicine	
CV-P- 005	Describe the effect of hypokalemia and hyperkalemia on ECG	Integrate with Biochemistry	Effect of electrolyte on ECG
	Describe the effect of hypocalcemia and hypercalcemia on ECG.		
CV-P- 006	Define tachycardia and enlist its causes.	Integrate with Medicine	Cardiac arrhythmia
	Define bradycardia and enlist its causes.		
	Classify arrhythmias	Physiology	
	Explain the physiological basis of sinus arrythmia.		
	Explain the physiological basis of reflex bradycardia in Athletes.		
	Explain the carotid sinus syndrome.		
	Enlist the causes of atrioventricular block.	Integrate with Cardiology/ Medicine	
	Explain the types of atrioventricular blocks.		
	Explain the ECG changes in 1st, 2nd & 3rd degree heart block.		
	Explain the cause, physiological basis & ECG changes in Stokes Adam syndrome/ventricular escape.	Physiology	
	Enlist the causes of premature contractions.	Integrate with Cardiology/ Medicine	
	Explain the causes and ECG changes of premature atrial contractions.		
	Explain the physiological basis of pulses deficit.	Physiology	
	Explain the causes and ECG changes in Premature Ventricular Contraction (PVC)		

	Enlist the causes and ECG findings in Long QT syndrome.	Integrate with Cardiology/ Medicine	
	Explain the causes, physiological basis, features, ECG changes & management of premature heartbeat.		
	Explain the causes, physiological basis, features, ECG changes & management of atrial fibrillation.		
	Explain the causes, physiological basis, features & ECG changes of ventricular fibrillation.		
	Explain the physiological basis, features & ECG changes of atrial flutter.	Physiology	
	Compare Flutter and Fibrillations	Physiology	
CV-P-007	Explain the functional parts of circulation (arteries, arterioles, capillaries, veins, venules).	Physiology	Organization of Circulation
CV-P-008	Explain the pressures in systemic & pulmonary circulation.	Physiology	Blood flow
	Explain the types of Blood flow and significance of Reynolds number.		
CV-P-009	Describe local control of blood flow according to tissue needs.	Physiology	Local & Humoral Control of Blood flow
	Discuss humoral control of local blood flow.		
	Explain long term control of local blood flow.		
	Describe vascular control by ions and other chemical factors.		
	Name the organs in which auto regulation of blood flow occurs during changes in arterial pressure (metabolic & myogenic mechanisms).		
CV-P-010	Explain the role of autonomic nervous system for regulating the circulation.	Physiology	Nervous Regulation of circulation
	Explain the vasomotor center.		
	Explain the control of vasomotor center by higher nervous centers.		
	Explain emotional fainting/vasovagal syncope.		

	Identify vessels constituting micro-capillaries. Enumerate hydrostatic and osmotic factors that underlie starling's hypothesis for capillary function.		
CV-P-011	Explain the role of nervous system in rapid control of arterial blood pressure.	Physiology	Rapid control of arterial blood pressure
	Explain the regulation of arterial blood pressure during exercise.		
	Enlist different mechanisms for short term regulation of arterial blood pressure.		
	Explain the role of baroreceptors in regulation of arterial blood pressure.		
	Explain the role of chemoreceptors in regulation of arterial blood pressure.		
	Make a flow chart to discuss the role of Atrial volume reflexes/ Bainbridge reflex in control of blood pressure.		
	Make a flow chart to show the reflex responses to increased blood volume which increase blood pressure and atrial stretch.		
	Describe the role of CNS ischemic response in regulation of the blood pressure.		
	Explain the Cushing reflex		
	Explain the role of abdominal compression reflex to increase the arterial blood pressure.		
CV-P-012	Make a flow chart to discuss the role of renin angiotensin system for long term control of blood pressure.	Physiology	Role of kidneys in long term Regulation of Arterial Blood Pressure
	Make a flow chart to show the regulation of blood pressure in response to increase in ECF (Extra Cellular Fluid) volume.		
	Make a flow chart to show the regulation of blood pressure in response to increase in salt intake.		
CV-P-013	Define cardiac output, cardiac index & venous return with their normal values.	Integrate with Cardiology/ Medicine	Cardiac output
	Discuss the factors regulating cardiac output		

	Discuss factors regulating venous return	Physiology	
CV-P-014	Explain the regulation of skeletal muscle blood flow at rest & during exercise.	Physiology	Skeletal muscle circulation
CV-P-015	Explain the physiological anatomy of coronary circulation.	Physiology	Coronary circulation
	Explain the regulation of coronary blood flow.		
	Explain the physiological basis of angina, myocardial & subendocardial infarction		
CV-P-016	Define & enlist different types of shock.	Physiology	Circulatory shock
	Explain the causes, features, and pathophysiology of hypovolemic/hemorrhagic shock.		
	Explain the causes, features, and pathophysiology of septic shock.		
	Explain the causes, features, and pathophysiology of neurogenic shock.	Integrate with Pathology	
	Explain the causes, features, and pathophysiology of anaphylactic shock.		
	Discuss the treatment of different types of shock.	Integrate with Medicine	
	Explain the different stages of shock.	Physiology	
	Explain the mechanisms that maintain the cardiac output & arterial blood pressure in non-progressive shock.		
	Enlist different types of positive feedback mechanisms that can lead to the progression of shock.		
CV-P-017	Enlist the different types of heart sounds and explain the physiological basis of each.	Physiology	Heart sounds
	Enlist the causes of 3rd and 4th heart sounds.		
	Explain the causes & physiological basis of murmurs caused by valvular lesions.		
	Enumerate abnormal heart sounds and describe the physiological basis of each.	Integrate with Medicine	

THEORY			
CODE	MEDICAL BIOCHEMISTRY	TOTAL HOURS = 21	
	SPECIFIC LEARNING OBJECTIVES	DISCIPLINE	TOPIC
CV-B-001	Classify lipids	Biochemistry	Classification of lipids
CV-B-002	Discuss the biomedical functions & properties of lipids	Biochemistry	Functions of lipids & Properties of lipids
CV-B-003	Classify fatty acids. Discuss the role of trans saturated, saturated, poly- and mono-unsaturated fatty acids in diet on lipid profile.	Biochemistry	Classification of fatty acids
CV-B-004	Discuss lipid peroxidation and its significance	Biochemistry	
CV-B-005	Explain the biochemical and therapeutic roles of eicosanoids (prostaglandins, leukotrienes, thromboxane, and prostacyclin)	Biochemistry	Eicosanoids
CV-B-006	Discuss Lipoprotein metabolism	Biochemistry	Lipoprotein metabolism
	Discuss role of oxidized LDL in atherosclerosis	Biochemistry	
CV-B-007	Discuss the signs and symptoms of hyperlipidemia	Biochemistry	Type I to V hyperlipidemias
	Interpret data related to hyperlipidemia		
CV-B-008	Discuss the sources, biomedical importance, active states, deficiency and excess of fat-soluble vitamins: Vitamins A.D. E and K	Biochemistry	Fat soluble vitamins
CV-B-009	Discuss the sources, biomedical importance, active states, deficiency and excess of water-soluble vitamins: Vitamins B group	Biochemistry	Water soluble vitamins
CV-B-110	Discuss the sources, biomedical importance, active states, deficiency and excess of minerals and trace elements especially zinc, Mg, Na, K, I, Ca, P, Se, S, Cu	Biochemistry	Minerals and trace elements

PRACTICAL

CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 10+3=13	
		DISCIPLINE	TOPIC
CV-P-018	Record an electrocardiogram (ECG) by correct lead placement and connections. Perform auscultation of the chest to recognize normal heart sounds.	Physiology	ECG
CV-P-019	Determine the effect of posture and exercise on blood pressure by auscultatory method.		Blood Pressure
CV-P-020	Measure the blood pressure of the subject by palpatory and auscultatory methods.		Blood Pressure
CV-P-021	Examine arterial pulse to recognize normal characteristics of pulse.		Arterial Pulse
CV-P-022	Examine neck veins to determine Jugular Venous Pulse (JVP)		JVP
CV-B-011	Perform cardiac markers Creatine Kinase and Lactate Dehydrogenase (CK and LDH) Interpret lab reports based on enzymes for diseases like cardiac disorders and hyperlipidemias	Biochemistry	Performance Interpretation of Lab report

AGING

THEORY

CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 05	
		DISCIPLINE	TOPIC
CV-Ag-001	Discuss the effect of age on blood vessels with reference to hypertension	Physiology/ Geriatrics/ Medicine	Hypertension
CV-Ag-002	Discuss the risk of cardiac attack in old age and weather conditions		Cardiac Attack
CV-Ag-003	Discuss the effect of age on valvular system of the heart.		Valvular diseases
CV-Ag-004	Discuss the effect of age on neural conduction of the heart in relation to arrythmia.		Arrythmia

CV-Ag-005	Discuss the protective role of female hormone against CVS diseases in women of reproductive age group	Physiology/ Obstetrics and Gynecology	Role of female hormone on CVS disease
PATHOPHYSIOLOGY AND PHARMACOTHERAPEUTICS			
THEORY			
CODE	**SPECIFIC LEARNING OBJECTIVES**	**TOTAL HOURS = 14**	
		DISCIPLINE	**TOPIC**
CV-Pa-001	Define Inflammation Enumerate cardinal signs of inflammation Enlist types of Inflammation	Pathology	Inflammation
	Enumerate causes & outcomes of inflammation Differentiate cells of acute & chronic inflammation		
	Describe general concept of vascular & cellular events of inflammation Enumerate chemical mediators of inflammation along with their principal functions		
CV-Pa-002	Classify types of thrombosis, embolism, and infarction	Pathology/ Integrate with medicine	Atherosclerosis
	Discuss the pathophysiology of thrombosis, embolism, and infarction		
CV-Pa-003	Identify the types and causes of hypertension		Hypertension
	Discuss the clinical consequences of hypertension and atherosclerosis		
CV-Pa-004	Discuss the pathophysiology of shock		Shock
CV-Pa-005	Classify the types of heart failure		Cardiac Failure
	Identify the causes leading to heart failure		
CV-Pa-006	Identify the types of ischemic heart disease		Ischemic Heart Disease
	Discuss the pathophysiology of different types of ischemic heart disease		
CV-Pa-007	Explain the pathological causes of high & low cardiac output.		Cardiac Output

CV-Ph-001	Discuss briefly the therapeutic effect of various antihypertensive drugs.	Pharmacology	Anti-hypertensive drugs
CV-Ph-002	Discuss briefly the therapeutic effect of various antianginal drugs		Antianginal drugs
CV-Ph-003	Discuss briefly the therapeutic effect of various antiarrhythmic drugs		Antiarrhythmic mics drugs
CV-Ph-004	Discuss briefly the therapeutic effect of drugs used in cardiac failure.		Drugs for cardiac failure

PRACTICAL

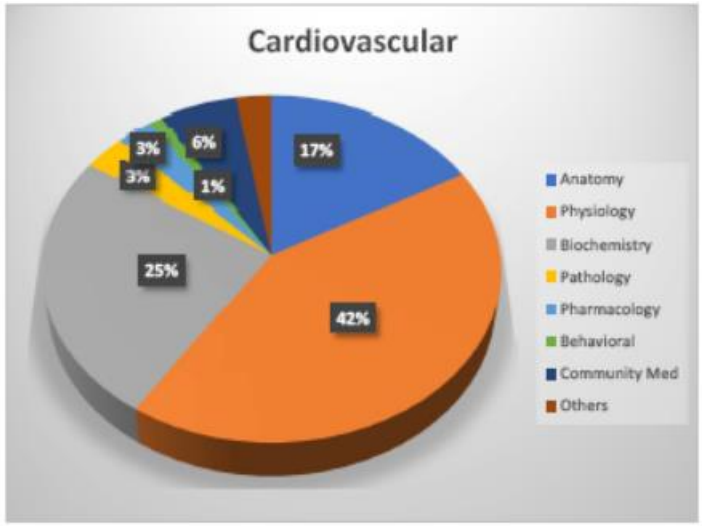
CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 01	
		DISCIPLINE	TOPIC
CV-Pa-008	Identify the pathological changes of infarction and thrombosis	Pathology	Hemodynamics

DISEASE PREVENTION AND IMPACT

THEORY

CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 11+2=13	
		DISCIPLINE	TOPIC
CV-CM-001	Describe the various strategies and models to prevent diseases.	Community Medicine and Public Health	Disease Prevention Models
CV-CM-002	Describe primordial prevention and its application to preventing CVS diseases.		Primordial Prevention
	Depict the concept of primary prevention in context to CVS and able to apply on CVS diseases.		
CV-CM-003	Discuss the basic concept of health promotion and its application to CVS.		Health Promotion
CV-CM-004	Discuss various methods of behavioural change interventions at community level.		Behavioural Change Intervention
CV-CM-005	To apply secondary and tertiary preventions on CVS diseases (coronary heart disease, ischemic heart disease, hypertension)		Secondary & Tertiary Prevention

CV-CM-006	Describe the concept of cardiovascular diseases as non-communicable diseases		Noncommunicable disease
CV-CM-007	Identify the risk factors in the community for CVS diseases.		Risk factor assessment of CVS diseases
	Learn and apply interventions to prevent the risk factors in community.		
CV-BhS-001	Identify and deal with the various psychosocial aspects of Cardiovascular conditions (such as Hypertension, Coronary artery disease, Heart failure, Arrythmias, and other cardiovascular conditions) on Individual, Family and Society.	Behavioral Sciences	Personal, Psychosocial and vocational issues
CV-BhS-002	Psychological basis of emotional fainting & its impact		Emotional fainting



Module Weeks	Recommended Minimum Hours
07	166

MODULE NO. 05:
RESPIRATORY-1

MODULE OUTCOME

At the end of this module the students will be able to:

1. Apply respiratory problems.
2. Explain the pathogenesis of respiratory diseases.
3. Enlist the main investigations relevant to respiratory disorders.
4. Recognize risk factors and preventive measures of main respiratory diseases.

THEMES

1. Rib cage
2. Thoracic vertebrae
3. Upper respiratory system
4. Lower Respiratory system

CLINICAL RELEVANCE

1. Acute Respiratory Distress Syndrome
2. Bronchial Asthma
3. Tuberculosis
4. Pneumonia

LEARNING OBJECTIVES AND COURSE CONTENT OF INDIVIDUAL SUBJECTS

NORMAL STRUCTURE			
THEORY			
CODE	GROSS ANATOMY	TOTAL HOURS = 24	
	SPECIFIC LEARNING OUTCOMES	DISCIPLINE	TOPIC
Re-A-001	Describe the anatomical features and neurovascular supply of nasal cavity	Human Anatomy	Upper Respiratory tract
	Describe the anatomical features and neurovascular supply of pharynx	Human Anatomy	
	Describe the anatomical features and neurovascular supply of larynx	Human Anatomy	
Re-A-002	Describe the anatomical features of the Trachea with its extent, relations, neurovascular supply and lymphatics.	Human Anatomy	Trachea
Re-A-003	Give the boundaries of thoracic cavity, superior and inferior thoracic apertures and list the structures contained/ traversing them.	Human Anatomy	Thoracic Cavity
	Describe the anatomical correlates of Thoracic outlet syndrome	Integrate with Surgery	
Re-A-004	Identify and differentiate the typical from atypical ribs.	Human Anatomy	Rib Cage
	Describe the anatomical features of ribs		
	Describe the anatomical correlates of supernumerary cervical rib.	Integrate with Surgery	
	Classify the articulations of the ribs.	Human Anatomy	
	Describe the anatomical features of these articulations.		
	Describe the movements with the muscles producing articulations.	Human Anatomy	
	Describe the effects of fracture to the neck of rib and give its anatomical justification	Integrate with Orthopedics	
	Describe the anatomical correlates of Flail Chest.		
Re-A-005	Describe the anatomical correlates of Thoracotomy	Integrate with Surgery	Intercostal space
	Define the attachments, relations, nerve supply and actions of intercostal muscles	Human Anatomy	
	Define an intercostal space and give details of its contents		

Re-A-006	Describe the anatomical features of typical & atypical thoracic vertebrae.	Human Anatomy	Thoracic Vertebrae
	Differentiate between typical and atypical vertebrae		
	Explain the thoracic part of the vertebral column (normal curvature, intervertebral joints & fascia of the back, blood supply, lymphatic drainage, nerve supply of back) Associated Clinical conditions -Kyphosis, Scoliosis		
Re-A-007	Describe the bony features of the sternum	Human Anatomy	Sternum
	Describe the anatomical correlates of sternal biopsy. and sternotomy	Integrate with Surgery	
	Describe the presentation of sternal fractures and correlate it anatomically	Integrate with Orthopedics	
Re-A-008	Define endo thoracic fascia	Human Anatomy	Connective tissue of Thorax
	Describe the supra-pleural membrane with its attachments.		
Re-A-009	Classify the joints of the thorax mentioning their articulations, movements with the muscle producing them.		Joints of Thorax
	Describe the mechanics of inspiration and expiration		
Re-A-010	Describe the origin, course, relations and distribution of intercostal nerves and vessels		Neurovascular supply of Thorax
	Describe the alternate routes of venous drainage in blockage of superior/ inferior vena cava		
Re-A-011	Describe the cutaneous nerve supply and dermatomes of thorax.	Integrate with Medicine	
	Give anatomical justification of the manifestations of herpes zoster infection on thoracic wall.	Human Anatomy	Cutaneous nerve supply of Thorax
	Discuss anatomical correlates of intercostal nerve block	Integrate with Medicine	
Re-A-012	Name the parts of diaphragm mentioning their attachments and neurovascular supply	Integrate with Anesthesia	Diaphragm
	Explain the role of diaphragm in respiration	Human Anatomy	

	Enumerate the diaphragmatic apertures with their vertebral levels, mentioning the structures traversing them.		
Re-A-013	Describe the pleura giving its parts, layers, neurovascular supply, and lymphatic drainage		Pleural cavity
	Describe the pleural cavity giving its recesses and the lines of pleural reflection	Human Anatomy	
	Describe the anatomical correlates of pleural pain pleurisy, pneumothorax, pleural effusion		
	Describe the anatomical features, relations of lungs	Integrate with Medicine	
Re-A-014	Describe the neurovascular supply and lymphatic drainage of lungs.	Human Anatomy	Lungs
	Compare and contrast the anatomical features and relations of right and left lung		
	Describe the root of the lung and pulmonary ligament with arrangement of structures at the hilum		
	Define Bronchopulmonary segments. Give their vascular supply, lymphatic drainage and clinical significance		
	Describe the anatomical correlates of chest tube intubation	Integrate with Surgery	
	Describe the anatomical correlates of thoracentesis		
	Describe the anatomical correlates of bronchoscopy	Integrate with Pulmonology	
	Describe the anatomical basis for medicolegal significance of lungs in determining the viability of newborn	Integrate with Forensic Medicine	
	Identify various anatomical landmarks on chest X-Rays, CT and MRI	Integrate with Radiology	

THEORY			
CODE	EMBRYOLOGY & POST-NATAL DEVELOPMENT	TOTAL HOURS = 05	
	SPECIFIC LEARNING OUTCOMES	DISCIPLINE	TOPIC
Re-A-015	Describe the development of ribs, sternum, and thoracic vertebrae. Give the associated congenital malformations	Human Embryology	Bony components of Thoracic cavity
Re-A-016	List the factors contributing to the development of Axial skeletal system		Development of Axial skeleton
	Describe the clinical picture and explain the embryological basis of Axial skeletal anomalies		
	Describe the developmental process of Vertebral Column		
Re-A-017	List the embryological sources of the diaphragm. Describe the events taking place in the development and descent of the diaphragm	Human Embryology	Diaphragm & Thoracic cavity
	Describe the development of Thoracic cavities (Pleural and Pericardial cavities)	Integrate with Pediatrics	
Re-A-018	Describe the development of upper respiratory tract: larynx and trachea	Human Embryology	Upper Respiratory Tract
	Describe congenital anomalies of Trachea-Tracheoesophageal fistulas of different types	Integrate with Pediatrics	
Re-A-019	List the phases of lung development with their time periods. Describe the events taking place in each phase	Human Embryology	Lungs
	Describe the embryological basis of respiratory distress syndrome/Hyaline membrane disease, Ectopic Lung lobes, Congenital cysts of Lung	Integrate with Pediatrics	

THEORY			
CODE	MICROSCOPIC STRUCTURE	TOTAL HOURS = 04	
	SPECIFIC LEARNING OUTCOMES	DISCIPLINE	TOPIC
Re-A-020	Give the general histological organization of respiratory system.	Histology	Organization of respiratory system
Re-A-021	Describe the microscopic features of respiratory epithelium & Olfactory epithelium	Histology	Respiratory epithelium

Re-A-022	Describe histology of Nasopharynx	Histology	Nasopharynx
Re-A-023	Describe the histological features of epiglottis and larynx	Histology	Epiglottis & larynx
Re-A-024	Describe the histological features of trachea and lungs Describe histology of blood-air barrier	Histology	Trachea & lungs blood-air barrier
Re-A-025	Explain the histological basis of: 1. Laryngitis 2. Singer's nodules 3. Emphysema 4. Pneumonia 5. Atelectasis 6. Infant respiratory distress syndrome	Integrate with Pathology	Clinical correlates

PRACTICAL

CODE	HISTOLOGY	TOTAL HOURS = 05	
	SPECIFIC LEARNING OBJECTIVES	DISCIPLINE	TOPIC
Re-A-026	Identify, draw and label the histologic sections of epiglottis and larynx.	Histology	Epiglottis& Larynx
Re-A-027	Describe the histological features of bronchial tree: trachea, bronchi, bronchioles, alveoli		Trachea & Organization of Respiratory System
Re-A-028	Identify, draw and label the histological sections of bronchial tree: trachea, bronchi, bronchioles, alveoli, Lung		Bronchial tree & Lung
	Describe the mucosal changes encountered in the trachea-bronchial tree		
	Compare and contrast the histological features of various components of bronchial tree: trachea, bronchi, bronchioles, alveoli.		
Re-A-029	Describe, compare and contrast the light and electron microscopic features of type I and type II pneumocytes		Pneumocytes

NORMAL FUNCTION			
THEORY			
CODE	MEDICAL PHYSIOLOGY	TOTAL HOURS = 45	
	SPECIFIC LEARNING OBJECTIVES	DISCIPLINE	TOPIC
Re-P-001	Enlist the muscles of inspiration and expiration in quiet breathing	Integrate with Anatomy	Breathing
	Enlist the muscles of inspiration and expiration in labored breathing		
	Explain the components of the work of breathing	Medical Physiology	
	Discuss the mechanics of pulmonary ventilation		
	Explain periodic breathing		
	Explain the causes and pathophysiology of sleep apnea	Integrate with medicine	
Re-P-002	Define and explain lung compliance	Medical Physiology	Lung Compliance
	Enlist the factors that affect lung compliance		
	Draw the compliance diagram of air filled and saline filled lungs		
	Enlist the components of surfactant		
	Describe the role of surfactant in lung compliance		
	Explain the role of surfactant in premature babies	Integrate with Pediatrics	
Re-P-003	Define the different lung volumes and capacities and their clinical significance	Medical Physiology	Lung volumes and Capacities
	Discuss Forced Expiratory Volume 1/ Forced Vital Capacity (FEV1/FVC) ratio and its clinical significance		
	Enlist the lung volumes and capacities that cannot be measured by spirometer.		
	Define dead space & explain its types		
	Discuss FEV1/FVC ratio in relation to Bronchial Asthma.	Integrate with Pulmonology	
	Discuss FEV1/FVC ratio in relation to Chronic Obstructive Pulmonary disease/restrictive lung diseases		

	Discuss Forced Expiratory Volume 1/ Forced Vital Capacity (FEV1/FVC) ratio in relation to pulmonary embolism	Integrate with medicine	
Re-P-004	Define alveolar ventilation.	Medical Physiology	Pulmonary ventilation
	Define minute respiratory volume		
	Describe the pressures in the pulmonary system.		
Re-P-005	Describe the blood volume of the Lungs	Medical Physiology	Pulmonary Circulation
	Describe the distribution and regulation of blood flow through the lungs.		
	Describe the mechanics of blood flow in the three blood flow zones of the lung		
	Describe the effect of heavy exercise on pulmonary arterial pressure.		
	Describe the function of pulmonary circulation when left atrial pressure rises as a result of left-sided heart failure.		
	Explain pulmonary capillary dynamics.		
Re-P-006	Discuss pathophysiology and common causes of pulmonary edema		Pulmonary Edema, and Pleural Fluid
	Explain the safety factors that prevent pulmonary edema.		
	Explain the physiological basis of the presence of fluid normally in the pleural cavity.		
	Define pleural effusion and give its causes.		
Re-P-007	Explain the ultrastructure of respiratory membrane	Medical Physiology	Principles of Gaseous Exchange
	Discuss the factors affecting diffusion of gases across the respiratory membrane		
	Explain the diffusion capacity of respiratory membrane for oxygen and carbon dioxide		
	Define alveolar, pleural and transpulmonary pressure.		
	Explain differences in the partial pressures of atmospheric, humidified, alveolar air and explain physiological basis of change in each pressure		
Re-P-008	Explain the different forms of transport of oxygen in the blood	Medical Physiology	Transport of oxygen in the blood

Re-P-009	Draw and explain oxyhemoglobin dissociation curve		oxyhemoglobin dissociation curve
	Enlist the factors that cause the rightward shift of oxyhemoglobin dissociation curve		
	Enlist the factors that cause the leftward shift of oxyhemoglobin dissociation curve		
	Explain the Bohr`s effect		Bohr`s effect
	Define, enlist the types and causes of cyanosis	Integrate with Medicine	Cyanosis
Re-P-010	Enlist different forms in which Carbon dioxide CO_2 is transported in the blood	Medical Physiology	Transport of CO_2 in blood
	Explain carboxyhemoglobin dissociation curve		
	Explain the Haldane effect		
	Explain the chloride shift/Hamburger phenomenon		
	Define the respiratory exchange ratio (RER)		
Re-P-011	Explain the alveolar oxygen and carbon dioxide pressure when Pulmonary ventilation (V) and Perfusion (Q), VA/Q= infinity, zero, and normal	Medical Physiology	VA/Q (ventilation perfusion ratio)
	Explain the concept of physiological shunt when VA/Q ratio is above normal		
	Explain the concept of physiological dead space when VA/Q ratio is above normal		
Re-P-012	Enlist the respiratory and non-respiratory functions of the lung	Medical Physiology	Protective reflexes
	Explain the nervous control of bronchiolar musculature		
	Trace the reflex arc of cough reflex and sneeze reflex		
Re-P-013	Explain the principle means by which acclimatization occurs	Medical Physiology	Aviation and space
	Explain the events that occur during acute mountain sickness		
	Enlist the features of chronic mountain sickness		
Re-P-014	Explain the pathophysiology, features, prevention and treatment of decompression sickness.	Medical Physiology	Deep sea diving
Re-P-015	Draw and explain the effect of CO poisoning on oxyhemoglobin dissociation curve	Medical Physiology	

	Explain the pathophysiology, features, and treatment of CO poisoning.	Integrate with Medicine	Carbon monoxide poisoning
Re-P-016	Enumerate the components of respiratory centers and explain their functions.	Medical Physiology	Nervous regulation of respiration
	Explain the inspiratory RAMP signal		
	Explain the Herring Breuer reflex/lung inflation reflex and its clinical significance		
Re-P-017	Explain the location of chemo sensitive area (central chemoreceptors) and peripheral chemoreceptors	Medical Physiology	Chemical control of respiration
	Explain the effect of hydrogen ions & carbon dioxide on the chemo- sensitive area		
	Explain the role of oxygen in the control of respiration/peripheral chemoreceptors		
Re-P-018	Explain the regulation of Respiration during Exercise	Medical Physiology	Exercise and Respiration
Re-P-019	Enlist the effects of acute hypoxia	Medical Physiology	Hypoxia
	Explain the hypoxia inducible factor a master switch for body response to hypoxia		
	Define and explain different types of hypoxias	Integrate with Medicine	
Re-P-020	Explain the etiology and microbial characteristics of Tuberculosis.	Integrate with microbiology	Tuberculosis
Re-P-021	Discuss the bacteria and viruses that cause Pneumonia	Integrate with microbiology	Pneumonia
Re-P-022	Define Dyspnea	General Medicine	Dyspnea
	Enlist different causes of dyspnea		
	Differentiate between cardiac and respiratory dyspnea		
	Outline management strategies for dyspnea		
Re-P-023	Enlist the causes of Pneumothorax	Integration with Surgery	Pneumothorax
	Describe the signs and symptoms of Pneumothorax		
Re-P-024	Enlist the causes of Pleuritis		Pleuritis
	Describe the signs and symptoms of Pleuritis		
	Discuss the management of Pleuritis		
Re-P-025	Enlist the causes of Bronchitis		Bronchitis

	Discuss the signs and symptoms of Bronchitis	Integration with General Medicine	
	Discuss the management of Bronchitis		
Re-P-026	Classify different types of pneumonia		Pneumonia
	Discuss the sign symptoms of pneumonia		
	Discuss the management of pneumonia		
Re-P-027	Classify different types of asthma		Asthma
	Discuss the signs and symptoms of asthma		
	Discuss the management of asthma		
Re-P-028	Classify different types of Tuberculosis		Tuberculosis
	Discuss the signs and symptoms of tuberculosis		
	Discuss the management of Tuberculosis		
Re-P-029	Classify different types of acute respiratory distress syndrome	Integration with General Medicine	Acute respiratory distress syndrome
	Discuss the signs and symptoms of acute respiratory distress syndrome		
	Discuss the management of acute respiratory distress syndrome		
Re-P-030	Define respiratory failure	Integration with General Medicine	Respiratory Failure
	Describe various types of respiratory failure		
	Enlist various causes of respiratory failure		
	Outline management strategies of respiratory failure		
Re-P-031	Describe ABC in a trauma patient	Integration with Surgery	First Aid in Surgical Patients
THEORY			
CODE	**MEDICAL BIOCHEMISTRY**	**TOTAL HOURS = 14**	
	SPECIFIC LEARNING OBJECTIVES	**DISCIPLINE**	**TOPIC**
Re-B-001	Explain and interpret the pedigree of single gene defect i.e., Emphysema and cystic fibrosis (autosomal recessive)	Medical Biochemistry	Genetic defects
Re-B-002	Describe the biochemical basis of emphysema, Chronic obstructive pulmonary disease (COPD) and cystic fibrosis	Medical Biochemistry	Respiratory diseases
	Interpret Respiratory Distress syndrome on the basis of given data	Integrate with Physiology	

Re-B-003	Describe ionization of water and elaborate its significance. Discuss water and electrolyte balance in health and disease.	Biochemistry	Water, pH, Buffers/ Ionization of water
Re-B-004	Define pH and describe the concept of pH scale.		Water, pH, Buffers/ pH and pH scale
Re-B-005	Define weak acids and conjugate base.		Water, pH, Buffers/ weak acids and their significance
Re-B-006	Define Ka and pKa and give their significance.		Water, pH, Buffers/ Ka And pKa
Re-B-007	Describe Henderson-Hasselbach (HH) equation. (no derivation required) along with its application/use. Interpret the titration curve for amino acids (alanine, histidine& acetic acid)		Water, pH, Buffers/ HH equation and its applications
Re-B-008	Define buffers. Enumerate the component of a buffers system and describe their mechanism of action. Enlist important buffers present in blood, plasma, ECF (Extra Cellular Fluid), ICF (Intra Cellular Fluid) and renal tubular fluid. Elaborate the working of bicarbonate buffer and phosphate buffer.		Water, pH, Buffers/ HH equation and its applications
Re-B-009	Elaborate the role of kidneys in the regulation of acid base balance.		Acid Base balance and imbalance/ Renal mechanisms for pH regulation
Re-B-010	Elaborate the concept of 1st, 2nd and 3rd line of defense against changes in H^+ ion concentration.	Biochemistry	Acid Base balance and imbalance/ Defense mechanisms against changes in H+ concentration

Re-B-011	Discuss the concept of acid base balance	Medical Biochemistry	Acid base balance

PRACTICAL

CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 10	
		DISCIPLINE	TOPIC
Re-P-039	Perform the clinical examination of chest for the respiratory system (inspection, palpation, percussion, Auscultation)	Medical Physiology	Clinical Examination of Chest
Re-P-040	Determine lung volumes and capacities with spirometer		Peak Expiratory Flow rate measurement
Re-P-041	Determine Blood Oxygen Saturation with finger Pulse Oximeter		Oxygen Saturation
Re-P-044	Perform Cardio pulmonary Resuscitation (CPR) on adult and infant.		CPR
Re-B-012	Determine the pH of the solution by pH meter	Medical Biochemistry	Determination of pH
Re-B-013	Interpret metabolic and respiratory disorders of acid base balance on the basis of sign, symptoms and ABG findings	Biochemistry	Acid base balance Interpretations

PATHOPHYSIOLOGY AND PHARMACOTHERAPEUTICS			
THEORY			
CODE	**SPECIFIC LEARNING OBJECTIVES**	**TOTAL HOURS = 5+3=08**	
		DISCIPLINE	**TOPIC**
Re-Ph-001	Identify the drugs for cough suppression & expectoration	Pharmacology & Therapeutics	Cough Suppressants
	Explain the mechanism of action and adverse effects of cough suppressants		
Re-Ph-002	Explain the mechanism of action and adverse effects of anti-histamines		Antihistamines
Re-Ph-003	Explain the mechanism of action and adverse effects of anti-asthmatics		Anti asthmatics
Re-Pa-001	Describe the pathophysiology of acute respiratory distress syndrome	Pathology	Acute Respiratory Distress Syndrome
Re-Pa-002	Describe the pathophysiology of obstructive lung disease		Obstructive lung Disease
Re-Pa-003	Describe the pathophysiology of Restrictive Lung Disease		Restrictive Lung Disease

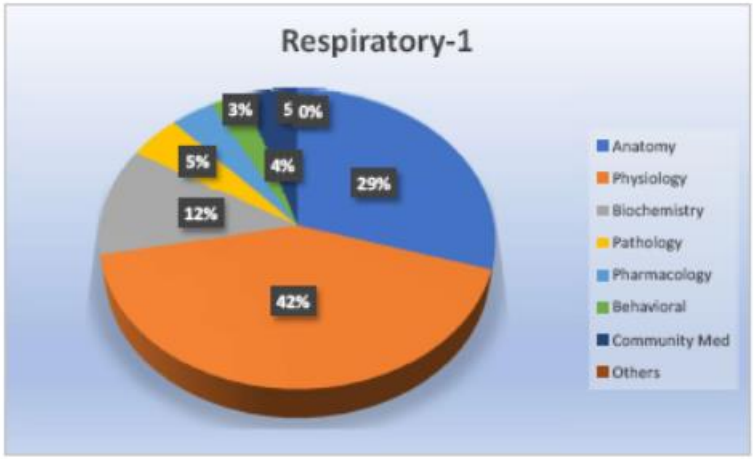
DISEASE PREVENTION & IMPACT			
THEORY			
CODE	**SPECIFIC LEARNING OBJECTIVES**	**TOTAL HOURS = 10**	
		DISCIPLINE	**TOPIC**
Re-CM-001	Identify the common risk factors of acute respiratory infections with emphasis on smoking	Community Medicine and Public Health	Prevention of acute Respiratory Infections (ARI)
	Discuss preventive strategies of different problems related to respiratory system		
	Enlist the common vaccines used for the prevention of ARI		
	Explain the role of vitamins in the respiratory tract infections	Integrate with Biochemistry	
Re-CM-002	Explain the effect of air pollutants on the respiratory system		Interaction of environment & Respiratory System

Re-CM-003	Describe the burden of respiratory diseases	Community Medicine and Public Health	Epidemiology of respiratory Diseases
Re-CM-004	Enlist the common respiratory diseases related to occupation		Occupational Lung Diseases
Re-BhS-001	identify the psychosocial factors leading to dyspnea.	Behavioral Sciences	Dyspnea
Re-BhS-002	Identify the psychosocial factors leading to psychogenic cough.		Psychogenic Cough
Re-BhS-003	Identify and deal with the various psychosocial aspects of Respiratory conditions (such as Asthma, COPD, Tuberculosis, Cystic Fibrosis, Sleep Apnea) on Individual, Family and Society.		Personal, Psychosocial and vocational issues

AGING

THEORY

CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 03	
		DISCIPLINE	TOPIC
Re-Ag-001	Discuss the microbiological basis of respiratory infections in old age in cold weather	Microbiology	Respiratory infections in old age
Re-Ag-002	Discuss the role of age on respiratory clearance leading to recurrent inflammatory processes at the ciliated respiratory epithelium	Pathology	Increased vulnerability to infection & neoplasia
	Describe the biochemical basis of emphysema, COPD and cystic fibrosis	Pathology	Respiratory diseases



Module Weeks	Recommended Minimum Hours
04	128

CURRICULUM
OF
THE HOLY QURAN

Study Guide, Department of Physiology, 2025

Quran: Year-1

SECTION ONE: FAITH (AQAID)
LEARNING OUTCOMES
a. Oneness of Allah (SWT) (Tawheed) i. Describe Unity of Allah in being ii. Describe Unity of Allah in attributes iii. Describe concept of Shirk iv. Impact of Tawheed in human life **b. Prophethood (Risalat)** i. Explain Significance of Risalat ii. Identify Prophets as role models iii. Recognize finality of Prophethood - Prophet Muhammad (PBUH) **c. Belief in Hereafter (Aakhirat)** i. Appraise continuity of life beyond material world ii. Concept of Doomsday and its various stages iii. Concept of Day of Judgment and accountability in the Hereafter iv. Concept of "Meezan" **d. Divine Revelations (Holy Books)** i. Explain the divine decree in sending the Holy Books ii. Identify the Holy Quran as the only preserved & authenticated divine revelation to date iii. Interpret Quran as Furqan **e. Angels** i. Discuss belief in angels and its significance ii. Describe the universal role of angels (their specific duties) **f. Qadr** i. Identify Taqdeer as Knowledge of Allah ii. Explain the concept of Faith in Good and Evil
CONTENTS
1. Oneness of Allah subhan wa taala (Tawheed) 2. Prophethood (Risalat)
3. Belief in Hereafter (Akhirat) 4. Devine revelations (Holy Books)

SECTION TWO: WORSHIP (IBADAAT)
LEARNING OUTCOMES
a. Prayer (Namaz) i. Recognize the importance of physical purity (Taharah) ii. Discuss the philosophy of prayer and its role in purification of soul iii. Recognize the importance of prayer in building personal character - sense of duty, patience, perseverance, punctuality and self/social discipline iv. Spiritual, moral and social impact of prayer in building of righteous community v. Role in creating brotherhood, equality and unity in ummah vi. Identify the conditions in which relaxation in prayer is allowed e.g. during operation, travelling etc. **b.Obligatory Charity (Zakat)** i. Identify obligatory importance of Zakat and other items as outlined under the title of 'Infaq-fee-sabilillah' ii. Categorize the people who can be the beneficiaries of Zakat iii. Role of zakat in eradication of greed and love of material world iv. Effect of Zakat and sadaqat in circulation of wealth and alleviation of poverty v. Explain the essence of zakat and sadaqat in building just communities vi. Describe the role of state in collection and disbursement of zakat **c.Fasting (Roza)** i. Discuss the importance and significance of fasting ii. Relate the Holy Quran and the month of Ramadan iii. Role of fasting in building personal qualities like self-control, piety and soft corner for the poor and needy persons iv. Identify the applications of "Taqwa" through fasting **d. Pilgrimage (Hajj)** i. Discuss the importance and significance of Hajj ii. Identify the conditions in which Hajj becomes an obligation iii. Role of manasik-e-Hajj in producing discipline and complete submission iv. Recognize the importance of Hajj in uniting the ummah v. Sacrifice for Allah subhan wa taala (essence of qurbani)

TOPIC AREAS
1. Prayer (Salah/Namaz) 2. Obligatory charity (Zakat) 3. Fasting (Saum/Roza) 4. Pilgrimage (Hajj)

CURRICULUM
OF
ISLAMIYAT & PAKISTAN
STUDIES

ISLAMIYAT

A short course on Islamic Studies will be completed in First and Second year with an exam at the end of second year.
Course Content:

- Understand the basic principles of Islam.
- Explain the concept of the Islamic state.
- Explain the Quran as a guide for modern society and scientific development.
- Describe the life of the Holy Prophet Peace be upon him as an example to follow.
- Explain ethics in the Islamic prospective.
- Describe the rights of the individual in Islam.
- Describe the rights of women and children in Islam.
- Explain the contribution of Islamic scholars to science and medicine.
- Understand Islam in terms of modern scientific development.
- Explain the concept of Rizk-e-Hilal.
- Explain the concept of Hukook-ul-Ibad.

PAKISTAN STUDIES

A short course on Pakistan Studies will be completed in First and Second year with an exam at the end of second year.
Course Content:

- Describe brief the salient features of the Pakistan movement.
- Explain the basis for the creation of Pakistan.
- Give a brief account of the history of Pakistan.
- Explain the ethnic and cultural distribution of the population of Pakistan.
- Describe the Provinces and resources available in Pakistan.
- Explain current problems faced by Pakistan.
- Describe the social, economic and health problems of the rural population of Pakistan

ISLAMIYAT AND PAKISTAN STUDIES BOOKS

- Standard Islamiyat (Compulsory) for B.A, B.Sc., M.A, M.Sc., MBBS by Prof. M.Sharif
- Islahi Ilmi Islamiyat (Compulsory) for B.A. B.Sc., & equivalent.
- Pakistan studies (Compulsory) for B.A. B.Sc., B.Com., Medical/Engineering by Prof. Shah Jahan Kahlun
- Pakistan studies (Compulsory) for B.A, B.Sc., B.Com., B.Ed., Medical/Engineering by Prof. Shah Jahan Kahlun

CURRICULUM

OF

CIVICS

MBBS YEAR I CURRICULUM

1. MODULE RATIONALE

Civics is part and parcel of life and the study of Civics has major thrust on improvement of the quality of life and welfare of human beings. This discipline enhances the approach towards rational behavior and daily life.

There is a need for us to know role of a citizen with specific reference to Global Village, the Citizen and Daily life issues, Citizenship, Rights and Responsibility, Role of Government and State, Implementation

Issues of Devolution plan, Social Welfare Institutions/ NGOs and their role at basic level, social interactions and the new discoveries in IT and mass media, relations with International Organizations and Pakistan and its neighbors. Civics goes beyond the cognitive level to deal with social values and attitudes. From the earliest stages of the course, it is important to respect students' opinions while helping them to develop a rationale for their opinions. This curriculum is adapted from Agha Khan University Examination Board curriculum for higher secondary examination.

2. VISION & MISSION

2.1: Vision: Building the personality and character of health professionals

2.2: Mission: Teaching Civics to undergraduate students of Health Sciences, building their personality and character, enabling them to apply these principles in patient care.

3. CURRICULUM DESIGN AND ORGANIZATION

3.1: Course Aim:

- To develop understanding of the social nature and significance of civics, its key concepts and civic life.
- To emphasize learning of related themes in a way that encourages creativity, curiosity, observation, exploration and questioning.
- To create awareness of the nature of civic life and the relationship between civics and other social sciences.
- To promote understanding about the ideology of Pakistan and the struggle of an independent state.

- To inculcate the behavior patterns of national character, and qualities of a good citizen,
- self-reliance, patriotism and leadership.
- To create a strong sense of national unity, integration and cohesion.
- To prepare students as future citizens, conscious of their positive role in a society and the world at large.

3.2: Mode of Delivery: The module will be taught in the form of interactive lectures.

3.3: Learning Experience: Classroom environment will be used.

3.4: Attendance: Seventy-five percent (75%) attendance is mandatory to be eligible to sit in the professional examination.

3.5: Assessment: The assessment will be done through two written assignments and two quizzes per year. The assignments will be based on the topics discussed during the year. One will be given after first half of the course will be completed for the year and second will be given at the completion of the course.

3.7: Module Faculty: At least one full time faculty member (Lecturer or above) will be hired to run the civics course throughout four years. The qualifications of the faculty member will be certified by the academic council of the college/institution to be declared as the teacher of civics.

LEARNING OUTCOMES	TOPICS
i. Define civics ii. Describe how civics can improve the citizenship iii. Illustrate the scope of civics iv. Discuss the nature of civics v. Give examples how civics can help in the national development	Civics-Meaning & Nature
i. Examine the significance of civics ii. Explain how civics is important to know the problems of daily life iii. Discuss how civics can help to bring improvements in the civics life of citizens iv. Evaluate how civics can improve the sense of love and respect for human relationship v. Discuss that studying civics can develop a sense of gratitude vi. Give examples how civics is important to develop the global unity	Significance and Utility
i. Compare civics with political science, history, economics, sociology and ethics	Relationship with Social Sciences
i. Describe the term harmonic relationship ii. Explain the harmonic relationship among different members of society. (Women, children and senior citizens) iii. Explain how harmonic relationship develop for respect of religion	Harmonic Relationship
i. Define the term individual in relation to civics ii. Define the term state iii. Explain the relation between an individual and a state iv. Describe the importance of an individual in a state v. Enlist the responsibilities of an individual in a state	Individual and state
i. Identify the basic unit of social institution Discuss and characterize the different types of family ii. Give the importance of basic unit of social institution in the development of a state Enlist the responsibilities of family in	Family

general iii. Analyze your role for the betterment of the family Compare and contrast the impact of the deterioration of family in the western society and give examples	
i. Define community ii. Explain the nature and significance of community iii. Discuss the role of a family in community iv. Analyze the role of an individual for the betterment of the community	Community
i. Define society ii. Elaborate the relation between an individual and society and society and state iii. Analyze the role of an individual for the betterment of society	Society
i. Define the term nation, nationality and ummah differentiate between nation and nationality distinguish between nation and ummah analyze the value, behavior and the pattern of society based on religions ii. Evaluate the characteristics of society developed by religions	Nation, Nationality
i. Trace the origin of state with reference to the theories of Divine Origin, Force and Social ii. Contract (Hobbs, Lock, Rousseau) iii. Describe the elements of a state (sovereignty, population, territory, Government) iv. Compare and distinguish the role of state, society and government	Origin and elements of State
i. Describe the functions of state ii. Describe the factors which are necessary for proper functioning of state iii. Analyze the situation when a state does not function properly iv. Describe the characteristics of a welfare state Analyze how a welfare state guarantees the equity and justice on the issues of gender, religion, and social classes	Functions of state. (Defense, law and order, welfare etc.)

i. Define the concept of sovereignty in west ii. Discuss different kinds of sovereignty iii. Explain Austin's concept of sovereignty iv. Analyze critically Austin's concept of sovereignty	Sovereignty


PERLs
PROFESSIONALISM, ETHICS
RESEARCH, LEADERSHIP SKILLS

BLOCK-3

Code	Domain	Attribute	Specific Learning Outcome	Topic	Portfolio Entry
PERLs-1-17	Professionalism	communicator	Developing an argument	Structure of an argument Validity of an argument	Write an argument
PERLs-1-18	Leadership	Resilient and Adaptable	Demonstrate patience and tolerance	Tolerance Patience Role of emotional regulation effective Giving feedback	Teacher Feedback
PERLs-1-19			Demonstrate healthy coping mechanisms to respond to stress	Stress Coping mechanisms	Self or Peer Evaluation
PERLs-1-20		Self-Directed Learner	Identify and seek help as and when required to achieve the set goals	Seeking help Right way to ask Right way to give gratitude Receiving feedback	A narrative of seeking help from a knowledgeable other in personal or professional life

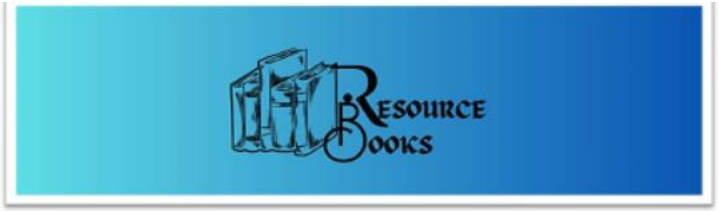
C-FRC-1
(YEAR-1)

CARDIOVASCULAR-1 MODULE		
Objectives	**Skill**	**Miller's Pyramid Level Reflected**
Auscultation of heart sounds	Heart sounds	Shows
Detection of ankle swelling/edema – pitting /non-pitting	Edema	Shows
Abdominal jugular reflex	JVP	Shows
Perform detection of pedal and carotid pulses	Pedal and carotid pulse	Shows
Perform cervical and axillary lymph node examination	Lymph node Examination	Shows

RESPIRATORY-1 MODULE		
Objectives	**Skill**	**Miller's Pyramid Level Reflected**
Performance of chest compressions	CPR/Chest compressions	Shows
Detection of clubbing	Clubbing	Shows
Identify main organs of the thorax on CXR	CXR	Shows
Identification of pneumonic patch on chest x ray	Pneumonia CXR	Shows
Administering inhaler to a patient	Inhaler use	Shows

TEACHING AND LEARNING METHODOLOGIES

- Large Group Interactive Session
- Problem Based Learning (PBL)
- Tutorials
- Skill Laboratories
- Laboratory Practical
- Demonstrations
- Self-Directed Learning



Anatomy

- Snell's Clinical Anatomy 10th ed.
- Langman's Medical Embryology 12th ed
- Medical Histology by Laiq Hussain Siddiqui 8th ed.
- General Anatomy by Laiq Hussain Siddiqui 8th ed.

Physiology

- Guyton AC and Hall JE. Textbook of Medical Physiology. W. B. Sunders & Co., Philadelphia 14th Edition.
- Essentials of Medical Physiology by Mushtaq Ahmed

Biochemistry

- Harpers illustrated Biochemistry 32nd edition. Rodwell.V.W MCGrawHill publishers.
- Lippincott illustrated Review 8th edition Kluwer.W.
- Essentials of Medical Biochemistry vol 1&2 by Mushtaq Ahmed.

Pathology

- Vinary Kumar, Abul K. Abbas and Nelson Fausto Robbins and Cotran, Pathologic basis of disease. WB Saunders.
- Richard Mitchall, Vinary Kumar, Abul K. Abbas and Nelson Fausto Robbins and
- Cotran, Pocket Companion to Pathologic basis of diseases. Saunder Harcourt.
- Walter and Israel. General Pathology.
- Churchill Livingstone.

Medicine

- Davidson's Principles and Practice of Medicine

Pharmacology

- Basic and Clinical Pharmacology by Katzung, McGraw-Hill.
- Pharmacology by Champe and Harvey, Lippincott Williams & Wilkins

Behavioural Sciences

- **Handbook of Behavioural Sciences by Prof. Mowadat H.Rana, 3rd Edition**
- **Medical and Psychosocial aspects of chronic illness and disability SIXTH EDITION by Donna R.Falvo, PhD Beverely E.Holland, PhD, RN**

Community medicine

- Parks Textbook of Preventive and Social Medicine. K. Park (Editor)
- Public Health and Community Medicine
- **Ilyas, Ansari (Editors)**

Surgery

- **Bailey and Love's short practice of surgery**

Islamiyat

- **Standard Islamiyat (compulsory) for B.A, BSc, MA, MSc, MBBS by Prof M Sharif Islahi.**
- **Ilmi Islamiyat(compulsory) for BA, BSc & equivalent.**

ASSESSMENT METHODOLOGY

FORMATIVE:

Theory: Single best multiple choice question and short essay tests will be conducted according to the schedule given

1ST YEAR MBBS TEST SCHEDULE:

CARDIOVASCULAR & RESPIRATORY MODULE

DATE	TEST
27/10/25	Anatomy, Physiology, Biochemistry
17/11/25	Anatomy, Physiology, Biochemistry, Allied
08/12/25	Anatomy, Physiology, Biochemistry
19/12/25	Block Examination (Written)
22-24/12/25	Block Examination (OSPE/OSVE/OSCE)

SUMMATIVE (To be held at the end of 1st Year MBBS)

TABLE OF SPECIFICATIONS

MBBS 1st Professional

Block-3

Theme	Subject	Written Exam			Oral/Practical/Clinical Exam			
		MCQ (1 mark)	SEQ (5 mark each)	Marks	OSPE (8 marks each observed)	OSCE (5 marks each observed)	OSVE (14 marks each observed)	Marks
Normal Structure	Anatomy applied/clinical	17	03	32	03	-	01	38
Normal Function	Physiology applied/clinical	31	04	51	04	-	01	46
	Biochemistry applied/clinical	19	02	29	02	-	01	30
Disease Burden & Prevention	Community Medicine & Public Health	06	-	06	-	-	-	-
	Behavioral Sciences	02	-	02	-	-	-	-
Pathophysiology & pharmacotherapeutics	Pathology	10	01	15	01	-	-	08
	Pharmacology	05	-	05	01	-	-	08
CFRC	CF-I	-	-	-	-	01	-	05
PERLs	PERLs-I	-	-	-	-	01	-	05
Total		**90**	**10x5=50**	**140**	**011 stations x 08 = 88**	**02 stations x 05 = 10**	**03 stations x 14=42**	**140**

TIME TABLE/ PLANNER
CARDIOVASCULAR MODULE

Lahore Medical & Dental College
Canal Bank North, Tulspura, Lahore
Phone No. 0346-4418891-98

1st YEAR M.B.B.S TIMETABLE SESSION 2023-2024 w.e.f. 29.09.2025 till 14.11.2025

DAY & TIME	08:00 a.m. to 09:30 a.m.	09:30 a.m. to 10:20 a.m.	10:20 a.m. to 11:10 a.m.	11:10 a.m. to 11:40 a.m.	11:40 a.m. to 12:30 p.m.	12:30 p.m. to 01:20 p.m.	01:20 p.m. to 02:10 p.m.	02:10 p.m. to 03:00 p.m.
MONDAY	Physio. Practical A+B Physio. Tutorial C+D Biochem. Tutorial E+F Biochem/Histo. Practical/Patho prac [1] G+H CFRC I+J	Physiology Lecture Theater No. 1	Biochemistry Lecture Theater No. 1		[3] Anatomy / Aging Lecture Theater No. 1	Physiology Lecture Theater No. 1	[4] Disease Prevention & Impact (Community Medicine)/ (Behavior sciences) Lecture Theater No. 1	[5] Physiology/ Pathology Lecture Theater No. 1
TUESDAY	Physio. Practical A+B Physio. Tutorial C+D Biochem. Tutorial E+F Biochem/Histo. Practical/Patho prac [1] G+H CFRC I+J	Physiology Lecture Theater No. 1	Biochemistry Lecture Theater No. 1		[3] Anatomy / Aging Lecture Theater No. 1	Physiology Lecture Theater No. 1	Pharmacology Lecture Theater No. 1	[6] Disease Prevention & Impact (Community Medicine)/ (Behavior sciences) Lecture Theater No. 1
WEDNESDAY	Physio. Practical A+B Physio. Tutorial C+D Biochem. Tutorial E+F Biochem/Histo. Practical/Patho prac [1] G+H CFRC I+J	Physiology Lecture Theater No. 1	Biochemistry Lecture Theater No. 1	**Break**	[3] Anatomy / Aging Lecture Theater No. 1	Physiology Lecture Theater No. 1	[4] /[6] Disease Prevention &Impact (Community Medicine)/ (Behavior sciences) Lecture Theater No. 1	[7] PERL/ Biochemistry Lecture Theater No. 1
THURSDAY	Physio. Practical A+B Physio. Tutorial C+D Biochem. Tutorial E+F Biochem/Histo. Practical/Patho prac [1] G+H CFRC I+J	Physiology Lecture Theater No. 1	[2] Biochemistry / Aging Lecture Theater No. 1		[3] Anatomy / Aging Lecture Theater No. 1	**12:30 p.m. to 01:15 p.m.** Islamic studies (Quran) & Pak.studies Lecture Theater No. 1	**01:15 p.m. to 02:00 p.m.** [5] Physiology/ Pathology Lecture Theater No. 1	**02:00 p.m. to 03:00 p.m.** Anatomy Dissection Dissection Hall
FRIDAY	Physio. Practical A+B Physio. Tutorial C+D Biochem. Tutorial E+F Biochem/Histo. Practical/Patho prac [1] G+H CFRC I+J	Physiology Lecture Theater No. 1	Physiology Lecture Theater No. 1	**11:10a.m. to 12:10 p.m.** Anatomy Dissection Dissection Hall	**12:10 p.m. to 01:00p.m.** Physiology Lecture Theater No. 1			

TIMETABLE/ PLANNER
RESPIRATORY MODULE

LAHORE MEDICAL & DENTAL COLLEGE

Lahore Medical & Dental College
Canal Bank North, Tulspura, Lahore
Phone No. 0346-4418891-98

1st YEAR M.B.B.S TIMETABLE SESSION 2022-2023 w.e.f. 17-11-2025 till 12-12-2025

DAY & TIME	08:00 a.m. to 09:30 a.m.	09:30 a.m. to 10:20 a.m.	10:20 a.m. to 11:10 a.m.	11:10 a.m. to 11:40 am	11:40 am to 12:30 p.m.	12:30 p.m. to 02:10 p.m.	02:10 p.m. to 03:00 p.m.
MONDAY	Physiology Tutorial A+B Physiology Practical C+D Biochemistry Tutorial E+F Path/phar/ Histo./ Biochem. Pract. [1] G+H Clinical Skills Foundation I+J	Physiology Lecture Theater No. 1	Anatomy Lecture Theater No. 1	**Break**	Physiology Lecture Theater No. 1	Anatomy Dissection Dissection Hall	Physiology / Pathology / Aging [4] Lecture Theater No. 2
TUESDAY	Physiology Tutorial A+B Physiology Practical C+D Biochemistry Tutorial E+F Path/phar/ Histo./ Biochem. Pract. [1] G+H Clinical Skills Foundation I+J	Physiology Lecture Theater No. 1	Anatomy Lecture Theater No. 1		Pathology Lecture Theater No. 2	Anatomy Dissection Dissection Hall	Disease Prevention & Impact (Community Medicine / Behavioral Sciences) [5] Lecture Theater No. 2
WEDNESDAY	Physiology Tutorial A+B Physiology Practical C+D Biochemistry Tutorial E+F Path/phar/ Histo./ Biochem. Pract. [1] G+H Clinical Skills Foundation I+J	Physiology Lecture Theater No. 1	Biochemistry Lecture Theater No. 1		Disease Prevention & Impact (Community Medicine) Lecture Theater No. 2	Anatomy Dissection Dissection Hall	PERL / Physiology [6] Lecture Theater No. 2
THURSDAY	Physiology Tutorial A+B Physiology Practical C+D Biochemistry Tutorial E+F Path/phar/ Histo./ Biochem. Pract. [1] G+H Clinical Skills Foundation I+J	Physiology Lecture Theater No. 1	Pathology/ Pharma Lecture Theater No. 2		Disease Prevention & Impact (Community Medicine) [3] Lecture Theater No. 2	Anatomy Dissection Dissection Hall	Physiology Lecture Theater No. 1
FRIDAY	Physiology Tutorial A+B Physiology Practical C+D Biochemistry Tutorial E+F Path/phar/ Histo./ Biochem. Pract. [1] G+H Clinical Skills Foundation I+J			**11:00 a.m. to 11:40 a.m.**	**11:40 a.m. to 12:20 pm**	**12:20pm to 01:00 p.m.**	
		Physiology Lecture Theater No. 1	Biochemistry Lecture Theater No. 1	**Break**	Physiology Lecture Theater No. 1	Physiology Lecture Theater No. 1	