Study Guide
Block-III

1st Year MBBS

Sharif Medical & Dental College, Lahore

CONTENTS

	Page No.
Vision & Mission	1
List of Abbreviations	2
Modular Committee	3
Faculty	5
Rationale of Curriculum	7
Instructional Strategies	8
Rationale of Cardiovascular-I Module	12
Curriculum of Individual Subjects	14
Human Anatomy	15
Medical Physiology	20
Medical Biochemistry	26
Pathophysiology and Pharmacotherapeutics	29
Disease Prevention and Impact	30
Aging	31
Rationale of Respiratory-1 Module	32
Curriculum of Individual Subjects	33
Human Anatomy	34
Medical Physiology	39
Medical Biochemistry	43
Pathophysiology and Pharmacotherapeutics	44
Disease Prevention and Impact	45
Aging	46
PERLs (Professionalism, Ethics, Research, Leadership)	47
Clinical Skills (C-FRC)	48
Holy Quran and Islamiyat	49
Civics (for Students Other Than Muslims)	51
Pakistan Studies	53
Assessment Strategies	54
The Marks Distribution in Each Subject is Given in Table	55
Cardiovascular and Respiratory Module Total Hours=346	56
Resource Books	57
Anatomy	57
Physiology	57
Biochemistry	57
Pathology	57
Behavioral Sciences	57
Community Medicine	58
Islamiyat/Pakistan Studies	58

Vision and Mission

Vision & Mission of UHS

Vision statement

UHS is a leading university aiming to keep its graduates apt with the ever-emerging global health challenges evolving educational methodologies and emerging technological advancements to maintain its distinguishable positions as a Medical University.

Mission statement

UHS shall we continue to strive for producing a human resource par and excellence to cater for the health needs of the people of Punjab and Pakistan.

Vision & Mission of SMDC

Vision

To be recognized for the provision of a safe and functional environment conducive to collaborative teaching & learning, comfortable working atmosphere and conducting world class research through professionalism and excellence.

'Veritas et Devotio'

Mission

Sharif Medical & Dental College is dedicated to best serving the nation through preservation and dissemination of advanced knowledge and educating the students by latest trends in learning and research reaching levels pars excellence.

The Institution is committed to provide standardized quality medical education to its students by inculcating professional knowledge, skills, and responsibilities in them with the aim of:

- Preparing them as modern physicians having initiative to act as future leaders in their respective fields and becoming lifelong learners.
- Encouraging the spirit of critical thinking through research and publication.
- Building up an understanding of the ethical values compatible with our religion, culture, and social norms.
- Developing a sense of being responsible citizens of society possessing professional competence and instilling in them the values of hard work and dedication thus preparing them to be accountable to the stakeholders and the state.

The Institution is devoted to keep abreast its faculty with the latest trends in Medical Education encompassing teaching/learning methodologies, assessment tools, research opportunities and professionalism to facilitate their professional development, competencies, and commitment towards continues learning.

Our patient-centered mission is achieved by outstanding medical care & services in professional practice with due emphasis and focus on our local health needs.

Our mission further elaborates upon establishing academic and research facilities in areas of local demand under global gold standards and leading advancement in research, education & patient care.

LIST OF ABBREVIATIONS

Abbreviation	Subjects
A	Anatomy
Ag	Aging
B	Biochemistry
BS	Behavioral Sciences
C	Civics
CSIM	Clinical Skills In Medicine
CM	Community Medicine
P	Physiology
Ph	Pharmacology
Pa	Pathology
FM	Forensic Medicine
ENT	Ear Nose Throat
O	Ophthalmology
Psy	Psychiatry
M	Medicine
S	Surgery
Pe	Pediatrics
GO	Gynaecology and Obstetrics
QI	Quran and islamiyat
PERLs	Professionalism, Ethics, Research, Leadership

MODULAR COMMIITTEE

For implementation of modular integrated curriculum 2023, committees of following faculty members are notified for smooth conduction of the educational process and for the implementation of curriculum guidelines.

Sr No.	Foundation Module Calendar	Faculty Members
1.	Foundation Module Committee	• Prof. Maimoona Hafeez, Prof & Head Dept of Gynae • Prof. Uzma Ahsan, Prof & Head Dept of Dermatology • Prof. Maria Aslam, Prof & Head Dept of Pathology • Prof. Taj Jamshaid, Prof Dept of Medicine • Prof. Sana Qanber, Prof Dept of Physiology • Dr. Ammara Ghafoor, Associate Professor Dept of Anatomy • Dr. Hassan Jamil, Associate Professor Dept of Biochemistry • Dr. Faiza Parveen, Associate Professor Dept of Pharmacology • Dr. Amna Iqbal, Associate Professor Dept of Community Medicine • Dr. Nausheen Iftikhar, Associate Professor Dept of Peadritics • Miss. Sara Sherazi, Department of Psychiatry
2.	Hematopoietic & Lymphatic Module Committee	• Prof. Uzma Ahsan, Prof & Head Dept of Dermatology • Prof. Maria Aslam, Prof & Head Dept of Pathology • Prof. Taj Jamshaid, Prof Dept of Medicine • Prof. Ghazal Mansoor, Prof & Head Dept of Physiology • Dr. Ammara Ghafoor, Associate Professor Dept of Anatomy • Dr. Hassan Jamil, Associate Professor Dept of Biochemistry • Dr. Fauzia Perveen, Associate Professor Dept of Pharmacology • Dr. Amna Iqbal, Associate Professor Dept of Community Medicine • Dr. Irfan Ahmed, Associate Professor Dept of Nephrology • Miss. Sara Sherazi, Department of Psychiatry
3.	Musculoskeletal Module Committee	• Prof. Taj Jamshaid, Prof Dept of Medicine • Prof. Mohsin Gillani, Prof & Head Dept of Surgery • Prof. Uzma Ahsan, Prof & Head of Dept Dermatology • Prof. Maria Aslam, Prof & Head Dept of Pathology • Prof. Farooq Azam, Prof & Head Dept of Orthopeadic • Prof. Samra Hafeez, Prof Dept of Biochemistry • Prof. Sana Qanber, Prof Dept of Physiology • Dr. Nadia Ahmed, Associate Professor Dept of Anatomy • Dr. Amna Iqbal, Associate Professor Dept of Community Medicine • Dr. Nausheen Iftikhar, Associate Professor Dept of Peadritics • Miss. Sara Sherazi, Department of Psychiatry
4.	Cardiovascular Module Committee	• Prof. Taj Jamshaid, Prof Dept of Medicine • Prof. Mohsin Gillani, Prof & Head Dept of Surgery • Prof. Maria Aslam, Prof & Head Dept of Pathology • Prof. Ghazal Mansoor, Prof & Head Dept of Physiology • Prof. Samra, Prof Dept of Biochemistry • Prof. Nadia Ahmad Associate Professor Dept of Anatomy • Dr. Rafia Irum, Associate Professor Dept of Radiology

		• Dr. Nausheen Iftikhar, Associate Professor Dept of Peadritics • Dr. Fauzia Perveen, Associate Professor Dept of Pharmacology • Dr. Amna Iqbal, Associate Professor Dept of Community Medicine • Miss. Sara Sherazi, Department of Psychiatry
5.	Respiratory Module Committee	• Prof. Mohsin Gillani, Prof & Head Dept of Surgery • Prof. Taj Jamshaid, Prof Dept of Medicine • Prof. Maria Aslam, Prof & Head Dept of Pathology • Prof. Sarmad Saif, Prof Dept of Anesthesia • Prof. Maria Aslam, Prof & Head Dept of Pathology • Prof. Farooq Azam, Prof & Head Dept of Orthopeadic • Prof. Sana Qanber, Prof Dept of Physiology • Dr. Ammara Ghafoor, Associate Professor Dept of Anatomy • Dr. Farah Hanif, Associate Professor of Forensic • Dr. Nausheen Iftikhar, Associate Professor of Peadritics • Dr. Hassan Jamil, Associate Professor Dept of Biochemistry • Dr. Fauzia Parveen, Associate Professor Dept of Pharmacology • Miss. Sara Sherazi, Department of Psychiatry
6.	PBL Committee	• Prof. Taj Jamshaid, Prof Dept of Medicine • Prof. Fouzia Butt, Prof Dept of Gynae • Dr. Ammara Ghafoor, Associate Professor Dept of Anatomy • Dr. Sana Qanber, Prof Dept of Physiology • Dr. Hassan Jamil, Associate Professor Dept of Biochemistry • Dr. Fauzia Parveen, Associate Professor Dept of Pharmacology • Dr. Amna Iqbal, Associate Professor Dept of Community Medicine) • Dr. Nausheen Iftikhar, Associate Professor Dept of Peadritics • Dr. Salman Akhtar, Associate Professor Dept of Surgery • Miss. Sara Sherazi, Department of Psychiatry

FACULTY

NAME	DEPARTMENT	DESIGNATION	E-MAIL
ANATOMY			
Prof. Nausheen Raza	Anatomy	Professor	nausheen410@gmail.com
Prof. Tasneem Raza	Anatomy	Professor	tasnimaamerraza@gmail.com
Dr. Ammara Ghafoor	Anatomy	Associate Professor	nabeeha.shahid1507@gmail.com
Dr. Nadia Ahmad	Anatomy	Associate Professor	diaejaz_74@hotmail.com
Dr. Mamoona Shaukat	Anatomy	Assistant Professor	monausman25@gmail.com
Dr. Ittrat Umair	Anatomy	Demonstrator	ittratu@gmail.com
Dr. Kalsoom Ayesha Rehman	Anatomy	Demonstrator	kalsoom_aisha@yahoo.com
BIOCHEMISTRY			
Dr. Gul-e-Raana	Biochemistry	HOD & Professor	guleraana60@gmail.com
Dr. Samra Hafeez	Biochemistry	Professor	dr.samraisrar1993@gmail.com
Dr.Hassan Jamil	Biochemistry	Associate Professor	biohassan86@gmail.com
Dr.Anam Rehman	Biochemistry	Demonstrator	anamrana492@gmail.com
Dr.Haseeb Afzal	Biochemistry	Demonstrator	haseebafzal1533@gmail.com
Dr. Sana Fatima	Biochemistry	Demonstrator	sannazainn@gmail.com
Dr Hadiqa Saeed	Biochemistry	Demonstrator	Hadiqasaeed3@gmail.com
PHYSIOLOGY			
Dr. Ghazal Mansoor	Physiology	Professor	ghazalmajeed100@gmail.com
Dr. Sana Qanber Abbasi	Physiology	Professor	sanaqanberabbasi01@gmail.com
Dr. Qurat-ul-ain	Physiology	Associate Professor	quratkundi@gmail.com
Dr. Sana Javaid	Physiology	Assistant Professor	sana5120@hotmail.com
Dr. Nazish Jamil	Physiology	Assistant Professor	nazishjamil875@gmail.com
Dr. Fizza Laraib	Physiology	Demonstrator	fizzalaraib23@gmail.com
Dr. Maham Fatima	Physiology	Demonstrator	fatimamaham96@outlook.com
Dr. Wajih Malik	Physiology	Demonstrator	drwajihmalik@gmail.com
Dr. Asma Siddiqi	Physiology	Demonstrator	asmasiddiqi214@gmail.com
Dr. Aniqua Shafique	Physiology	Demonstrator	aniqasfq225@gmail.com
PATHOLOGY			
Prof. Maria Aslam	Pathology	Professor & HOD	mariaaslam77@outlook.com
Dr. Remisha Zahid	Pathology	Assistant Professor	remishax@gmail.com

PHARMACOLOGY AND THERAPEUTICS			
Prof. Salman Bakhtiar	Pharmacology	Prof & HOD	salman_bakhtiar@hotmail.com
Dr. Sabeen Arjumand	Pharmacology	Associate Prof	sabeen_jabbar@hotmail.com
COMMUNITY MEDICINE AND PUBLIC HEALTH			
Dr. Samina Khalid	Community Medicine	Associate Professor	saminakhalid83@yahoo.com
Dr.Amna Iqbal Butt	Community Medicine	Assistant Professor	dr_amnawaqas@hotmail.com
IMPACT (EPIDEMIOLOGY, SOCIOLOGY/SOCIETY, P heyUBLIC HEALTH)			
Dr.Ayaz M.Khan	Behavioral Sciences	Assistant Professor	dr.ayazmkhan@gmail.com
Sarah Shirazi	Behavioral Sciences	Sr.Clinical Psychologist	shirazi1255@gmail.com
PERLS (PROFESSIONALISM,ETHICS,RESEARCH,LEADERSHIP)			
Dr. Uzma Ahsan	Medical Education	Head of Department	uzma_ahsan@yahoo.com
Dr. Sakina M. Joiya	Medical Education	Demonstrator	drsakinajoiya@gmail.com
HOLY QURAN AND ISLAMIYAT / CIVICS OTHER THAN MUSLIM STUDENTS			
Ms. Oniba siddique	Islamiyat/Civics/Pak Studies	Lecturerer	onibasiddiquue@gmail.com

RATIONALE OF CURRICULUM

What is Curriculum

- A curriculum is a planned document which provides a time bound schedule of educational activities aimed at achieving predefined learning outcomes.
- Need assessment.
- Defining learning outcomes
- Preparation of table of specification for knowledge, skill, and attitude to be taught.
- Identification of modes of information transfer
- Implementation plan
- Assessment
- Program evaluation strategies to ensure continuous improvement.

Rationale of Developing Curriculum

The major objective of developing curriculum is to improve the educational offerings and its instructional activities and practices to increase student engagement in the learning process and improve student's achievements. Human anatomy is the study of the structures of the human body including cells, tissues, organs, and organ systems. An understanding of anatomy is the key to the practice of medicine and other areas of health. It has been found that the introduction of a greater clinical focus in basic science teaching may help to bridge the gap between basic science and clinical practice as one gets to learn not only the theoretical concepts but practical functionalities of the human body.

Vertical Integration

a. Vertical integration

It is between basic sciences and clinical medicine and has been found to stimulate rather than superficial learning, thereby resulting in better understanding of biomedical principles. It improves motivation, enhances deep learning, and prepares for lifelong learning.

b. Horizontal integration

It is among all the basic science subjects including anatomy, physiology and biochemistry and has been found to stimulate rather than superficial learning, thereby resulting in better understanding of biomedical principles. It improves integration, enhances critical thinking, and prepares the students for multidisciplinary training opportunity.

c. Hybrid teaching

Considering the Covid pandemic, teaching was shifted to online classes while we followed the hybrid curriculum with theory topics covered in online teaching and clinical teaching on face-to-face platform. The benefit of hybrid teaching was better use of the teaching resources (ability to improve how teaching resources are used, e.g, mix of physical classroom and remote learning can allow the smaller classroom to cater for more students) while saving large room for lectures. It also reduces student absentees (if students are physically unwell and tried to attend class, they can engage in class through remote learning, meaning they no longer need to miss out the class and can attend classes from home

INSTRUCTIONAL STRATAGIES

Delivery of our curriculum follows the following diverse instructional strategies To enable the diversity of learning patterns to be facilitated.

Large Group Interactive Session (LGIS)

Lecture format is the most widely used approach to teaching, especially in a large class size with an average attention span of 20-30 mins. Interactive lecturing involves a two-way interaction between the presenter and the participants. Interactive methods like brainstorming, buzz group, simulation, role play, and clinical cases can be used.

Significance of its usage

- Relaxed environment, diverse opinions, active involvement
- Increase attention and motivation.
- Independence and group skills.
- Cost effective.
- Suitable for taking advantage of available audiovisual technologies.

Team Based Learning (TBL)

TBL is a uniquely powerful form of small group learning. It provides a complete coherent framework for building a flipped course experience. There are four essential elements of TBL which include:

- Teams must be properly formed and managed (5-7 students)
- Getting students ready.
- Applying course concepts
- Making students accountable

Significance of its usage

- Students are more engaged.
- Increased excitement in TBL classroom
- Teams outperforms best members.
- Students perform better in final and standardized exams.

Problem Based Learning (PBL)

It is an instructional student-centered approach in which students work in small groups on a health problem, identifying their own educational needs and being responsible for the acquisition of the knowledge required to understand the scenario.

Significance of its usage

- Teamwork
- Critical evaluation of literature
- Self-directed learning and use of resources
- Presentation skills
- Leadership
- Respect for colleagues' views

Case Based Learning (CBL)

It is an inquiry structured learning experience utilizing live or simulated patient cases to solve, or examine a clinical problem, with the guidance of a teacher and stated learning objectives.

Significance of its usage

- Induce a deeper level of learning by inculcating critical thinking skills.
- Flexibility on use of case
- Helps students acquire insightful information.
- Stay abreast with novel advancements in healthcare

Small Group Discussion (SGD)

SGD is a class or short series of classes, in which one or more instructors provides intensive instruction on some subject to a small group. Its purpose is to explore students' point of view, allowing time for discussion, and inculcating self-directed, reflective learning skills.

Significance of its usage

- Develop and assess the extent of background knowledge of students, which enables them to properly understand concepts which may not have been understood in lectures.
- Develop problem-solving skills.
- Develop practice of self-learning.
- Reduced time to understand the topic.

Reflective Writing

It is a metacognitive process that occurs before, during and after the situation with the purpose of developing greater understanding of both the self and situation so that future encounters with the situation are informed from previous encounters.

Significance of its usage

- Questioning attitude and new perspectives.
- Areas for change and improvement.
- Respond effectively to new challenges.
- Critical thinking and coping skills

Bedside Teaching

Teaching and learning that occurs with actual patient as the focus. It occurs in wards, emergency departments, operating rooms, and high dependency units.

Significance of its usage

- Stimulus of clinical contact
- Psychomotor skills
- Communication skills
- Language Skills
- Interpersonal skills
- Professional attitudes and empathy
- Role modelling

Skill laboratories

It refers to specifically equipped practice rooms functioning as training facilities offering hands on training for the practice of clinical skills within non-threatening environment prior to their real-life application This applies to both basic clinical skills as well as complex surgical skills.

Significance of its usage

- Controlled, anxiety-free, and risk-free learning environment to students.
- A platform for repeated practice for mastery in relevant clinical skills
- Increase the preparedness of student learners before transitioning to the real hospital setting.
- Build strong communication skills.
- Enable learners to make critical decisions.

Laboratory Practical

Lab practical involves things like identifying a structure, a type of stain through a microscope, a problem with preparation, reading biochemical test results and answering safety questions. These simulations allow students to attempt the experiments in the laboratory in a risk-free way that provides the opportunity to make mistakes and learn how to correct them using the immediate feedback generated.

Significance of its usage

- Enhance mastery of subject matter.
- Develop scientific reasoning.
- Develop practical skills.
- Develop teamwork abilities.

Demonstrations

The demonstration method in teaching can be defined as giving a demo or performing a specific activity or concept. It is a teaching-learning process carried out in a very systematic manner.

Significance of its usage

- Promotes learning and correlates theory with practice.
- Sharpens observation skills.
- Sustain interests in learning environment.
- Helps teacher to evaluate students' response

Case Presentations

It is a teaching method which provides descriptive information about a clinical patient scenario and to share this educational experience with the general medical and scientific community. It prepares students for clinical practice, using authentic clinical cases by linking theory to practice with the help of inquiry-based learning methods.

Significance of its usage

- Cultivate the capacity for critical analysis.
- Judgement and Decision making
- Facilitate creative problem solving.
- Allow students to develop realistic solutions to complex problems

RATIONALE OF CARDIOVASCULAR-I MODULE

The Cardiovascular system comprises the study of the heart & circulatory system. The initial learning activities will help in understanding the normal structure & development of the organs of the system. Understanding of anatomical details of each component of CVS will be accompanied by study of normal physiological mechanisms. This will help in better understanding the possible pathological conditions of the system, including some of the most prevalent conditions in society like ischemic heart disease, hypertension, shock, heart block, heart failure. This will be followed by discussion on some important group of drugs used for treatment and/or prevention of these conditions (administration route, mechanism of action and side effects). The impact of cardiovascular diseases on society and the effect of ageing on cardiovascular system will be discussed.

Module Outcomes

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

HEMES
• Heart • Circulation
Clinical Relevance
• Cardiac Failure • Arrhythmias • Atherosclerosis and Ischemic heart diseases • Hypertension • Shock • Congenital Heart diseases • Peripheral arterial diseases

CURRICULUM OF INDIVIDUAL SUBJECTS

HUMAN ANATOMY

THEORY

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 14		MIT (Mode of information transfer)
	GROSS ANATOMY UPPER LIMB	DISCIPLINE	TOPIC	
CV-A-001	• Define mediastinum giving its boundaries and compartments. List the contents of its various compartments.	Human Anatomy	Mediastinum	SGD (Small Group Discussion)
	• Justify the clinical picture of superior mediastinum syndrome anatomically	Integrate with Surgery		LGIS (Large group interactive session)
	• 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.	Human Anatomy		SGD (Small Group Discussion)
CV-A- 002	• Describe Pericardium and its parts with emphasis on their neurovascular supply and lymphatic drainage. • Describe the pericardial cavity mentioning transverse and oblique sinuses. Discuss their clinical significance	Integrate with Surgery	Pericardium	LGIS (Large group interactive session)
	• Describe the anatomical correlates of pericardial rub, pericardial pain, pericarditis, pericardial effusion, and cardiac tamponade. • Describe the anatomical basis for pericardiocentesis.	Integrate with Medicine		LGIS (Large group interactive session)
CV-A- 003	• Describe the external features of the heart. • List various chambers of heart mentioning their salient features and openings. • Describe the arterial supply of heart: coronary arteries and their distribution with special emphasis on collaterals established during ischemia. • Describe the sites of anastomosis	Human Anatomy	Heart	SGD (Small Group Discussion)

	between right and left coronary arteries with the participating vessels.			
	• Discuss the anatomical correlates of cardiac arterial supply. • Describe the anatomical basis for cardiac catheterization	Integrate with cardiology/ Medicine	Heart	LGIS (Large group interactive session)
	• Describe the anatomical correlates of electrocardiography, heart block, atrial fibrillation, artificial cardiac pacemaker, cardiac referred pain	Integrate with Medicine		LGIS (Large group interactive session)
	• Describe the anatomical basis for echocardiography, coronary angiography, angioplasty, and coronary grafts. • Describe the features of angina pectoris and myocardial infarction and correlate them anatomically	Integrate with Cardiology/ Medicine		LGIS (Large group interactive session)
	• Describe the venous drainage of the heart. • Describe the alternative venous routes to the heart. • Identify the vessels supplying the heart with their origins/terminations. • Describe the Lymphatics of the heart. • Describe the formation, relations, and distribution of cardiac plexus. • Describe components and significance of fibrous skeleton of heart. • Describe the cardiac valves	Human Anatomy		SGD (Small Group Discussion)
	• Explain the anatomical basis for valvular heart diseases	Integrate with Cardiology/ Medicine		LGIS (Large group interactive session)
	• Perform surface marking of various anatomical landmarks of heart and great vessels	Human Anatomy		SGD (Small Group Discussion)
	• Perform percussion and auscultation of heart	Integrate with Medicine		LGIS (Large group interactive session)
	• Identify the salient features of heart and great vessels on CT/ MRI	Integrate with Radiology		LGIS (Large group interactive session)
CV-A-004	• Describe the surgical importance of pericardial sinus	Surgery	Pericardial sinus	LGIS (Large group interactive session)
CV-A-005	• Discuss the anatomical principles of Varicose Veins	Surgery	Varicose Veins	LGIS (Large group interactive session)
EMBRYOLOGY & POST-NATAL DEVELOPMENT		**TOTAL HOURS = 14**		
CODE	**SPECIFIC LEARNING OBJECTIVES**	**DESCIPLINE**	**TOPIC**	**MIT (Mode of Information)**

CV-A- 006	• Describe the early development of heart and blood vessels	Human Embryology	Introduction	LGIS (Large group interactive session)
CV-A- 007	• Define parts of primitive heart tube and give its folding. • Describe the development of various chambers of the 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)	Human Embryology	Development of Heart	LGIS (Large group interactive session)
CV-A-7a	• Describe the embryological basis of dextrocardia and ectopia cordis. • Describe the partitioning of primordial heart: atrioventricular canal and atrium. • Describe the development of sinus venosus	Human Embryology	Development of Heart and Development of Lymphatic System	LGIS (Large group interactive session)
	• List clinically significant types of atrial septal defects along with their embryological basis and features. Describe probe patent foramen ovale	Integrate with Pediatrics		LGIS (Large group interactive session)
	• Describe the partitioning of truncus arteriosus and bulbus cordis. • Describe the formation of ventricles and interventricular septum	Human Embryology		LGIS (Large group interactive session)
CV-A- 008	• Describe the clinical features and embryological basis of ventricular septal defects	Integrate with Pediatrics		LGIS (Large group interactive session)
	• Describe the development of cardiac valves and conducting system.	Human Embryology		LGIS (Large group interactive session)
	• Describe the development of lymphatic system	Human Embryology		LGIS (Large group interactive session)
CV-A- 009	• Describe the embryological correlates and clinical presentation of developmental defects of heart: Tetralogy of Fallot, Patent ductus arteriosus, Unequal division of arterial trunks, Transposition of great vessels and Valvular stenosis, Coarctation of aorta	Integrate with Pediatrics	Development of Arteries	LGIS (Large group interactive session)
	• Describe the formation and fate of pharyngeal arch arteries	Human Embryology		LGIS (Large group interactive session)
	• Describe the anomalies of great arteries emerging from heart: Coarctation of aorta, anomalous arteries	Integrate with Cardiology/ Medicine		LGIS (Large group interactive session)
CV-A- 010	• Describe the development of embryonic veins associated with developing heart: Vitelline veins, Umbilical Veins and Common cardinal veins and their fate. • 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	Human Embryology	Development of Veins	LGIS (Large group interactive session)

CV-A- 011	• List the derivatives of fetal vessels and structures: Umbilical vein, ductus venosus, umbilical artery, foramen ovale, ductus arteriosus	Human Embryology	Fetal Vessels & Circulation	LGIS (Large group interactive session)
	• Describe Fetal and neonatal circulation mentioning transitional neonatal circulation with its clinical implication	Integrate with Pediatrics/ Obgyn		LGIS (Large group interactive session)
CV-A- 012	• List clinically significant types of atrial septal defects along with their embryological basis and features. Describe patent foramen ovale.	Pediatrics	Congenital Heart defects	LGIS (Large group interactive session)
	• 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			LGIS (Large group interactive session)
CODE	**SPECIFIC LEARNING OBJECTIVES**	**DISCIPLINE**	**TOPIC**	**MIT (Mode of information)**
MICROSCOPIC ANATOMY (HISTOLOGY & PATHOLOGY)			**Total Hours = 4**	
CV-A- 013	• Describe the microscopic and ultramicroscopic structure of cardiac muscle emphasizing on T- tubules, sarcoplasmic reticulum, and intercalated discs.	Histology	Cardiac Muscle	LGIS (Large group interactive session)
	• Identify, draw, and label histological structure of cardiac muscle			LGIS (Large group interactive session)
CV-A- 014	• Describe general histological organization of blood vessels: Tunica intima, media, and adventitia.	Histology	Blood Vessels Organization	LGIS (Large group interactive session)
	• Identify, draw, and label histological sections of elastic artery, muscular artery, arterioles, vein, capillaries, and sinusoids			LGIS (Large group interactive session)
CV-A- 015	• Describe histological features of arteries: Muscular arteries, elastic arteries, Arterioles	Histology	Arteries	LGIS (Large group interactive session)
CV-A- 016	• Describe histological features of veins and exchange vessels: large veins, medium sized veins, venules, Capillaries, and sinusoids	Histology	Veins	LGIS (Large group interactive session)
	• Compare and contrast the light microscopic structure of arteries and veins			LGIS (Large group interactive session)
CV-A- 017	• Describe the histopathological basis of thrombus and embolus formation.	Integrate with Pathology	Thrombus/ Embolus formation	LGIS (Large group interactive session)
CV-A- 018	• Explain the histological basis of arteriosclerosis and atherosclerosis	Histology	Arteriosclerosis atherosclerosis	LGIS (Large group interactive session)
CV-A- 019	• Describe role of arterioles in hypertension	Histology	Hypertension	LGIS (Large group interactive session)

PRACTICAL

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 10		MIT (Mode of information transfer)
	HISTOLOGY	DISCIPLINE	TOPIC	
CV-A-020	• Identify, Draw and Label histological structure of cardiac muscles.	Histology	Histological features of Cardiac Muscle	Laboratory Practical
CV-A-021	• Identify, draw and label histological sections of elastic artery, muscular artery, arterioles, vein, capillaries and sinusoids	Histology	Histological features of Cardiac Muscle	Laboratory Practical

MEDICAL PHYSIOLOGY

THEORY

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 34		MIT (Mode of information transfer)
	NORMAL ORGAN FUNCTIONS	DISCIPLINE	TOPIC	
MS-P-001	• Explain the physiological anatomy of 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. • Draw & explain pressure & volume changes of left ventricle during cardiac cycle. • Explain & draw relationship of ECG 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.	Medical Physiology	Cardiac Muscle	LGIS (Large group interactive session) SGD (Small group discussion)
	• Define & give the normal values of the cardiac output, stroke volume, end diastolic volume & end systolic volume	Integrate with Medicine		LGIS (Large group interactive session)
CV-P- 002	• Describe the Frank starling mechanism. • 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 the heart. • Name the receptors present in coronary arterioles. • Explain sympathetic & parasympathetic effects on heart rate & conduction velocity	Medical Physiology	Regulation of heart pumping	LGIS (Large group interactive session)

CV-P- 003	• Draw and explain the conducting system of heart. • Describe the physiological basis and significance of AV nodal delay.	Integrate with Cardiology/ Medicine	Conducting system of heart	LGIS (Large group interactive session)
CV-P- 004	• Enlist, draw, and explain the physiological basis & give durations of waves, intervals, and segments of normal ECG. • Describe the standard limb leads, Augmented limb leads & precordial leads. • 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.	Medical Physiology	Fundamental s of ECG	LGIS (Large group interactive session)
	• Enlist the ECG changes in angina pectoris. • Enlist the ECG changes in myocardial infarction.	Integrate with Medicine		LGIS (Large group interactive session) SGD (Small group discussion)
	• Plot the mean cardiac axis. • Enlist the physiological & pathological causes of right axis deviation of heart. • Enlist the physiological & pathological causes of left axis deviation of heart	Medical Physiology		LGIS (Large group interactive session)
	• Describe the abnormalities of T wave and their causes.	Integrate with Medicine		LGIS (Large group interactive session)
CV-P- 005	• Describe the effect of hypokalemia and hyperkalemia on ECG. • Describe the effect of hypocalcemia and hypercalcemia on ECG.	Integrate with Biochemistry	Effect of electrolyte on ECG	LGIS (Large group interactive session)
CV-P- 006	• Define tachycardia and enlist its causes. • Define bradycardia and enlist its causes.	Integrate with Medicine	Cardiac arrhythmia	LGIS (Large group interactive session)
	• Classify arrhythmias. • Explain the physiological basis of sinus arrythmia. • Explain the physiological basis of reflex bradycardia in Athletes. • Explain the carotid sinus syndrome.	Medical Physiology		LGIS (Large group interactive session)
	• Enlist the causes of atrioventricular block. • Explain the types of atrioventricular blocks. • Explain the ECG changes in 1st, 2nd & 3rd degree heart block.	Integrate with Cardiology/ Medicine		LGIS (Large group interactive session) PBL (Problem Based Learning)
	• Explain the cause, physiological basis & ECG changes in Stokes Adam syndrome/ventricular escape.	Medical Physiology		LGIS (Large group interactive session) PBL (Problem

				Based Learning)
	• Enlist the causes of premature contractions. • Explain the causes and ECG changes of premature atrial contractions.	Integrate with Cardiology/ Medicine		LGIS (Large group interactive session)
	• Explain the physiological basis of pulses deficit.	Medical Physiology		LGIS (Large group interactive session)
	• Explain the causes and ECG changes in PVC. • Enlist the causes and ECG findings in Long QT syndrome. • Explain the causes, physiological basis, features, ECG changes & management of ventricular fibrillation. • Explain the causes, physiological basis, features & ECG changes of atrial fibrillation.	Integrate with Cardiology/ Medicine		LGIS (Large group interactive session)
	• Explain the physiological basis, features & ECG changes of atrial flutter. • Compare Flutter and Fibrillations	Medical Physiology		LGIS (Large group interactive session)
CV-P-007	• Explain the functional parts of circulation (arteries, arterioles, capillaries, veins, venules).	Medical Physiology	Organization of Circulation	LGIS (Large group interactive session)
CV-P-008	• Explain the pressures in systemic & pulmonary circulation. • Explain the types of Blood flow and significance of Reynolds number.	Medical Physiology	Blood flow	LGIS (Large group interactive session)
CV-P- 009	• Discuss acute local control of local blood flow. • Discuss acute humoral control of local blood flow. • Explain long term control of local blood flow. • Name the organs in which auto regulation of blood flow occurs during changes in arterial pressure (metabolic & myogenic mechanisms).	Medical Physiology	Local & Humoral Control of Blood flow	LGIS (Large group interactive session)
CV-P- 010	• Explain the role of autonomic nervous system for regulating the 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 underline Starling's Hypothesis for capillary function	Medical Physiology	Nervous Regulation of circulation	LGIS (Large group interactive session)
CV-P- 011	• Explain the role of the nervous system in rapid control of arterial blood pressure. • Explain the regulation of arterial blood			LGIS (Large group interactive session)

	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 blood pressure. • Explain the Cushing reflex. • Explain the role of abdominal compression reflex to increase the arterial blood pressure.	Medical Physiology	Rapid control of arterial blood pressure	SGD (Small group discussion)
CV-P- 012	• Make a flow chart to discuss the role of renin angiotensin system for long term control of blood pressure. • Make a flow chart to show the regulation of blood pressure in response to increase in ECF volume. • Make a flow chart to show the regulation of blood pressure in response to increase in salt intake.	Medical Physiology	Role of kidneys in long term Regulation of Arterial Blood Pressure	LGIS (Large group interactive session)
CV-P- 013	• Define cardiac output, cardiac index & venous return with their normal values. • Explain the pathological causes of high & low cardiac output. • Discuss the factors regulating cardiac output.	Integrate with Cardiology/ Medicine	Cardiac output	LGIS (Large group interactive session)
	• Discuss factors regulating venous return	Medical Physiology		LGIS (Large group interactive session) SGD (Small group discussion)
CV-P- 014	• Explain the regulation of skeletal muscle blood flow at rest & during exercise.	Medical Physiology	Skeletal muscle circulation	LGIS (Large group interactive session)
CV-P- 015	• Explain the physiological anatomy of coronary circulation. • Explain the regulation of coronary blood flow. • Explain the physiological basis of angina, myocardial & subendocardial infarction	Medical Physiology	Coronary circulation	LGIS (Large group interactive session)
CV-P- 016	• Define & enlist different types of shock.	Medical Physiology	Circulatory shock	LGIS (Large group interactive session)
	• Explain the causes, features, and pathophysiology of hypovolemic/hemorrhagic shock.	Integrate with Pathology		LGIS (Large group interactive session)

	• Explain the causes, features, and pathophysiology of septic shock. • Explain the causes, features, and pathophysiology of neurogenic shock. • Explain the causes, features, and pathophysiology of anaphylactic shock.			
	• Discuss the treatment of different types of shock.	Integrate with Medicine		LGIS (Large group interactive session)
CV-P- 017	• Explain the different stages of shock. • 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.	Medical Physiology	Heart Sounds	LGIS (Large group interactive session) SGD (Small group discussion) PBL (Problem Based Learning)
	• Enlist the different types of heart sounds and explain the physiological basis of each. • Enlist the causes of 3rd and 4th heart sounds. • Explain the causes & physiological basis of murmurs caused by valvular lesions.	Integrate with Medicine		LGIS (Large group interactive session)
CV-P- 018	• Classify different types of heart failure. • Discuss the signs and symptoms of Heart failure. • Discuss the management of Heart failure.	General Medicine/ Cardiology	Heart Failure	LGIS (Large group interactive session)
CV-P-019	• Discuss the signs and symptoms of: Arrhythmias. • Discuss the management of Arrhythmias.		Arrhythmias	LGIS (Large group interactive session)
CV-P- 020	• Enlist various categories of ischemic heart diseases. • Discuss the signs and symptoms of ischemic heart diseases. • Discuss the management of ischemicheart diseases.		Ischemic Heart Disease (IHD)	LGIS (Large group interactive session)
CV-P-021	• Discuss the signs and symptoms of: Hypertension. • Discuss the management of Hypertension.		Hypertension	LGIS (Large group interactive session)
CV-P- 022	• Enlist various valvular heart diseases. • Identify presentations and signs and symptoms of valvular heart diseases. • Outline management strategies		Valvular Heart Diseases	LGIS (Large group interactive session)
CV-P- 023	• Identify various pericardial diseases. • Identify presentations and signs and symptoms. • Outline management strategies	General Medicine/ Cardiology	Pericardial Diseases	LGIS (Large group interactive session)
CV-P- 024	• Identify various endocardial and myocardial diseases. • Identify presentations and signs and symptoms. • Outline management strategies	General Medicine/ Cardiology	Endocardial and myocardial diseases	LGIS (Large group interactive session)

CV-P- 025	• Define Peripheral arterial diseases. • Identify symptoms and signs of PAD. • Outline management strategies	General Medicine	Peripheral Arterial Diseases (PAD)	LGIS (Large group interactive session)
CV-P- 026	• Enlist various sites of venous thromboembolism. • Identify various symptoms and signs of DVT. • Identify various symptoms and signs of pulmonary embolism. • Outline management strategies	General Medicine, Surgery	Venous thrombo-embolism	LGIS (Large group interactive session)
CV-P- 027	• Identify the salient features of heart and great vessels on CT/ MRI • Discuss the principles of cardiac catheterization	Radiology	Imaging in CVS disorders	LGIS (Large group interactive session)
CV-P- 028	• Justify the clinical picture of superior mediastinum syndrome anatomically	Surgery	Superior mediastinum Syndrome	LGIS (Large group interactive session)
CV-P- 029	• Describe Fetal and neonatal circulation mentioning transitional neonatal circulation with it clinical implication	Pediatrics, Obgyn	Fetal circulation at Birth	LGIS (Large group interactive session)
CV-P-030	• Psychological basis of emotional fainting and its impact	Behavioral Sciences	Emotional fainting	LGIS (Large group interactive session)

PRACTICAL

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 10		MIT (Mode of information transfer)
	PHYSIOLOGY PRACTICALS	DISCIPLINE	TOPIC	
CV-P-031	• Record an electrocardiogram by correct lead placement and connections.	Medical Physiology	ECG	Practical/Demonstrations
CV-P-032	• Perform auscultation of chest to recognize normal heart sounds.		Heart Sounds	
CV-P-033	• Examine neck veins to determine Jugular Venous Pulse.		JVP	
CV-P-034	• Examine arterial pulse to recognize normal characteristics of pulse.		Arterial Pulse	

MEDICAL BIOCHEMISTRY

THEORY

CODE	SPECIFIC LEARNING OUTCOMES BIOCHEMISTRY	TOTAL HOURS = 30 DISCIPLINE	 TOPIC	MIT (Mode of information transfer)
CV-B-001	• Classify lipids.	Medical Biochemistry	Classification of lipids	LGIS (Large group interactive session) / Tutorials / SGD (Small Group Discussion)
CV-B- 002	• Discuss the biomedical functions & properties of lipids.	Medical Biochemistry	Functions of lipids & Properties of lipids	LGIS (Large group interactive session) / Tutorials / SGD (Small Group Discussion)/Presentations
CV-B- 003	• Classify fatty acids. Discuss the role of trans saturated, saturated, poly- and mono-unsaturated fatty acids in diet on lipid profile. • Discuss lipid peroxidation and its significance	Medical Biochemistry	Classification of fatty acids	LGIS (Large group interactive session) / Tutorials / SGD (Small Group Discussion)/Presentations
CV-B- 004	• Explain the biochemical and therapeutic roles of eicosanoids (prostaglandins, leukotrienes, thromboxane, and prostacyclin)	Medical Biochemistry	Eicosanoids	LGIS (Large group interactive session) / Tutorials / SGD (Small Group Discussion)/Presentations
CV-B- 005	• Describe the types, structure, and biomedical importance of Lipoproteins. • Discuss the synthesis, transport, and fate of Lipoproteins	Medical Biochemistry	Circulation Lipoproteins	LGIS (Large group interactive session) / Tutorials / SGD (Small Group Discussion)/Presentations
CV-B- 006	• Interpret the disorders associated with impairment of lipoprotein metabolism especially atherosclerosis and LDL oxidized	Medical Biochemistry	Hyperlipidemias	LGIS (Large group interactive session) / Tutorials / SGD (Small Group Discussion)/Presentations
CV-B- 007	• Describe the reactions of cholesterol biosynthesis and its regulation & fate. • Discuss Genetic basis of the Hypercholesterolemia	Medical Biochemistry	Cholesterol	LGIS (Large group interactive session) / Tutorials / SGD (Small Group

				Discussion)
CV-B- 008	• Describe enzymes with reference to: ◦ Active sites ◦ Specificity ◦ Catalytic ◦ Cofactor efficiency ◦ Coenzyme ◦ Holoenzyme ◦ Apoenzyme ◦ Prosthetic group ◦ Zymogens ◦ Location	Medical Biochemistry	Hypercholesterolemia	LGIS (Large group interactive session) / Tutorials / SGD (Small Group Discussion)/Presentations
CV-B- 009	• Classify enzymes according to the reaction they catalyze. • Explain the mechanism of enzyme action from reactants to products (catalysis). a) Illustrate enzyme kinetics in relation to MM Equation & Lineweaver- Burke plot • Discuss the effect of various factors (with special reference to Km/V max) on enzymatic activity. ◦ Substrate concentration Temperature ◦ PH ◦ Enzyme concentration	Medical Biochemistry	Enzymes	LGIS (Large group interactive session) / Tutorials / SGD (Small Group Discussion)
	• Explain the regulation of enzymatic activity. Compare allosteric regulation with regulation by covalent modification. Discuss the effect of inhibitors on enzymatic activity which includes: Competitive inhibition Uncompetitive inhibition • Interpret the effect of organophosphorus poisoning on enzyme activity on basis of given data			LGIS (Large group interactive session) / Tutorials / SGD (Small Group Discussion)/Presentations
	• Explain the application of enzyme in clinical diagnosis and therapeutic use	Integrate with Medicine/ Cardiology		LGIS (Large group interactive session)
CV-B- 010	• Discuss the signs and symptoms of hyperlipidemia. • Interpret data related to hyperlipidemia	Biochemistry / Medicine	Type I to V hyperlipidemias	LGIS (Large group interactive session) / Tutorials / SGD (Small Group Discussion)/Presentations

PRACTICAL

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 8		MIT (Mode of information transfer)
	BIOCHEMISTRY PRACTICALS	DISCIPLINE	TOPIC	
CV-B-011	• Perform estimation of Cholesterol by kit method	Medical Biochemistry	Cholesterol Estimation	Demonstration Performance
CV-B-012	• Perform estimation of HDL, LDL		HDL, LDL Estimation	Demonstration Performance
CV-B-013	• Estimation of cardiac markers		Cardiac Marker Estimation	Demonstration Performance
CV-B-014	• Interpret lab reports based on enzymes for diseases like cardiac disorders and hyperlipidemias		Interpretation of Lab report	Demonstration

PATHOPHYSIOLOGY AND PHARMACOTHERAPEUTICS

THEORY

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 4+7= 11		MIT (Mode of information transfer)
		DISCIPLINE	TOPIC	
CV-Ph-001	• Outline the pharmacological concepts of drugs used in hypertension.	Pharmacology & Therapeutics	Antihypertensive drugs	LGIS (Large group interactive session)
CV-Ph- 002	• Outline the pharmacological concepts of drugs used in angina.		Antianginal drugs	LGIS (Large group interactive session)
CV-Ph- 003	• Outline the pharmacological concepts of drugs used in arrythmias.		Antiarrhythmics drugs	LGIS (Large group interactive session)
CV-Ph- 004	• Outline the pharmacological concepts of drugs used in cardiac failure.		Drugs for cardiac failure	LGIS (Large group interactive session)
CV-Ph- 005	• Outline the pharmacological concepts of drugs used in peripheral vascular diseases.		Drugs for peripheral vascular diseases	LGIS (Large group interactive session)
CV-Pa- 001	• Classify types of thrombosis, embolism, and infarction	Pathology	Hemodynamics and CVS	LGIS (Large group interactive session)
CV-Pa- 002	• Discuss the pathophysiology of thrombosis, embolism, and infarction		Atherosclerosis	LGIS (Large group interactive session)
CV-Pa- 003	• Identify the types and causes of hypertension		Hypertension	LGIS (Large group interactive session)
CV-Pa- 004	• Discuss the pathophysiology of atherosclerosis, hypertension, and shock		Shock	LGIS (Large group interactive session)
CV-Pa- 005	• Discuss the clinical consequences of hypertension and atherosclerosis. • Classify the types of heart failure. • Identify the causes leading to heart failure		Cardiac Failure	LGIS (Large group interactive session)
CV-Pa- 006	• Identify the types of ischemic heart disease. • Discuss the pathophysiology of different types of ischemic heart disease		Ischemic Heart Disease	LGIS (Large group interactive session)

DISEASE PREVENTION AND IMPACT

THEORY

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 15		MIT (Mode of information transfer)
		DISCIPLINE	TOPIC	
CV-CM-001	• Describe the various strategies and models to prevent diseases.	Community Medicine and Public Health	Disease Prevention Models	LGIS (Large group interactive session)
CV-CM- 002	• Describe primordial prevention and its application to preventing CVS diseases. • Depict the concept of primary prevention in context to CVS and able to apply on CVS diseases.		Primordial Prevention	LGIS (Large group interactive session)
CV-CM- 003	• Discuss the basic concept of health promotion and its application to CVS.		Health Promotion	LGIS (Large group interactive session)
CV-CM- 004	• Discuss various methods of behavioral change interventions at community level.		Behavioral Change Intervention	LGIS (Large group interactive session)
CV-CM- 005	• To apply secondary and tertiary preventions on CVS diseases (coronary heart disease, ischemic heart disease, hypertension)		Secondary & Tertiary Prevention	LGIS (Large group interactive session)
CV-CM- 006	• Describe the concept of cardiovascular diseases as non-communicable diseases		Non- communicable disease	LGIS (Large group interactive session)
CV-CM- 007	• Identify the risk factors in the community for CVS diseases. • Learn and apply interventions to prevent the risk factors in community.		Risk factor assessment of CVS diseases	LGIS (Large group interactive session)
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	LGIS (Large group interactive session)

AGING

THEORY

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 5		MIT (Mode of information transfer)
		DISCIPLINE	TOPIC	
CV-Ag- 002	• Discuss the effect of age on blood vessels with reference to hypertension	Geriatrics/ Medicine/ Biochemistry	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	

RATIONALE OF RESPIRATORY-1 MODULE

The diseases related to the respiratory system are on the rise not only in developing countries but also in developed countries. The infant mortality rate in Pakistan is highest in Southeast Asia and one of the important reasons is common respiratory infections in children. With the world suffering from COVID-19 not only physically but also mentally, it is very important for medical students to study in detail the structures, functions, prevention, epidemiology, genetic basis of diseases and their management. The respiratory system is responsible for bringing oxygen into the body and removing carbon dioxide. It is made up of several organs and structures, including the nose, pharynx, larynx, trachea, bronchi, lungs, and diaphragm.

Module Outcomes

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

- Apply basic sciences' knowledge to understand the causes of common respiratory problems.
- Explain the pathogenesis of respiratory diseases.
- Enlist the main investigations relevant to respiratory disorders.
- Recognize risk factors and preventive measures of main respiratory diseases.

THEMES

- Rib cage
- Thoracic vertebrae Upper
- respiratory system
- Lower Respiratory system

Clinical Relevance

- Acute Respiratory Distress Syndrome Bronchial
- Asthma
- Tuberculosis
- Pneumonia

CURRICULUM OF INDIVIDUAL SUBJECTS

HUMAN ANATOMY

THEORY

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 30		MIT (Mode of information transfer)
	GROSS ANATOMY	DISCIPLINE	TOPIC	
Re-A-001	• Describe the anatomical features and neurovascular supply of nasal cavity. • Describe the anatomical features and neurovascular supply of pharynx. • Describe the anatomical features and neurovascular supply of larynx	Human Anatomy	Upper respiratory tract	SGD (Small group discussion)
Re-A- 002	• Describe the anatomical features of the Trachea with its extent, relations, neurovascular supply, and lymphatics.		Trachea	SGD (Small group discussion)
Re-A- 003	• Give the boundaries of thoracic cavity, superior and inferior thoracic apertures and list the structures contained/ traversing them.		Thoracic Cavity	SGD (Small group discussion)
	• Describe the anatomical correlates of Thoracic inlet syndrome & Thoracic outlet syndrome	Integrate with Surgery		LGIS (Large group interactive session)
Re-A- 004	• Identify and differentiate the typical from atypical ribs. • Describe the anatomical features of ribs and give their attachments.	Human Anatomy	Rib Cage	SGD (Small group discussion)
	• Describe the anatomical correlates of supernumerary cervical rib.	Integrate with Surgery		LGIS (Large group interactive session)
	• Classify the articulations of the ribs. • Describe the anatomical features of these articulations.	Human Anatomy		SGD (Small group discussion)
	• Describe the movements with the muscles producing articulations.			SGD (Small group discussion)
	• Describe the effects of fracture to the neck of rib and give its anatomical justification. • Describe the anatomical correlates of Flail Chest.	Integrate with Orthopedics		LGIS (Large group interactive session)
Re-A- 005	• Describe the anatomical correlates of Thoracotomy	Integrate with Surgery		LGIS (Large group interactive session)
	• Define the attachments, relations, nerve supply and actions of intercostal muscles. • Define an intercostal space and give details of its contents	Human Anatomy		SGD (Small group discussion)
	• Describe the anatomical correlates of intercostal incisions	Integrate with Surgery		LGIS (Large group interactive session)

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

	respiration. • Enumerate the diaphragmatic apertures with their vertebral levels, mentioning the structures traversing them.		Diaphragm	
Re-A- 013	• Describe the pleura giving its parts, layers, neurovascular supply, and lymphatic drainage. • Describe the pleural cavity giving its recesses and the lines of pleural reflection	Human Anatomy	Pleural cavity	LGIS (Large group interactive session)
	• Describe the anatomical correlates of pleural pain pleurisy, pneumothorax, pleural effusion	Integrate with Medicine		LGIS (Large group interactive session)
Re-A- 014	• Describe the neurovascular supply and lymphatic drainage of 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	Human Anatomy	Lungs	LGIS (Large group interactive session)
	• Describe the anatomical correlates of chest tube intubation. • Describe the anatomical correlates of thoracentesis	Integrate with surgery		LGIS (Large group interactive session)
	• Explain the pathophysiology of Atelectasis.	Integrate with pulmonology		LGIS (Large group interactive session)
	• Describe the anatomical correlates of bronchoscopy	Integrate with pulmonology		LGIS (Large group interactive session)
	• Describe the anatomical basis for medico-legal significance of lungs in determining the viability of newborn	Integrate with Forensic Medicine		LGIS (Large group interactive session)
	• Identify various anatomical landmarks on chest X-Rays, CT and MRI	Integrate with Radiology		LGIS (Large group interactive session)
EMBRYOLOGY & POST-NATAL DEVELOPMENT		**TOTAL HOURS = 6**		
CODE	**SPECIFIC LEARNING OBJECTIVES**	**DESCIPLINE**	**TOPIC**	**MIT (Mode of Information)**
Re-A- 015	• Describe the development of ribs, sternum, and thoracic vertebrae. Give the associated congenital malformations	Human Embryology	Bony components of thoracic cavity	LGIS (Large group interactive session)
Re-A- 016	• List the embryological sources of the diaphragm. Describe the events taking place in the development and descent of the diaphragm	Human Embryology	Diaphragm	LGIS (Large group interactive session)
	• Describe the embryological basis of congenital anomalies of the diaphragm: diaphragmatic hernias, eventuation of	Integrate with Pediatrics		LGIS (Large group interactive session)

	diaphragm, epigastric hernia, hiatal hernia, retrosternal hernia			
Re-A-017	• Describe the development of upper respiratory tract: larynx and trachea	Human Embryology	Upper respiratory tract	LGIS (Large group interactive session)
	• Describe congenital anomalies of larynx and trachea: laryngeal web, laryngeal atresia, tracheal stenosis, and atresia.	Integrate with Pediatrics		LGIS (Large group interactive session)
	• List the types of tracheo-esophageal fistulas. Describe their embryological basis and clinical presentation	Integrated with Surgery		LGIS (Large group interactive session)
Re-A- 018	• List the phases of lung development with their time periods. Describe the events taking place in each phase	Human Embryology	Lungs	LGIS (Large group interactive session)
	• Describe the embryological basis and clinical presentation of respiratory distress syndrome/Hyaline membrane disease.	Integrate with Pediatrics		LGIS (Large group interactive session)
CODE	**SPECIFIC LEARNING OBJECTIVES**	**DISCIPLINE**	**TOPIC**	**MIT (Mode of information)**
MICROSCOPIC ANATOMY (HISTOLOGY & PATHOLOGY)			**Total Hours = 4**	
Re-A- 019	• Give the general histological organization of respiratory system.	Histology	Organization of respiratory system	LGIS (Large group interactive session)
Re-A- 020	• Describe the microscopic and ultra-microscopic structure of respiratory epithelium		Respiratory epithelium	LGIS (Large group interactive session)
Re-A-021	• Describe the histology of blood-air barrier		Blood-air barrier	LGIS (Large group interactive session)
Re-A-022	• Describe the histological features of epiglottis and larynx		Epiglottis & larynx	LGIS (Large group interactive session)
Re-A-023	• Describe the histological features of trachea and lungs		Trachea and lungs	LGIS (Large group interactive session)
Re-A- 024	• Explain the histological basis of: ◦ Coughing ◦ Atelectasis ◦ Infant respiratory distress syndrome Diffuse alveolar damage. ◦ Lung carcinoma	Integrate with pathology	Clinical correlates	LGIS (Large group interactive session)

PRACTICAL

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 5		MIT (Mode of information transfer)
	HISTOLOGY	DISCIPLINE	TOPIC	
Re-A-025	• Identify, draw, and label the histologic sections of epiglottis and larynx.	Histology	Epiglottis& larynx	Laboratory Practical
Re-A-026	• Describe the histological features of bronchial tree: trachea, bronchi, bronchioles, alveoli		Trachea & Organization of respiratory system	Laboratory Practical
Re-A-027	• Identify, draw, and label the histological sections of bronchial tree: trachea, bronchi, bronchioles, alveoli, 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.		Bronchial tree & Lung	Laboratory Practical
Re-A- 028	• Describe, compare, and contrast the light and electron microscopic features of type I and type II pneumocytes		Pneumocytes	Laboratory Practical

MEDICAL PHYSIOLOGY

THEORY

CODE	SPECIFIC LEARNING OUTCOMES NORMAL ORGAN FUNCTIONS	TOTAL HOURS = 45 DISCIPLINE	 TOPIC	MIT (Mode of information transfer)
Re-P- 001	• Enlist the muscles of inspiration and expiration in quiet breathing. • Enlist the muscles of inspiration and expiration in labored breathing	Integrate with Anatomy	Breathing	LGIS (Large group interactive session)
	• Explain the components of the work of breathing. • Discuss the mechanics of pulmonary ventilation. • Explain periodic breathing	Medical Physiology		LGIS (Large group interactive session)
	• Explain the causes and pathophysiology of sleep apnea	Integrate with medicine		LGIS (Large group interactive session)
Re-P- 002	• Define 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	Medical Physiology	Lung Compliance	LGIS (Large group interactive session)
	• Explain the role of surfactant in premature babies	Integrate with Pediatrics		LGIS (Large group interactive session) PBL (Problem Based Learning)
Re-P- 003	• Define the different lung volumes and capacities and their clinical significance. • Discuss 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	Medical Physiology	Lung volumes and Capacities	LGIS (Large group interactive session)
	• Discuss FEV1/FVC ratio in relation to Bronchial Asthma. • Discuss FEV1/FVC ratio in relation to Chronic Obstructive Pulmonary disease/restrictive lung diseases	Integrate with Pulmonology		LGIS (Large group interactive session) SGD (Small Group Discussion)
Re-P- 004	• Define alveolar ventilation. • Define minute respiratory volume	Medical Physiology	Alveolar ventilation	LGIS (Large group interactive session)
Re-P- 005	• Explain the ultrastructure of respiratory membrane. • Discuss the factors affecting diffusion of gases across the respiratory membrane. • Explain the diffusion capacity of	Medical Physiology	Principles of gaseous exchange	LGIS (Large group interactive session)

	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- 006	• Explain the different forms of transport of oxygen in the blood. • Draw and explain oxyhemoglobin dissociation curve. • Enlist the factors that cause rightward shift of oxyhemoglobin dissociation curve. • Enlist the factors that cause leftward shift of oxyhemoglobin dissociation curve.	Medical Physiology	Transport of oxygen in the blood	LGIS (Large group interactive session) SGD (Small Group Discussion)
	• Define; enlist the types, and causes of cyanosis	Integrate with Medicine		LGIS (Large group interactive session)
Re-P- 007	• Enlist different forms in which CO2 is transported in the blood. • Explain the Carboxyhemoglobin dissociation curve. • Explain the Haldane effect. • Explain the chloride shift/Hamburger phenomenon. • Define the respiratory exchange ratio (RER)	Medical Physiology	Transport of CO2 in blood	LGIS (Large group interactive session) SGD (Small Group Discussion)
Re-P- 008	• Explain the alveolar oxygen and carbon dioxide pressure when VA/Q = infinity, zero and normal • Explain the concept of physiological shunt when VA/Q ratio is less than normal. • Explain the concept of physiological dead space when VA/Q ratio is above normal	Medical Physiology	VA/Q (Ventilation Perfusion Ratio)	LGIS (Large group interactive session)
Re-P- 009	• Enlist the respiratory & non-respiratory functions of lungs. • Explain the nervous control of bronchiolar musculature. • Trace the reflex arc of cough reflex and sneeze reflex	Medical Physiology	Protective Reflexes	LGIS (Large group interactive session)
Re-P- 010	• Explain the principal means by which acclimatization occurs. • Explain the events that occur during acute mountain sickness • Enlist the features of chronic mountain sickness	Medical Physiology	Aviation and Space	LGIS (Large group interactive session)
Re-P- 011	• Explain the pathophysiology, features, prevention, and treatment of decompression sickness.	Medical Physiology	Deep sea diving	LGIS (Large group interactive session) PBL (Problem Based Learning)
Re-P- 012	• Draw and explain the effect of CO poisoning on oxyhemoglobin dissociation	Medical Physiology		LGIS (Large group interactive session)

	curve		CO poisoning	
	• Explain the pathophysiology, features, and treatment of CO poisoning.	Integrate with medicine		LGIS (Large group interactive session) SGD (Small Group Discussion)
Re-P- 013	• Enumerate the components of respiratory centers and explain their functions.	Medical Physiology	Nervous regulation of respiration	LGIS (Large group interactive session)
	• Explain the inspiratory RAMP signal			LGIS (Large group interactive session)
	• Explain the Herring Breuer reflex/lung inflation reflex and its clinical significance			LGIS (Large group interactive session)
Re-P- 014	• Explain the location of chemo sensitive area (central chemoreceptors) and peripheral chemoreceptors	Medical Physiology	Chemical control of respiration	LGIS (Large group interactive session)
	• Explain the effect of hydrogen ions & carbon dioxide on the chemo- sensitive area			LGIS (Large group interactive session)
	• Explain the role of oxygen in the control of respiration/peripheral chemoreceptors			LGIS (Large group interactive session)
Re-P- 015	• Explain the regulation of Respiration during Exercise	Medical Physiology	Exercise and respiration	LGIS (Large group interactive session)
Re-P- 016	• Enlist the effects of acute hypoxia. • Explain the hypoxia inducible factor a masters switch for body response to hypoxia	Medical Physiology	Hypoxia	LGIS (Large group interactive session)
	• Define and explain different types of hypoxias	Integrate with Medicine		LGIS (Large group interactive session)
Re-P- 017	• Explain the pathophysiology of Tuberculosis.	Integrate with pathology	Tuberculosis	LGIS (Large group interactive session)
Re-P- 018	• Describe the pathophysiology of Pneumonia	Integrate with pathology	Pneumonia	LGIS (Large group interactive session)
Re-P- 019	• Define Dyspnea • Enlist different causes of dyspnea. • Differentiate between cardiac and respiratory dyspnea. • Outline management strategies for dyspnea	General Medicine	Dyspnea	LGIS (Large group interactive session)
Re-P- 020	• Enlist the causes of Pneumothorax. • Describe the signs and symptoms of Pneumothorax	Surgery	Pneumothorax	LGIS (Large group interactive session)
Re-P- 021	• Enlist the causes of Pleuritis. • Describe the signs and symptoms of Pleuritis. • Discuss the management of Pleuritis		Pleuritis	LGIS (Large group interactive session)
Re-P- 022	• Enlist the causes of Bronchitis. • Discuss the signs and symptoms of Bronchitis.		Bronchitis	LGIS (Large group interactive session)

	• Discuss the management of Bronchitis	General Medicine		
Re-P- 023	• Classify different types of pneumonia. • Discuss the sign symptoms of pneumonia. • Discuss the management of pneumonia		Pneumonia	LGIS (Large group interactive session)
Re-P- 024	• Classify different types of asthma. • Discuss the signs and symptoms of asthma. • Discuss the management of asthma		Asthma	LGIS (Large group interactive session) PBL (Problem Based Learning)
Re-P- 025	• Classify different types of Tuberculosis. • Discuss the signs and symptoms of tuberculosis. • Discuss the management of Tuberculosis		Tuberculosis	LGIS (Large group interactive session)
Re-P- 026	• Classify different types of acute respiratory distress syndrome. • Discuss the signs and symptoms of acute respiratory distress syndrome. • Discuss the management of acute respiratory distress syndrome	General Medicine	Acute respiratory distress syndrome	LGIS (Large group interactive session)
Re-P- 027	• Define respiratory failure. • Describe various types of respiratory failure. • Enlist various causes of respiratory failure. • Outline management strategies of respiratory failure	General Medicine	Respiratory Failure	LGIS (Large group interactive session)
Re-P- 028	• Describe ABC in a trauma patient	Surgery	First Aid in Surgical Patients	LGIS (Large group interactive session)

PRACTICAL

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 10		MIT (Mode of information transfer)
	PHYSIOLOGY PRACTICALS	DISCIPLINE	TOPIC	
Re-P-029	• Perform the clinical examination of chest for the respiratory system (inspection, palpation, percussion, Auscultation)	Medical Physiology	Clinical Examination of Chest	Practical/Demonstrations
Re-P-030	• Determine Peak Expiratory Flow rate with Peak Flow Meter		Peak Expiratory Flow rate measurement	
Re-P-031	• Determine Blood Oxygen Saturation with finger Pulse Oximeter		Oxygen Saturation	
Re-P-032	• Determine Respiratory Volumes & Capacities with Spirometer/ Spiro lab. (FEV1/FVC ratio)		Spirometry	
Re-P-033	• Student should be able to Record the movements of chest by stethograph		Chest movements	

MEDICAL BIOCHEMISTRY

THEORY

CODE	SPECIFIC LEARNING OUTCOMES BIOCHEMISTRY	TOTAL HOURS = 30 DISCIPLINE	 TOPIC	MIT (Mode of information transfer)
Re-B- 001	• Explain and interpret the pedigree of single gene defect i.e., Emphysema and cystic fibrosis (autosomal recessive)	Medical Biochemistry	Genetic defects	LGIS (Large group interactive session) / Tutorials / SGD (Small Group Discussion)/Presentations
Re-B- 002	• Explain the biochemical significance of phospholipids	Medical Biochemistry	Phospholipids	LGIS (Large group interactive session) / Tutorials / SGD (Small Group Discussion)/Presentations
	• Interpret Respiratory Distress syndrome based on given data	Integrate with Physiology		
Re-B- 003	• Describe the structure, synthesis, degradation, and functions of Elastin	Medical Biochemistry	Elastin	LGIS (Large group interactive session)
	• Discuss the pathophysiology of Emphysema.	Integrate with Pathology		
Re-B- 004	• Discuss the concept of acid base balance. • Interpret metabolic and respiratory disorders of acid base balance based on sign, symptoms and ABG findings	Medical Biochemistry	Acid base balance	LGIS (Large group interactive session) / Tutorials / SGD (Small Group Discussion)/Presentations
	• Describe the Clinical interpretation of acid base balance	Integrate with Medicine		

PRACTICAL

CODE	SPECIFIC LEARNING OUTCOMES BIOCHEMISTRY PRACTICALS	TOTAL HOURS = 8 DISCIPLINE	 TOPIC	MIT (Mode of information transfer)
Re-B- 005	• Determine the pH of the solution by pH meter	Medical Biochemistry	Determination of pH	Demonstration Performance

PATHOPHYSIOLOGY AND PHARMACOTHERAPEUTICS

THEORY

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 4+7= 11		MIT (Mode of information transfer)
		DISCIPLINE	TOPIC	
Re-Ph- 001	• Identify the drugs for cough suppression & expectoration. • Explain the mechanism of action and adverse effects of cough suppressants	Pharmacology & Therapeutics	Cough Suppressants	LGIS (Large group interactive session)
Re-Ph- 002	• Explain the mechanism of action and adverse effects of antihistamines		Antihistamines	LGIS (Large group interactive session)
Re-Ph- 003	• Explain the mechanism of action and adverse effects of anti-asthmatics		Anti- asthmatics	LGIS (Large group interactive session)
Re-Pa- 001	• Describe the pathophysiology of acute respiratory distress syndrome	Pathology	Acute Respiratory Distress Syndrome	LGIS (Large group interactive session)
Re-Pa- 002	• Describe the pathophysiology of obstructive lung disease		Obstructive lung Disease	LGIS (Large group interactive session)
Re-Pa- 003	• Describe the pathophysiology of Restrictive Lung Disease		Restrictive Lung Disease	LGIS (Large group interactive session)

DISEASE PREVENTION AND IMPACT

THEORY

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 15		MIT (Mode of information transfer)
		DISCIPLINE	TOPIC	
Re-CM-001	• Identify the common risk factors of acute respiratory infections with emphasis on smoking. • Discuss preventive strategies of different problems related to respiratory system. • Enlist the common vaccines used for the prevention of ARI	Community Medicine and Public Health	Prevention of acute respiratory infections (ARI)	LGIS (Large group interactive session)
	• Explain the role of vitamins in the respiratory tract infections	Integrate with Biochemistry		LGIS (Large group interactive session)
Re-CM- 002	• Explain the effect of air pollutants on the respiratory system	Community Medicine And Public Health	Interaction of environment & Respiratory system	LGIS (Large group interactive session)
Re-CM- 003	• Describe the burden of respiratory diseases		Epidemiology of respiratory diseases	LGIS (Large group interactive session)
Re-CM- 004	• Enlist the common respiratory diseases related to occupation		Occupational Lung Diseases	LGIS (Large group interactive session)
Re-BhS -001	• Identify the psychosocial factors leading to dyspnea.	Behavioral sciences	Dyspnea	LGIS (Large group interactive session)
Re-BhS- 002	• Identify the psychosocial factors leading to psychogenic cough.		Psychogenic cough	LGIS (Large group interactive session)
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	LGIS (Large group interactive session)

AGING

THEORY

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 5		MIT (Mode of information transfer)
		DISCIPLINE	TOPIC	
Re-Ag- 001	• Discuss the effect of age on decreased lung compliance	Pathology	Age-induced lung fibrosis	LGIS (Large group interactive session)
Re-Ag- 002	• Discuss the role of age on respiratory clearance leading to recurrent inflammatory processes at the ciliated respiratory epithelium		Increased vulnerability to infection & neoplasia	LGIS (Large group interactive session)

PERLs (PROFESSIONALISM, ETHICS, RESEARCH, LEADERSHIP)

CODE	SPECIFIC LEARNING OUTCOMES	DOMAIN	ATTRIBUTE	TOPIC	PORTFOLIO ENTRY	MIT
PERLs- 1-17	Demonstrate patience and tolerance	Leadership	Resilient and Adaptable	Tolerance Patience Role of emotional regulation Giving feedback	Teacher feedback	LGIS (Large group interactive session)
PERLs- 1-18	Demonstrate healthy coping mechanisms to respond to stress	Leadership	Resilient and Adaptable	Stress Coping mechanisms	Self or peer evaluation	LGIS (Large group interactive session)
PERLs- 1-19	Developing an argument	Professionalism	Communicator	Structure of an argument Validity of an argument	Write an argument	LGIS (Large group interactive session)
PERLs- 1-20	Identify and seek help as and when required to achieve the set goals	Leadership	Self-directed learner	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	LGIS (Large group interactive session)

CLINICAL SKILLS (C-FRC)

CODE	Early Clinical Exposure	Total Hours = 15		MIT (Mode of Information Transfer)
	SPECIFIC LEARNING OBJECTIVES	TOPIC	LOGBOOK ENTRIES	
C-CVS-1-01	Perform Articulatation heart sounds	Heart Sounds	3	Skills Lab / Demonstration / Bedside Teaching
C-CVS-1-02	Examine for ankle swelling/edema-pitting/non-pitting	Edema	3	Skills Lab / Demonstration / Bedside Teaching
C-CVS-1-03	Examine abdominal jugular reflex	JVP	3	Skills Lab / Demonstration / Bedside Teaching
C-CVS-1-04	Identify main organs of the thoraxon CXR	CXR	3	Skills Lab / Demonstration / Bedside Teaching
C-CVS-1-05	Perform detection of pedal and carotid pulses	Pedal and carotid pulse	2	Skills Lab / Demonstration / Bedside Teaching
C-CVS-1-06	Perform cervical and axillary node examination	Lymph node Examination	3	Skills Lab / Demonstration / Bedside Teaching
C-RS-1-01	Perform Auscultation the chest	Chest Sounds	3	Skills Lab / Demonstration / Bedside Teaching
C-RS-1-02	Examine for clubbing	Clubbing	2	Skills Lab / Demonstration / Bedside Teaching
C-RS-1-03	Examine ABGs	ABGs	2	Skills Lab / Demonstration / Bedside Teaching
C-RS-1-04	Identify pneumonic Patchon chest x-ray	Pneumonia CXR	2	Skills Lab / Demonstration / Bedside Teaching
C-RS-1-05	Identify COPD on chest X-ray	COPD CXR	1	Skills Lab / Demonstration / Bedside Teaching
C-RS-1-06	Administer an inhaler to a patient	Inhaler Use	2	Skills Lab / Demonstration / Bedside Teaching

HOLY QURAN AND ISLAMIYAT

CODE	The Holy Quran	Total Hours = 04		PORTFOLIO ENTRY	MIT (Mode of Information Transfer)
	SPECIFIC LEARNING OUTCOMES	DESCIPLINE	TOPIC		
QI-004	• Recognize the importance of physical purity (Taharah) • Discuss the philosophy of prayer and its role in purification of soul. • Recognize the importance of prayer in building personal character - sense of duty, patience, perseverance, punctuality, and self/social discipline. • Spiritual, moral, and social impact of prayer in building of righteous community • Role in creating brotherhood, equality, and unity in ummah. • Identify the conditions in which relaxation in prayer is allowed e.g. during operation, travelling etc.	WORSHIP (IBADAAT)	Prayer (Namaz)	One reflective writing One class quiz	LGIS (Large group interactive session)
QI-005	• Identify obligatory importance of Zakat and other items as outlined under the title of 'lnfaq-fee-sabilillah' • Categorize the people who can be the beneficiaries of Zakat. • Role of zakat in eradication of greed and love of material world • Effect of Zakat and sadaqat in circulation of wealth and alleviation of poverty • Explain the essence of zakat and sadaqat in building just communities. • Describe the role of state in collection and disbursement of zakat		Obligatory Charity (Zakat)		LGIS (Large group interactive session)
QI-006	• Discuss the importance and significance of fasting. • Relate the Holy Quran and the month of Ramadan. • Role of fasting in building personal qualities like self-control, piety and soft corner for the poor and needy persons • Identify the applications of "Taqwa" through fasting		Fasting (Roza)		LGIS (Large group interactive session)

QI-007	• Discuss the importance and significance of Hajj. • Identify the conditions in which Hajj becomes an obligation. • Role of manasik-e-Hajj in producing discipline and complete submission • Recognize the importance of Hajj in uniting the ummah. • Sacrifice for Allah subhan wa taala (essence of qurbani)		Pilgrimage (Hajj)		LGIS (Large group interactive session)

CIVICS (FOR STUDENTS OTHER THAN MUSLIMS)

CODE	SPECIFIC LEARNING OUTCOMES	DISCIPLINE	TOPIC	PORTFOLIO ENTRY	MIT (Mode of Information Transfer)
C-006	• Identify the basic unit of social institution Discuss and characterize the different types of family. • Give the importance of basic unit of social institution in the development of a state Enlist the responsibilities of family in general. • 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.	Civics		One reflective writing One class quiz	LGIS (Large group interactive session)
C-007 C-008	• Define community. • Explain the nature and significance of community Discuss the role of a family in community. • Analyze the role of an individual for the betterment of the community. • Define society. • Elaborate the relation between an individual and society and society and state. • Analyze the role of an individual for the betterment of society		Community Society		LGIS (Large group interactive session)
C-009	• 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. • evaluate the characteristics of society developed by religions		Nation, Nationality		LGIS (Large group interactive session)

C-010	• Trace the origin of state with reference to the theories of Divine Origin, Force and Social Contract (Hobbs, Lock, Rousseau) • Describe the elements of a state (sovereignty, population, territory, Government) • Compare and distinguish the role of state, society and government		Origin and elements of State		LGIS (Large group interactive session)
C-011	• Describe the functions of state. • Describe the factors which are necessary for proper functioning of state. • Analyze the situation when a state does not function properly. • 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.)		LGIS (Large group interactive session)
C-012	• Define the concept of sovereignty in west Discuss different kinds of sovereignty. • Explain, Austin's concept of sovereignty		Sovereignty		LGIS (Large group interactive session)

PAKISTAN STUDIES

CODE	SPECIFIC LEARNING OUTCOMES	DISCIPLINE	TOPIC	PORTFOLIO ENTRY	MIT (Mode of Information Transfer)
P-006 P-007	• Explain current problems faced by Pakistan. • Describe the social, economic and health problems of the rural population of Pakistan.	Pakistan Studies	Current Situation of Pakistan	One reflective writing One class quiz	LGIS (Large group interactive session)

ASSESSMENT STRATEGIES

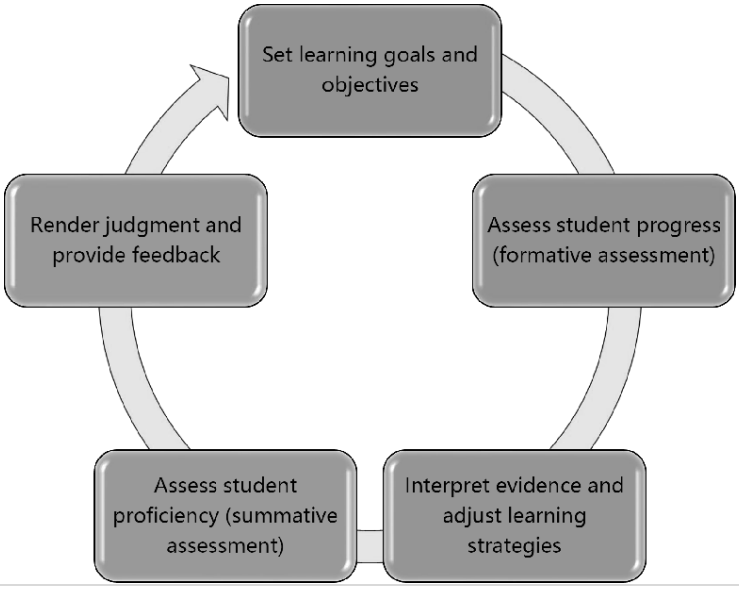
As assessment drives learning, assessment tools need to be in alignment with the domains of learning and instructional strategies. Both formative and summative assessments are encouraged. Formative assessments will be those written and practical tests whose weightage will not be included in the internal assessments. The summative assessment will comprise of internal assessment and professional examination. The weightage of internal assessment is 20% while that of professional examination is 80%.

Assessment tools for Theory

- Multiple Choice Questions (MCQ)
- Structured Essay Questions (SEQ)
- Reflective paper
- Assignment
- Presentation

Assessment tools for Practical, Clinical and Human (soft) skills

- Objective Structured Practical Examination
- Objective Structured Clinical Examination
- Structured Viva
- Short Case
- Long Case
- Logbook
- Portfolio
- Feedback (simple and/or 360 degree)



The marks distribution in each subject is given in Table.

Table 1

Subject	Theory		Practical		Total
Block 1 (Foundation+ Hematopoietic and Lymphatic Modules)	Part I MCQs Part II SEQS	85 Marks 35Marks	Oral and Practical/ Clinical Examination	120 Marks	**300**
	Internal Assessment	30 Marks	Internal Assessment	30 Marks	
		150		**150**	
Block 2 (Musculoskeletal & Locomotion Module)	Part I MCQs Part 11 SEQS	85 Marks 35Marks	Oral and Practical/ Clinical Examination	120 Marks	**300**
	Internal Assessment	30 Marks	Internal Assessment	30 Marks	
		150		**150**	
Block 3 (CVS & Respiratory)	Part I MCQs Part 11 SEQS	85 Marks 35Marks	Oral and Practical/ Clinical Examination	120 Marks	**300**
	Internal Assessment	30 Marks	Internal Assessment	30 Marks	
		150		**150**	
				Total	**900**
***Islamic Studies/ Ethics and Pakistan Studies**		**Islamic Studies/Ethics** 3 LEQs to be attempted out of 5 LEQs		60 Marks	
		Pakistan Studies 2 LEQs to be attempted out of 4 LEQs		40 Marks	
				100	

Cardiovascular Module Total Hours=200

Anatomy=35	Community Medicine=15
Physiology=85	PERLs=3.25
Biochemistry=40	Islamiat/ Pak. Studies=3
C-FRC= 4.5	Pharmacology=5
Pathology=5	Aging=5

Respiratory Module Total Hours=148

Anatomy=46	Community Medicine=10
Physiology=54	PERLs=1.5
Biochemistry=16.5	Islamiat/ Pak. Studies=3
SDL=1.5	Pharmacology=5
C-FRC= 4.5	Aging=3
Pathology=3	

RESOURCE BOOKS

Anatomy

- Moore K.L. Clinically Oriented Anatomy. Baltimore, U.S.A. Williams, and Wilkins:
- The Developing Human by K.L. Moore.
- Snell's Clinical Neuroanatomy.
- Laiq H.S. Medical Histology. Paramount Books.

Physiology

- Guyton AC and Hall JE. Textbook of Medical Physiology. W. B. Sunders & Co., Philadelphia.

Biochemistry

- Champe, P.C. & Harvey, E.A. Biochemistry (Lippincott's Illustrated
- Robert K. Murray, Daryl K. Granner, Peter A. Mayes, Victor W. Rodwell. Harper's Biochemistry. McGraw-Hill.
- ABC of Clinical genetics by H.M. Kingston.

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 andCotran, Pocket Companion to Pathologic basis of diseases. Saunder Harcourt.
- Walter and Israel. General Pathology. Churchill Livingstone.

Pharmacology

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

Behavioral Sciences

- Handbook of Behavioral Sciences by Prof. Mowadat H. Rana, 3rd Edition
- Integrating Behavioral Sciences in Healthcare by Asma Humayun & Michael Herbert.

Community medicine

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

lslamiyat/Pakistan studies Books

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