Department of Medical Education (DME)

Cardiovascular System Module

Study Guide
First Year MBBS 2022 - 2023

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Prepared By	Reviewed By	Approved By
Additional Director Medical Education, Asst. Director Medical Education,	Curriculum Committee	Vice Chancellor

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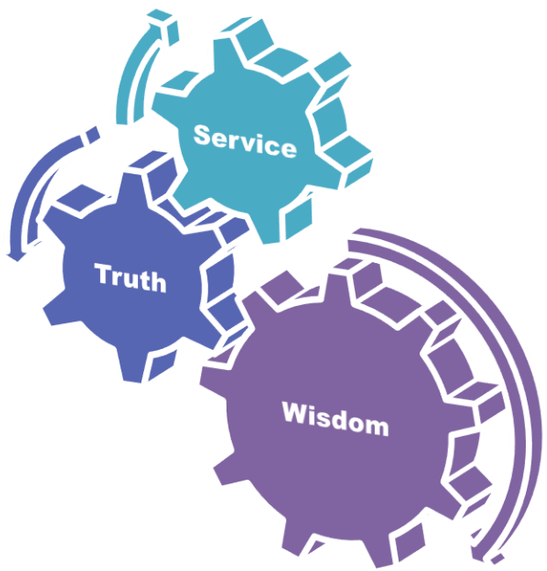
University Moto, Vision, Values & Goals

RMU Motto



Mission Statement

To impart evidence-based research-oriented health professional education in order to provide best possible patient care and inculcate the values of mutual respect, ethical practice of healthcare and social accountability.

Vision and Values

Highly recognized and accredited centre of excellence in Medical Education, using evidence-based training techniques for development of highly competent health professionals, who are lifelong experiential learner and are socially accountable.

Goals of the Undergraduate Integrated Modular Curriculum

The Undergraduate Integrated Learning Program is geared to provide you with quality medical education in an environment designed to:

- Provide thorough grounding in the basic theoretical concepts underpinning the practice of medicine.
- Develop and polish the skills required for providing medical services at all levels of the Health care delivery system.
- Help you attain and maintain the highest possible levels of ethical and professional conduct in your future life.
- Kindle a spirit of inquiry and acquisition of knowledge to help you attain personal and professional growth & excellence.

First Year MBBS 2023

Study Guide

CVS Module

Discipline wise Details of Modular Content

Block	Module	General Anatomy	Embryology	Histology	Gross Anatomy
II1	• Anatomy	• Heart & Vessels	• Cardiovascular System	• Heart & Vessels	Mediastinum, Heart, Great Vessels
	• Biochemistry	• Carbohydrate chemistry, Lipid chemistry			
	• Physiology	• The Heart as a Pump and Function of the Heart Valves& regulation of heart pumping, cardiac cycle • Rhythmical Excitation of the Hear &Specialized excitatory&conductive system of the heart & its control (revisit) • Electrocardiogram, its interpretation & its abnormalities • Medical Physics of Pressure, Flow, and Resistance, Vascular Distensibility and Functions of the Arterial and Venous Systems • Microcirculation and the Lymphatic System, Local and Humoral Control of Blood Flow by the Tissues • Nervous Regulation of the Circulation, and Rapid & Long-Term Control of Arterial Pressure, hypertension • Cardiac Output, Venous Return, and Their Regulation • Muscle Blood Flow and Cardiac Output During Exercise; the Coronary & regional circulation • Cardiac Failure, Circulatory Shock • Heart Valves and Heart Sounds; Dynamics of Valvular and Congenital Heart Defects			
	• Behavioural Sciences, Bioethics & Professionlism	• Breaking the bad news • Stigma to mental illness			
	• Radiology, Artificial Inteligence & Innovation	• Chest radiograph with perspective of cardiovascular system • Radiology with perspective of Artificial Intelligence & Innovation.			
	• Family Medicine	• Approach to a patient with chest pain			
	• Research	• Researh Club Activity (Synopsis writing)			
	• Vertical components	• The Holy Quran Translation Component			
	• Vertical Integration	Clinically content relevant to CVS module • Risk factors of coronary vascular disease (Community Medicine) • Breaking bad news (Behavior Sciences) • DME orientation/paper discussion (DME) • Thrombosis & Infarction (Pathology) • Approach to a patient with chest pain (Family Medicine) • Hypertensive retinopathy (Eye) • ECG Changes (MI, Electrical Imbalance, Myocardial hypertrophy) (Medicine) • Overview of acute coronary syndrome & management of heart failure & management of shock (Medicine) • Hypertension (Medicine) • Clinical pharmacology of antihypertensive drugs (Pharmacology) • Cardiovascular changes in pregnancy (Gynae & Obs)			

Table of Contents

University Moto, Vision, Values & Goals 7
Discipline wise Details of Modular Content 9
CVS Module Team 13
Module V – CVS Module 14
Module Outcomes 14
Knowledge: 14
Skill: 14
Attitute: 14
SECTION - I 15
Terms & Abbreviations 15
Teaching and Learning Methodologies / Strategies 17
Large Group Interactive Session (LGIS) 17
Small Group Discussion (SGD) 18
Self Directed Learning (SDL) 20
Case Based Learning (CBL) 20
Problem Based Learning (PBL) 20
Practical Sessions/Skill Lab (SKL) 21
SECTION – II 22
Learning Objectives, Teaching Strategies & Assesssments 22
Horizontally Integrated Basic Sciences (Anatomy, Physiology & Biochemistry) 23
Anatomy Large Group Interactive Session (LGIS) 23
Physiology Large Group Interactive Session (LGIS) 25
Biochemistry Large Group Interactive Session (LGIS) 34

Anatomy Small Group Discussion (SGDs) 36
Physiology Small Group Discussion (SGDs) 38
Biochemistry Small Group Discussion (SGDs) 39
Anatomy Self Directed Learning (SDL) 40
Physiology Self Directed Learning (SDL) 43
Biochemistry Self Directed Learning (SDL) 50
Histology Practicals Skill Laboratory (SKL) 51
Physiology Practicals Skill Laboratory (SKL) 52
Biochemistry Practicals Skill Laboratory (SKL) 53
SECTION - III 54
Basic and Clinical Sciences (Vertical Integration) 54
Basic and Clinical Sciences (Vertical Integration) 55
Case Based Learning (CBL) 55
Large Group Interactive Sessions (LGIS) 55
Pathology 55
Medicine 56
Surgery 57
Obstetrics & Gynaecology 58
Peadiatrics 59
Eye 59
Behavioral Sciences & Biomedial Ethics 59
Radiology 60
Integrated Undergraduate Research Curriculum (IUGRC) 60
Family Medicine 61

SECTION - IV 62
Assessment Policies 62
Types of Assessment: 64
Modular Assessement 64
Block Assessement 64
Learning Resources 66
SECTION - V 67
Time Table 67
CVS Module Team 69
Categorization of Modular Contents 70
Teaching Staff / Human Resources of Department of Anatomy 72
Physiology 73
Teaching Staff / Human Resource of Department of Physiology 76
Biochemistry 77
SECTION VI 88
Table of Specification (TOS) For CVS Module Examination 88
Annexure I 89
(Sample MCQ, & SEQ Papers) 89

CVS Module Team

Module Name	:	CVS Module
Duration of module	:	05 Weeks
Coordinator	:	Dr. Aneela Yasmeen
Co-Coordinator	:	Dr. Sheena Tariq
Reviewed by	:	Module Committee

Module Committee		
1.	Vice Chancellor RMU	Prof. Dr. Muhammad Umar
2.	Director DME	Prof. Dr. Rai Muhammad Asghar
3.	Convener Curriculum	Prof. Dr. Naeem Akhter
4.	Dean basic sciences and Chairperson Anatomy	Prof Dr. Ayesha Yousaf
5.	Additional Director DME	Prof. Dr. Ifra Saeed
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8.	Focal Person Anatomy	Prof Dr. Ayesha Yousaf
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11.	Focal Person Pharmacology	Dr. Zunera Hakim
12.	Focal Person Medicine	Dr Madiha Nazar
13.	Focal Person Pathology	Dr. Asiya Niazi
14.	Focal Person Behavioral Sciences	Dr. Saadia Yasir
15.	Focal Person Community Medicine	Dr. Afifa Kulsoom
16.	Focal Person Quran Translation Lectures	Dr. Fahad Anwar

Module Task Force Team		
1.	Coordinator	Dr. Aneela Yasmeen Senior demonstrator physiology
2.	Co-coordinator	Dr. Kashif Senior Demonstrator of Biochemistry
3.	DME Focal person	Dr. Sidra Hamid Assistant Professor Physiology
4.	Co-coordinator	Dr. Ali Raza Demonstrator of Anatomy
5.	Co-coordinator	Dr. Sheena Tariq APWMO of Physiology

DME Implementation Team		
1.	Director DME	Dr. Rai Muhammad Asghar
2.	Deputy Director DME	Dr. Shazia Zeb
3.	Implementation Incharge 1st&2nd Year MBBS	Prof. Dr. Ifra Saeed
4.	Module planner & implementation coordinator	Dr. Sidra Hamid
5.	Editor	Muhammad Arslan Aslam

Module V – CVS Module

Rationale: The main role of the cardiovascular system in the body is to transport oxygen to all tissues in the body and for removing, from these same tissues, metabolic waste products. The system itself consists of the blood, the medium for exchanging oxygen, nutrients and waste products throughout the body, the blood vessels, the pipes through which the blood flows and the heart, the pump which forces blood to flow through the blood vessels.

Cardiovascular health is important in maintaining overall health and wellness. This module will teach how heart and cardiovascular system work when healthy, and what happens when diseased. We will explore through lectures, SGDs and skill lab normal anatomy, physiology, biochemistry of CVS. This module will briefly discuss the common CVS diseases & their prevention, therapeutic drug treatment, behavioral aspects, radiological findings.

Module Outcomes

At the end of this module the student should be able to:

Knowledge:

1. Explain the structural & developmental organization of CVS.
2. Explain different waves, segment and intervals of ECG and apply it to the interpretation of ECG.
3. Use technology based medical education including
   Artifical Intelligence.
4. Appreciate concepts & importance of
   Family Medicine
   Biomedical Ethics
   Research

Skill:

1. Understand the physiology of conductive system of heart, cardiac cycle.
2. Must understand the pathophysiology of edema, infarction, shock and thrombosis.

Attitute:

- Demonstrate **Professional Attitude, Team-Building Spirit and Good Communication Specially in Small Group Discussions.**

SECTION - I

Terms & Abbreviations

Contents

- Domains of Learning
- Teaching and Learning Methodologies/Strategies
    - Large Group Interactive Session (LGIS)
    - Small Group Discussion (SGD)
    - Self-Directed Learning (SDL)
    - Case Based Learning (CBL)
    - Problem- Based Learning (PBL)
    - Skill Labs/Practicals (SKL)

Tables & Figures

- Table1. Domains of learning according to Blooms Taxonomy
- Figure 1. Prof Umar's Model of Integrated Lecture
- Table2. Standardization of teaching content in Small Group Discussions
- Table 3. Steps of taking Small Group Discussions
- Figure 2. PBL 7 Jumps Model

Table1. Domains of Learning According to Blooms Taxonomy

Sr. #	Abbreviation	Domains of learning
1.	C	**Cognitive Domain:** knowledge and mental skills.
	• C1	Remembering
	• C2	Understanding
	• C3	Applying
	• C4	Analyzing
	• C5	Evaluating
	• C6	Creating
2.	P	**Psychomotor Domain:** motor skills.
	• P1	Imitation
	• P2	Manipulation
	• P3	Precision
	• P4	Articulation
	• P5	Naturalization
3.	A	**Affective Domain:** feelings, values, dispositions, attitudes, etc
	• A1	Receive
	• A2	Respond
	• A3	Value
	• A4	Organize
	• A5	Internalize

Teaching and Learning Methodologies / Strategies

Large Group Interactive Session (LGIS)

The large group interactive session is structured format of Prof Umar Model of Integrated lecture. It will the followed for delivery of all LGIS. The lecturer will introduce a topic or common clinical condition and explains the underlying phenomena through questions, pictures, videos of patients, interviews and exercises, etc. Students are actively involved in the learning process.

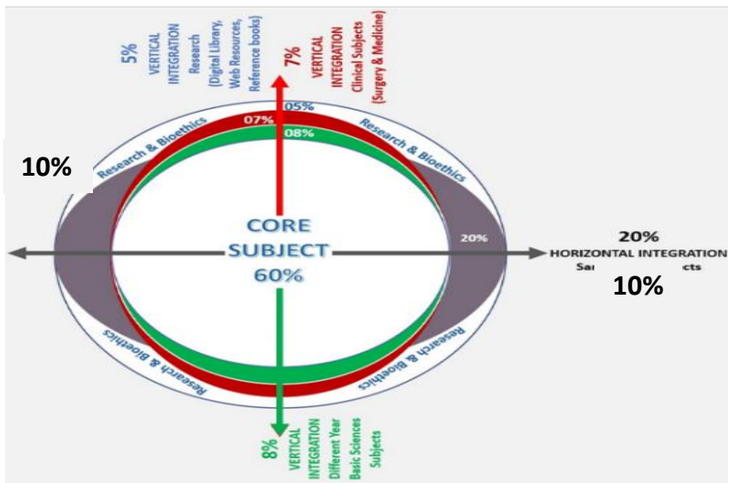


Figure 1. Prof Umar's Model of Integrated Lecture

Small Group Discussion (SGD)

This format helps students to clarify concepts acquire skills and attitudes. Sessions are structured with the help of specific exercises such as patient case, interviews or discussion topics or power point presentations. Students exchange opinions and apply knowledge gained from lectures, SGDs and self study. The facilitator role is to ask probing questions, summarize and help to clarify the concepts.

Table 2. Standardization of teaching content in Small Group Discussions

S. No	Topics	Approximate %
1	Title Of SGD	
2	Learning Objectives from Study Guides	
3	Horizontal Integration	5%+5%=10%
4	Core Concepts of the topic	60%
5	Vertical Integration	20%
6	Related Advance Research points	3%
7	Related Ethical points	2%

Table 3. Steps of Implementaion of Small Group Discussions

Step 1	Sharing of Learning objectives by using students Study guides	First 5 minutes
Step 2	Asking students pre-planned questions from previous teaching session to develop co-relation (these questions will be standardized)	5minutes
Step 3	Students divided into groups of three and allocation of learning objectives	5minutes
Step 4	ACTIVITY: Students will discuss the learning objectives among themselves	15 minutes
Step 5	Each group of students will present its learning objectives	20 min
Step 6	Discussion of learning content in the main group	30min
Step 7	Clarification of concept by the facilitator by asking structured questions from learning content	15 min
Step 8	Questions on core concepts	
Step 9	Questions on horizontal integration	
Step 10	Questions on vertical integration	
Step 11	Questions on related research article	
Step 12	Questions on related ethics content	
Step 13	Students Assessment on online MS teams (5 MCQs)	5 min
Step 14	Summarization of main points by the facilitator	5 min
Step 15	Students feedback on the SGD and entry into log book	5 min
Step 16	Ending remarks	

Self Directed Learning (SDL)

- Self- directed learning is a process where students take primary charge of planning, continuing, and evaluating their learning experiences.
- Time Home assignment
- Learning objectives will be defined
- Learning resources will be given to students = Textbook (page no), web site
- Assessment:

  i Will be online on LMS (Mid module/ end of Module)

  ii.OSPE station

Case Based Learning (CBL)

- It's a learner centered model which engages students in discussion of specific scenarios that typically resemble real world examples.
- Case scenario will be given to the students
- Will engage students in discussion of specific scenarios that resemble or typically are real-world examples.
- Learning objectives will be given to the students and will be based on
  i. To provide students with a relevant opportunity to see theory in practice
  ii. Require students to analyze data in order to reach a conclusion.
  iii. Develop analytic, communicative, and collaborative skills along with content knowledge.

Problem Based Learning (PBL)

- Problem-based learning (PBL) is a student-centered approach in which students learn about a subject by working in groups to solve an open-ended problem.
- This problem is what drives the motivation and the learning.

The 7- Jump-Format of PBL (Masstricht Medical School)	
Step 7	Syntheise & Report
Step 6	Collect Information from outside
Step 5	Generate learning Issues
Step 4	Discuss and Organise Ideas
Step 3	Brainstorming to Identify Explanations
Step 2	Define the Problem
Step 1	Clarify the Terms and Concepts of the Problem Scenario
Problem- Scenario	

Figure 2. PBL 7 Jumps Model

Practical Sessions/Skill Lab (SKL)

Practical Session/ Skill Lab (SKL)	
Demonstration/ power point presentation 4-5 slide	10-15 minutes
Practical work	25-30 minutes
Write/ draw and get it checked by teacher	20-25 minutes
05 mcqs at the end of the practical	10 minutes
At the end of module practical copy will be signed by head of department	
At the end of block the practical copy will be signed by Head of Department Dean Medical education department QEC	

SECTION – II

Learning Objectives, Teaching Strategies & Assesssments

Contents

- Horizontally Integrated Basic Sciences (Anatomy, Physiology & Biochemistry)
- Large Group Interactive Session:
  - Anatomy (LGIS)
  - Physiology (LGIS)
  - Biochemistry (LGIS)
- Small Group Discussions
  - Anatomy (SGD)
  - Physiology (SGD)
  - Biochemistry (SGD)
- Self Directed Topic, Learning Objectives & References
  - Anatomy (SDL)
  - Physiology (SDL)
  - Biochemistry (SDL)
- Skill Laboratory
  - Anatomy
  - Physiology
  - Biochemistry

Horizontally Integrated Basic Sciences (Anatomy, Physiology & Biochemistry)

Anatomy Large Group Interactive Session (LGIS)

Topic	Learning Objectives At The End Of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
General Anatomy				
General Anatomy of CVS (General Organization)	• Describe general organization of cardiovascular system	C2	LGIS	MCQ SAQ VIVA
	• Describe different types of circulations	C2		
	• Discuss general structural patterns of arteries and veins	C2		
	• Classify capillaries	C1		
	• Explain bio - functional importance and location of continuous, fenestrated and sinusoidal capillaries	C2		
	• Discuss related clinicals	C3		
	• How to access HEC digital library	C3		
	• How to read relevant research article	C3		
General Anatomy of CVS (Classification of vessels)	• Classify arteries on the basis of function and size	C1	LGIS	MCQ SAQ VIVA
	• Classify veins on the basis of function and size	C1		
	• Describe differences between arteries and veins	C2		
	• Define anastomosis and discuss different types of arterial and venous anastomosis	C2		
	• Differentiate between anatomic end arteries and functional end arteries giving example	C2		
	• Discuss related clincals	C3		
	• How to access HEC digital library	C3		
	• How to read relevant research article	C3		
Histology				
Histology of CVS (Arteries and Veins)	• Describe general histological structure of arteries and veins	C2	LGIS	MCQ SAQ VIVA
	• Tabulate histological differences between arterioles, medium sized arteries, and large arteries	C2		
	• Discuss related clinicals	C3		
	• How to access HEC digital library	C3		
	• How to read relevant research article	C3		
Histology of CVS	• Differentiate between continuous, fenestrated and sinusoidal capillaries	C2	LGIS	MCQ
	• Enlist bio functions of endothelium	C2		

(Capillaries)	• Discuss related clinicals	C2		SAQ VIVA
	• How to access How to access HEC digital library	C3		
	• How to Read How to read relevant research article	C3		
Histology of CVS (Tunics of Heart & Lymphatic System)	• Describe histological details of endocardium, myocardium and epicardium	C3	LGIS	MCQ SAQ VIVA
	• Tabulate differences between blood capillaries and lymphatic capillaries	C2		
	• How to access How to access HEC digital library	C3		
	• How to Read How to read relevant research article	C3		
Embryological Development				
Development of CVS (Development of Veins)	• Recall the process of vasculogenesis	C2	LGIS	MCQ SAQ VIVA
	• Describe venous drainage of embryo	C2		
	• Enlist derivatives of vitelline veins	C1		
	• Discuss role cardinal veins	C2		
	• Describe Development of inferior vena cava	C2		
	• Discuss related Congenital abnormalities	C3		
	• How to access HEC digital library	C3		
	• How to read relevant research article	C3		
Development of CVS (Aortic Arches and derivatives)	• Describe development and transformation of aortic arches	C2	LGIS	MCQ SAQ VIVA
	• Enlist derivatives of 1-6th aortic arches	C1		
	• Discuss formation of intersegmental arteries	C2		
	• Describe sources and formation of coronary arteries	C2		
	• Discuss development of aorta Related Congenital abnormalities	C3		
	• How to access HEC digital library	C3		
	• How to read relevant research article	C3		
Development of CVS (Formation, Position and Partitioning of heart tube)	• Discuss establishment of cardiogenin field	C2	LGIS	MCQ SAQ VIVA
	• Describe formation and position of heart tube in developing embryo	C2		
	• Discuss formation of cardiac loop	C2		
	• Describe development of sinus venosus	C2		
	• Explain importance of septum spurium	C2		
	• Describe development of cardiac septa	C2		
	• Discuss different methods of septum formation	C2		
	• Explain septum formation in right atrium	C2		
	• Describe development and differentiation of atria	C2		

	• Discuss related congenital abnormalities	C3		
	• How to access HEC digital library	C3		
	• How to read relevant research article	C3		
Development of CVS (Formation and partitioning of Ventricles)	• Discuss formation of septum in atrioventricular canal	C2	LGIS	MCQ SAQ VIVA
	• Describe formation of atrioventricular valves	C2		
	• Explain septum formation in truncusarteriosis&conuscordis	C2		
	• Describe septum formation in ventricles Discuss formation of semilunar valves	C2		
	• Discuss development of conducting system of heart	C2		
	• Discuss related Congenital abnormalities	C3		
	• How to access HEC digital library	C3		
	• How to read relevant research article	C3		
Development of CVS (Fetal circulation)	• Describe fetal circulation in detail	C2	LGIS	MCQ SAQ VIVA
	• Discuss role of foramen ovale, ductus arteriosis and ductus venosis in fetal circulation and their fate	C2		
	• Differentiate between fetal and postnatal circulation	C2		
	• Discuss related Congenital abnormalities	C3		
	• How to access HEC digital library	C3		

Physiology Large Group Interactive Session (LGIS)

Topics	Learning Objectives	References	Learning Resources	Learning Domains	Learning Strategy	Assessment Tools
Introduction to CVS	1. Describe scheme of circulation through the heart and body	• Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.Cardiovascular Physiology (Chapter 14, Page 469) • Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4, Page 117) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 02, (Chapter 05, Page 101)	1. https://youtu.be/28CYhgjrBLA 2. https://training.seer.cancer.gov/anatomy/cardiovascular/#:~:text=The%20cardiovascular%20system%20is%20sometimes,arteries%2C%20veins%2C%20and%20capillaries.	1.C1	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE

Classification of blood vessels & Biophysical considerations	1.Enumerate Classification of blood vessels. 2.Explain structure and functions of types of blood vessels	• Ganong's Review of Medical Physiology.25TH Edition.Section 05, Cardiovascular Physiology (Chapter 31, Page 567,571) • Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 15, Page 513) • Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4, Page 119) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 04 (Chapter 15, Page 183)	1. https://youtu.be/ar2_UPiGzmU 2. https://training.seer.cancer.gov/anatomy/cardiovascular/blood/classification.html	C1 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Heart Sounds	Describe four heart sound and differences between 1st and 2nd heart sounds	• Ganong's Review of Medical Physiology.25TH Edition.Section 05, Cardiovascular Physiology (Chapter 30, Page 542) • Textbook of Medical Physiology by Guyton & Hall.14th Edition.Section 04. (Chapter 23, Page 283)	**1.** https://youtu.be/dBwr2GZCmQM **2.** https://www.utmb.edu/pedi_ed/CoreV2/Cardiology/cardiologyV2/cardiologyV23.html	C1/C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Regulation of blood flow	Define and describe Resistance to Blood flow Describe regulation of Blood pressure and Poiseuilles law Describe factors related with Blood viscosity and its role in regulation	• Ganong's Review of Medical Physiology.25TH Edition.Section 05, Cardiovascular Physiology (Chapter 31, Page 575) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 02(Chapter 5, Page 107) (Chapter 6,page 110)	1. https://youtu.be/cocB-M3h9k0 2. https://journals.physiology.org/doi/full/10.1152/advan.00074.2010	C1 C1 C1	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE

		• Textbook of Medical Physiology by Guyton & Hall.14th Edition.Section 04. (Chapter 14, Page 173) (Chapter 17, Page 205)				
Capillary circulation, Concept of vasomotion and starling forces	Explain the details of types of starling forces . Expalin role of starling forces in different pathological conditions	• Ganong's Review of Medical Physiology.25TH Edition.Section 05,(Chapter 31, Page 577) • Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 170) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 02(Chapter 6,Page 119) • Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 04. (Chapter 16, Page 193)	1. https://youtu.be/YNROPnYy1tc 2. https://www.osmosis.org/learn/Microcirculation_and_Starling_forces	C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Functions of veins, Venous return and factors affecting venous return	Describe how veins are different from arteries Explain Various factors that affect venous return	• Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 158) • Textbook of Medical Physiology by Guyton & Hall.14th Edition.Section 4. (Chapter 15, Page 188)	1. https://youtu.be/FKJr5uqPv5s 2. https://www.sciencedirect.com/topics/medicine-and-dentistry/venous-return	C1 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Introduction to ECG & its clinical importance	Enumerate and describe normal components of ECG Draw normal ECG Describe the method of recording ECG Describe the following. Bipolar limb leads.	• Ganong's Review of Medical Physiology.25TH Edition.Section 01,Immunity,Infection and Inflammation(Chapter 29, Page 522)	1. https://youtu.be/SEFhbK8ZCgk 2. https://my.clevelandclinic.org/health/diagnostics/16953-electrocardiogram-ekg	C1 C1 C1 C1 C1 C1 C1 C1	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST

	Describe Einthovians law and Enthovian triangle. Describe Chest leads and Augmented unipolar limb leads Describe how to read normal ECG Describe the principles of vectorial analysis of ECG. Describe the vectorial analysis of normal ECG	• Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 14,Page 491) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Chapter 09,Page 170) • Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 03. (Chapter 11, Page 135)		C1		based Assessment) OSPE
Cardiac output & its control, measurement of cardiac output, pathologically high and low cardiac output	Explain cardiac output Understand various method to measure cardiac output Explain various factor which help in regulation of heart rate and stroke volume	• Ganong's Review of Medical Physiology.25TH Edition.Section 05,(Chapter 30, Page 543) • Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 14,Page 500-507) • Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 149,154-158) • Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 04. (Chapter 20, Page 245)((Chapter 22, Page 280)	1. https://youtu.be/WuGMqezV3eo 2. https://teachmephysiology.com/cardiovascular-system/cardiac-output/	C2 C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Vectorial analysis & arrhythmias I	Describe the principles of vectorial analysis of ECG. Describe the vectorial analysis of normal ECG Define arrhythmia Describe abnormal sinus rhythms	• Ganong's Review of Medical Physiology.25TH Edition.Section 05(Chapter 29, Page 526) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.(Chapter 09,Page 179,180-189) • Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 03.	1. https://www.brainkart.com/article/Principles-of-Vectorial-Analysis-of-Electrocardiograms_19241/ 2. https://youtu.be/6LrptveKYus 3. https://www.medicalnewstoday.com/articles/8887#definition	C1 C1 C1 C1	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment)

		(Chapter 12, Page 143)((Chapter 13, Page 157)				OSPE
Cardiac cycle - I, Events of cardiac cycle and its graphical representation	Describe the cardiac cycle in detail Enumerate and explain its events Explain the events of cardiac cycle	• Ganong's Review of Medical Physiology.25TH Edition.Section 05,(Chapter 30, Page 537) • Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 14,Page 495-500) • Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 154) • Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 03. (Chapter 9, Page 117)	1. https://youtu.be/XbivIaFPoQI 2. https://www.sciencedirect.com/science/article/pii/S0010027721003309 3. https://youtu.be/sLLLOaZ85Lk 4. https://teachmephysiology.com/cardiovascular-system/cardiac-cycle-2/cardiac-cycle/ 5. https://youtu.be/HNkwXZSSssU	C1 C1, C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Arrhythmias II	Describe abnormal rhythms resulting from the block of heart signals within the intra cardiac conduction pathways Define ectopic beats Explain the following with the help of relevant ECGs. Premature contractions. Paroxysmal tachycardia. Ventricular fibrillation. Atrial fibrillation. Atrial flutter. Cardiac arrest. Describe different degrees of heart block and ECG changes Explain atrial and ventricular flutter and fibrillation	• Ganong's Review of Medical Physiology.25TH Edition.Section 05(Chapter 29, Page 527) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.(Chapter 09,Page 180-189) • Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 03. (Chapter 13, Page 157)	1. https://youtu.be/6LrptveKYus 2. https://www.medicalnewstoday.com/articles/8887#definition	C1 C1 C2 C2 C2 C2 C2 C1 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE

Cardiac cycle – II, Functions of ventricles as pumps, aortic pressure curve, regulation of heart pumping	Draw various events during cardiac cycle Explain regulation of heart pumping	• Ganong's Review of Medical Physiology.25TH Edition.Section 05,(Chapter 30, Page 537) • Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 14,Page 495-500) • Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 154) • Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 03. (Chapter 9, Page 117-126)	1. https://youtu.be/dmPtaJxgRQU 2. https://youtu.be/VI9zo_CzQ9g 3. https://youtu.be/pli2zs8Kekw 4. https://youtu.be/kMJ-US6Qfqc 5. https://youtu.be/qhtAhbyBSfs 6. https://teachmephysiology.com/cardiovascular-system/cardiac-cycle-2/cardiac-cycle/	C1 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
ECG changes in myocardial hypertrophies, ischemic heart disease	Discuss ECG changes in different diseases	• Ganong's Review of Medical Physiology.25TH Edition.Section 05(Chapter 29, Page 532) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.(Chapter 12,Page 151)	• https://youtu.be/SEFhbK8ZCgk • https://youtu.be/D0V_aQXtRSw • https://www.msdmanuals.com/home/heart-and-blood-vessel-disorders/diagnosis-of-heart-and-blood-vessel-disorders/electrocardiography	1.C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Short term regulation of blood pressure	Explain short term regulation of blood pressure Explain central nervous system ischemic response & cushing reaction	• Ganong's Review of Medical Physiology.25TH Edition.Section 05(Chapter 32, Page 585,590) • Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 15,Page 517,528) • Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 163)	1. https://youtu.be/HUf1LtkPj1k 2. https://www.sciencedirect.com/topics/nursing-and-health-professions/blood-pressure-regulation 3. https://www.cliffsnotes.com/study-guides/anatomy-and-physiology/the-cardiovascular-	C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE

		• Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.(Chapter 18,Page 217)	system/control-of-blood-pressure			
Congestive cardiac failure	Define cardiac failure. Classify cardiac failure Enumerate the causes of cardiac failure and discuss in detail. Discuss and differentiate between compensated heart failure and decompensated heart failure Discuss and differentiate between Low and high output cardiac failure Define Cardiac reserve.	• Ganong's Review of Medical Physiology.25TH Edition.Section 05(Chapter 30, Page 538) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.(Chapter 22,Page 271)	1. https://www.webmd.com/heart-disease/guide-heart-failure 2. https://youtu.be/EDCaFKgtXks 3. https://www.healthline.com/health/congestive-heart-failure	C1/C2 C1 C2 C2 C1	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Long term regulation of blood pressure	Explain the role of kidneys in long term regulation of blood pressure	• Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 163) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 16,page 282) • Textbook of Medical Physiology by Guyton & Hall.14th Edition. (Chapter 19, Page 229)	1. https://youtu.be/5S9xEpAdAgA 2. https://jps.biomedcentral.com/articles/10.1007/s12576-012-0192-0 3. https://onlinelibrary.wiley.com/doi/10.1111/j.1440-1681.2005.04205.x	C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Splanchnic circulation, cutaneous circulation	Describe the Physiologic anatomy of cerebral blood flow Describe the blood flow in normal state and local control of blood flow	• Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 173) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 7,page 146)	1. https://youtu.be/hr6oGuW7mVA 2. https://www.sciencedirect.com/topics/medicine-and-dentistry/splanchnic-blood-flow	C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment)

			3. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2999290/			OSPE
Skeletal muscle blood flow, Cardiovascular changes during exercise	Discuss the blood flow regulation in skeletal muscle at rest and during exercise.	Ganong's Review of Medical Physiology.25TH Edition.Section 05(Chapter 30, Page 549) Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 178) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.(Chapter 07,Page 148) Textbook of Medical Physiology by Guyton & Hall.14th Edition.. (Chapter 18, Page 226)(Chapter 21,Page 259)	1. https://www.sciencedirect.com/topics/medicine-and-dentistry/muscle-blood-flow 2. https://youtu.be/H6Fd8sfE2eQ	C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Fetal circulation & cardiac abnormalities in fetal circulation	Describe the fetal circulation Discuss the pathophysiology of cardiac abnormalities related to it	• Ganong's Review of Medical Physiology.25TH Edition.Section 05(Chapter 33, Page 614) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 4(Chapter 23,Page 288)	1. https://youtu.be/rYVGjbzmAtg 2. https://www.sciencedirect.com/science/article/abs/pii/0033062072900151 3. https://myhealth.ucsd.edu/Conditions/Heart/Congenital/90,P01790	C1 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Circulatory Shock	Define shock. Describe the physiologic causes of shock. Enumerate various types of shock. Describe the stages of shock Describe the following types of shock in detail.	• Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 4(Chapter 24,Page 293)	1. https://youtu.be/VZtBOaAMG9w 2. https://my.clevelandclinic.org/health/diseases/17837-cardiogenic-shock	1.C1 2.C1 3.C1 4.C1 5.C1 6.C1 7.C1 8.C1 9.C1	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST

	Describe Circulatory shock and Hypovolemic shock. Describe Neurogenic shock. Describe Septic shock. Describe Anaphylactic shock					based Assessment) OSPE
Coronary circulation, Atherosclerosis & acute coronary occlusion	Understand the physiologic anatomy of coronary blood supply and normal coronary blood flow Discuss the control of coronary blood flow	Ganong's Review of Medical Physiology.25TH Edition.Section 05(Chapter 33, Page 610) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.(Chapter 15,Page 265) Textbook of Medical Physiology by Guyton & Hall.14th Edition.. (Chapter 21, Page 262)	1. https://www.msdmanuals.com/professional/cardiovascular-disorders/coronary-artery-disease/overview-of-coronary-artery-disease 2. https://youtu.be/WKrVxKJVh00 3. https://www.uptodate.com/contents/mechanisms-of-acute-coronary-syndromes-related-to-atherosclerosis	1.C2 2.C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Cardiac cycle, Events of cardiac cycle and its graphical representation, Functions of ventricles as pumps, aortic pressure curve, regulation of heart pumping (SDL)	Describe the cardiac cycle in detail Enumerate and explain its events Explain the events of cardiac cycle	• Ganong's Review of Medical Physiology.25TH Edition.Section 05,(Chapter 30, Page 537) • Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 14,Page 495-500) • Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 154) • Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 03. (Chapter 9, Page 117)	1. https://youtu.be/XbivIaFPoQI 2. https://www.sciencedirect.com/science/article/pii/S0010027721003309 3. https://youtu.be/sLLLOaZ85Lk 4. https://teachmephysiology.com/cardiovascular-system/cardiac-cycle-2/cardiac-cycle/ 5. https://youtu.be/HNkwXZSSssU	C1 C1/C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE

Biochemistry Large Group Interactive Session (LGIS)

Topic	Learning Objectives At the end of lecture students should be able to	Learning Domain	Teaching Strategy	Assessment Tool
Definition and Biological importance of lipids.	• Define lipids	C1	LGIS	MCQs SAQs Viva
	• Classify lipids	C2		
	• Describe Biomedical significance of lipids	C2		
Fatty acids	• Classify fatty acids	C1	LGIS	MCQs SAQs Viva
	• Describe physical and chemical properties of fatty acids	C2		
Simple lipids	• Elaborate Structure and physical properties of Triglycerides	C2	LGIS	MCQs SAQs Viva
	• Discuss Chemical properties of Triglycerides and their clinical significance	C2		
Compound lipids (Phospholipids, glycolipids, lipoproteins)	• Classify compound lipids	C2	LGIS	MCQs SAQs Viva
	• Discuss structure and functions of compound lipids	C2		
	• Interpret the clinical role of compound lipids	C3		
Derived lipids	• Describe derived lipids	C2	LGIS	MCQs SAQs Viva
Cholesterol	• Describe Structure and physical properties of Cholesterol	C2	LGIS	MCQs SAQs Viva
	• Discuss Chemical properties and functions	C2		
	• Interpret clinical findings of hypercholesterolemia	C3		
Prostaglandins	• Classify Prostaglandins	C2	LGIS	MCQs SAQs Viva
	• Describe functions and clinical significance of Prostaglandins.	C2		
	• Interpret the role of drugs in prostaglandin synthesis	C3		
Carbohydrate Chemistry				
Introduction and classification of carbohydrates	• Classify carbohydrates	C2	LGIS	MCQs SAQs Viva
	• Explain different types of carbohydrates and their clinical significance	C2		
Isomerism, optical activity and mutarotation	• Discuss Different properties of carbohydrates (Isomerism, optical activity and mutarotation)	C2	LGIS	MCQs SAQs Viva
Monosaccharide	• Classify monosaccharide	C2	LGIS	MCQs SAQs Viva
	• Describe chemical properties of monosaccharide	C2		
	• Interpret the clinical role of sorbitol, mannitol and cardiac glycosides	C3		

Disaccharides	• Describe Structure and functions of Individual sugars	C2	LGIS	MCQs SAQs Viva
Homopolyssacharides	• Explain Structure, physical and chemical properties of homopolyssacharide and their biological importance.	C2	LGIS	MCQs SAQs Viva
Heteropolysaccharides	• Explain Structure, physical and chemical properties of heteropolysaccharides and their biological importance. • Apply the role of heteropolysaccharides in clinical cases	C2 C3	LGIS	MCQs SAQs Viva

Anatomy Small Group Discussion (SGDs)

Topic	Learning Objectives At the end of lecture students should be able to	Learning Domain	Teaching Strategy	Assessment Tool
Thoracic Wall / Thoracic Vertebra	• Define thorax	C1	SGD, Skills Lab	MCQ SAQ VIVA OSPE
	• Discuss components and shape of thoracic cavity.	C2		
	• Discuss the applied and the related clinicalanatomy	C2		
	• Classify Ribs	C1		
	• Describe ribs (side determination, features, attachments, relations, types and ossification.	C2		
	• Discuss the applied and the related clinical anatomy	C3		
	• How to access HEC digital library	C3		
	• How to read relevant research article	C3		
Mediastinum	• Discuss the boundaries and division of mediastinum	C2	SGD Skills lab	MCQ SAQ VIVA OSPE
	• Enumerate the contents of anterior mediastinum.	C1		
	• Discuss related clinicals	C3		
	• How to access HEC digital library	C3		
	• How to read relevant research article	C3		
Pericardium	• Describe the gross features of fibrous pericardium with its blood and nerve supply	C2	SGD Skills lab	MCQ SAQ VIVA OSPE
	• Describe the gross features of serous pericardium with its blood and nerve supply	C2		
	• Describe transverse and oblique pericardial sinus	C2		
	• Describe the Clinical Significance of the Transverse Pericardial Sinus	C3		
	• Define Pericarditis and Pericardial Effusion	C1		
	• How to access HEC digital library	C3		
	• How to read relevant research article	C3		
Heart (External features)	• Demonstrate Position and orientation of heart.	P	SGD, Skills lab	MCQ SAQ VIVA OSPE
	• Describe borders and surfaces of the heart.	C2		
	• Demonstrate the external features of the heart	C2		
	• Discuss related clincals	C3		
	• How to access HEC digital library	C3		
	• How to read relevant research article	C3		
	• Differentiate between muscular and smooth part.	C2		

Heart (Internal features)	• Identify the various openings, important features in inter-atrial septum.	C2	SGD, Skills lab	MCQ SAQ VIVA OSPE
	• Identify S.A node	C2		
	• Discuss internal features of left atrium, inter atrial septum, mitral valve and pulmonary veins.	C1		
	• Discuss importance of modulator band.	C2		
	• Identify mitral valve, intervetntricular septum, aortic vestibule, arotic valve.	C3		
	• Discuss related clinicals	C3		
	• How to access HEC digital library	C3		
	• How to read relevant research article	C3		
Heart (Clinical Correlations)	•	C1	SGD, Skills lab	MCQ SAQ VIVA OSPE
	•			
	•			
	• How to access HEC digital library			
	• How to read relevant research article	C3		
Vasculature of heart	• Describe the origin of coronary arteries	C2	SGD, Skills lab	MCQ SAQ VIVA OSPE
	• Identify course branches and distribution of right coronary arteries and left coronary artery,	C2		
	• Discuss the concept of right and left dominance.	C2		
	• Describe the venous drainage of heart.	C2		
	• Discuss the related applied and clinical anatomy	C3		
	• How to access HEC digital library	C3		
	• How to read relevant research article	C3		
Innervation of Heart	• Describe the formation of superficial and deep cardiac plexus.	C2	SGD, Skills lab	MCQ SAQ VIVA OSPE
	• Discuss related clinicals	C3		
	• How to access HEC digital library	C3		
	• How to read relevant research article	C3		
Superior mediastinum (Trachea, Esophagus, Ascending Aorta)	• Enumerate the structure of superior mediastinum	C1	SGD Skills lab	MCQ SAQ VIVA OSPE
	• Describe great vessels in superior mediastinum	C2		
	• How to access HEC digital library	C3		
	• Discuss related clincals	C3		

	• How to read relevant research article	C3		
Posterior mediastinum (Boundaries and Structures)	• Identify structures in posterior mediastinum	C2	SGD, Skills lab	MCQ SAQ VIVA OSPE
	• Describe anatomy of structure in Posterior mediastinum	C1		
	• Identify course, relations and branches of descending aorta.	C2		
	• How to access HEC digital library	C3		
	• How to read relevant research article	C3		
Posterior mediastinum (Azygos system)	• Describe formation, course and clinical importance of azygos system of veins	C3	SGD, Skills lab	MCQ SAQ VIVA OSPE
	• Describe formation and importance of hemiazygos vein	C1		
	• How to access HEC digital library	C3		
	• How to read relevant research article	C3		
Surface anatomy / Radiology	• Demonstrate surface projection and radiological aspects of heart, great vessels, trachea, oesphagus, postion of heart valves	P	SGD, Skills lab	MCQ SAQ VIVA OSPE
	• How to access HEC digital library	C3		
	• How to read relevant research article	C3		

Physiology Small Group Discussion (SGDs)

Topic	Learning Objectives At the end of lecture students should be able to	Learning Domain	Teaching Strategy	Assessment Tool
Discussion regarding previous module	• Difficulties regarding questions, MCQs	C1	SGD	MCQs SEQS, Viva OSPE
	• MCQ paper discussion	C2		
Excitation contraction coupling Cardiac action potential	• Describe the mechanism of production of action potential and its propagation in cardiac muscle	C1	SGD	MCQs SEQS Viva OSPE
Cardiac cycle	• Explain events of cardiac cycle	C1	SGD	MCQs SEQS, Viva OSPE
	• Draw various events during cardiac cycle	C1		
ECG	• Define arrhythmia	C1	SGD	MCQs

	• Describe abnormal rhythm	C1		SEQS Viva OSPE
Venous return	• Describe how veins are different from arteries	C1	SGD	MCQs SEQS Viva OSPE
	• Various factors affecting venous return	C1		
Long term regulation of blood pressure	• Explain the role of kidney in long term regulation	C1	SGD	MCQs SEQS Viva OSPE
CCF HTN	• Describe cardiac failure	C1	SGD	MCQs SEQS Viva OSPE
	• Classify cardiac failure	C2		
	• HTN	C2		

Biochemistry Small Group Discussion (SGDs)

Topic	Learning Objectives At the end of lecture students should be able to	Learning Domain	Teaching Strategy	Assessment Tool
Introduction of lipids and carbohydrates	• Classify lipids and carbohydrates	C1	SGD	MCQs, SAQs Viva
	• Discuss importance of lipids and carbohydrates	C2		
Fatty acids	• Classify fatty acids	C1	SGD	MCQs SAQs Viva
	• Describe physical and chemical properties of fatty acids	C2		
Cholesterol	• Describe Structure and physical properties of Cholesterol	C2	SGD	MCQs SAQs Viva
	• Discuss Chemical properties and functions	C2		
	• Interpret clinical findings of hypercholesterolemia	C3		
Heteropolysaccharides	• Explain Structure, physical and chemical properties of heteropolysaccharides and their biological importance. • Apply the role of heteropolysaccharides in clinical cases	C2 C3	SGD	MCQs SAQs Viva

Anatomy Self Directed Learning (SDL)

Topic	Learning Objectives At the end of lecture students should be able to	Learning Resources
Thoracic Wall / Thoracic Vertebra	• Define thorax • Discuss components and shape of thoracic cavity. • Discuss the applied and the related clinicalanatomy • Classify Ribs • Describe ribs (side determination, features, attachments, relations, types and ossification. • Discuss the applied and the related clinical anatomy • How to access HEC digital library • How to read relevant research article	• ClinicallyOriented Anatomy 6th Edition, Pg no.73,77, 78-79, 84,89,93,95,98,446,454 https://youtu.be/PoA-Uq9w-7s https://youtu.be/Ok8-nwVLysM https://www.sciencedirect.com/science/article/pii/S0161475415000639
Mediastinum	• Discuss the boundaries and division of mediastinum • Enumerate the contents of anterior mediastinum. • How to access HEC digital library • How to read relevant research article	• ClinicallyOriented Anatomy 6th Edition, P no.107,110,118,127,128,132-133,160-168,171 https://youtu.be/oBR9p_UDTuo https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5111324/
Pericardium	• Describe the gross features of fibrous pericardium with its blood and nerve supply • Describe the gross features of serous pericardium with its blood and nerve supply • Describe transverse and oblique pericardial sinus • Describe the Clinical Significance of the Transverse Pericardial Sinus • Define Pericarditis and Pericardial Effusion • How to access HEC digital library • How to read relevant research article	• ClinicallyOriented Anatomy 6th Edition, P no.111,128-129,133-134 https://youtu.be/5RMeCgJn730 https://www.sciencedirect.com/science/article/abs/pii/S1054880721000302
Heart I External features	• Demonstrate Position and orientation of heart. • Describe borders and surfaces of the heart. • Demonstrate the external features of the heart • How to access HEC digital library	• ClinicallyOriented Anatomy 6th Edition, P no.129,135-137,144-149,153-159,171-172

	• How to read relevant research article	https://youtu.be/uhSBFOTwzDQ https://www.ahajournals.org/doi/full/10.1161/JAHA.122.028014
Heart II Internal features	• Differentiate between muscular and smooth part. • Identify the various openings, important features in inter-atrial septum. • Identify S.A node • How to access HEC digital library • How to read relevant research article	• ClinicallyOriented Anatomy 6th Edition, P no.129,135-137,144-149,153-159,171-172 https://youtu.be/uhSBFOTwzDQ https://www.ahajournals.org/doi/full/10.1161/JAHA.122.028014
Heart III Clinical Co-Relation	• Discuss internal features of left atrium, inter atrial septum, mitral valve and pulmonary veins. • Discuss importance of modulator band. • Identify mitral valve, intervetntricular septum, aortic vestibule, arotic valve. • How to access HEC digital library • How to read relevant research article	• ClinicallyOriented Anatomy 6th Edition, P no.129,135-137,144-149,153-159,171-172 https://youtu.be/uhSBFOTwzDQ https://www.ahajournals.org/doi/full/10.1161/JAHA.122.028014
Vasculature of heart	• Describe the origin of coronary arteries • Identify course branches and distribution of right coronary arteries and left coronary artery, • Discuss the concept of right and left dominance. • Describe the venous drainage of heart. • Discuss the related applied and clinical anatomy • How to access HEC digital library • How to read relevant research article	• ClinicallyOriented Anatomy 6th Edition, P no.129,135-137,144-149,153-159,171-172 https://youtu.be/uhSBFOTwzDQ https://www.ahajournals.org/doi/full/10.1161/JAHA.122.028475
Innervation of Heart	• Describe the formation of superficial and deep cardiac plexus. • How to access HEC digital library • How to read relevant research article	• ClinicallyOriented Anatomy 6th Edition, P no.129,135-137,144-149,153-159,171-172 https://youtu.be/uhSBFOTwzDQ https://www.ahajournals.org/doi/full/10.1161/JAHA.122.028932

Superior mediastinum (Trachea, Esophagus, Ascending Aorta)	• Enumerate the structure of superior mediastinum • Describe great vessels in superior mediastinum • How to access HEC digital library • How to read relevant research article	• ClinicallyOriented Anatomy 6th Edition, P no.127-128,132,160-166,179 https://youtu.be/2POIlBe2xR4 https://www.sciencedirect.com/science/article/abs/pii/S1472029906000336
Posterior mediastinum I	• Identify structures in posterior mediastinum • Describe anatomy of structure in Posterior mediastinum • Identify course, relations and branches of descending aorta. • How to access HEC digital library • How to read relevant research article	• ClinicallyOriented Anatomy 6th Edition, P no. 128, 168-172, 179 https://youtu.be/2POIlBe2xR4 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9792830/
Posterior mediastinum II	• Describe formation, course and clinical importance of azygos system of veins • Describe formation and importance of hemiazygos vein • How to access HEC digital library • How to read relevant research article	• ClinicallyOriented Anatomy 6th Edition, P no. 128, 168-172, 179 https://youtu.be/2POIlBe2xR4 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9792830/
Surface anatomy / Radiology	• Demonstrate surface projection and radiological aspects of heart, great vessels, trachea, oesphagus, postion of heart valves • How to access HEC digital library • How to read relevant research article	• ClinicallyOriented Anatomy 6th Edition, P no.129,135-137,144-149,153-159,171-172 https://youtu.be/wqiK-8nZEqk https://pubs.rsna.org/doi/10.1148/ryct.220047

Physiology Self Directed Learning (SDL)

Topics Of SDL	Learning Objective	References	Learning Resources	Learning Domains	Learning Strategy	Assessment Tools
ON CAMPUS: Heart Sounds	1. Describe four heart sound and differences between 1st and 2nd heart sounds	• Ganong's Review of Medical Physiology.25TH Edition.Section 05, Cardiovascular Physiology (Chapter 30, Page 542) ❖ Textbook of Medical Physiology by Guyton & Hall.14th Edition.Section 04. (Chapter 23, Page 283)	**1.** https://youtu.be/dBwr2GZCmQM **2.** https://www.utmb.edu/pedi_ed/CoreV2/Cardiology/cardiologyV2/cardiologyV23.html	C1/C2	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE SDL Evaluation
Capillary circulation, Concept of vasomotion and starling forces	1. Explain the details of types of starling forces. 2. Expalin role of starling forces in different pathological conditions	• Ganong's Review of Medical Physiology.25TH Edition.Section 05,(Chapter 31, Page 577) • Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 170) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 02(Chapter 6,Page 119) • Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 04. (Chapter 16, Page 193)	1. https://youtu.be/YNROPnYy1tc 2. https://www.osmosis.org/learn/Microcirculation_and_Starling_forces	1.C2 2.C2	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE SDL Evaluation
Introduction to ECG & its clinical importance	• Enumerate and describe normal components of ECG • Draw normal ECG • Describe the method of recording ECG	• Ganong's Review of Medical Physiology.25TH Edition.Section 01,Immunity,Infection and Inflamma tion(Chapter 29, Page 522)	1. https://youtu.be/SEFhbK8ZCgk **2.** https://my.clevelandclinic.org/health/diagnostics/16953-electrocardiogram-ekg	C1 C1 C1 C1 C1 C1	SDL	MCQ SEQ VIVA VOCE

	• Describe the following. Bipolar limb leads. • Describe Einthovians law and Enthovian triangle. • Describe Chest leads and Augmented unipolar limb leads • Describe how to read normal ECG • Describe the principles of vectorial analysis of ECG. • Describe the vectorial analysis of normal ECG	• Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 14,Page 491) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Chapter 09,Page 170) • Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 03. (Chapter 11, Page 135)		C1 C1 C1 C1 C1 C1 C1 C1 C1 C1 C1		MCQ (LMS based Aseessment, MST based Assessment) OSPE SDL Evaluation
Cardiac cycle - I, Events of cardiac cycle and its graphical representation	• Describe the cardiac cycle in detail • Enumerate and explain its events Explain the events of cardiac cycle	• Ganong's Review of Medical Physiology.25TH Edition.Section 05,(Chapter 30, Page 537) • Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 14,Page 495-500) • Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 154) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 03. (Chapter 9, Page 117)	1.https://youtu.be/XbivIaFPoQI 1. https://www.sciencedirect.com/science/article/pii/S0010027721003309 2. https://youtu.be/sLLLOaZ85Lk 3. https://teachmephysiology.com/cardiovascular-system/cardiac-cycle-2/cardiac-cycle/ 4. https://youtu.be/HNkwXZSSssU	1. C1 2. C1/C2 3. C2	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE SDL Evaluation
Arrhythmias	• Describe the principles of vectorial analysis of ECG. • Describe the vectorial analysis of normal ECG • Define arrhythmia • Describe abnormal sinus rhythms	• Ganong's Review of Medical Physiology.25TH Edition.Section 05(Chapter 29, Page 526) • Physiological Basis of Medical Practice by Best & Taylor's.13th	1.https://www.brainkart.com/article/Principles-of-Vectorial-Analysis-of-Electrocardiograms_19241/ 2.https://youtu.be/6LrptveKYus	1. C1 2. C1 3. C1 4. C1	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE

		Edition.(Chapter 09,Page 179,180-189) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 03. (Chapter 12, Page 143)((Chapter 13, Page 157)	4. https://www.medicalnewstoday.com/articles/8887#definition			SDL Evaluation
Congestive cardiac failure	Explain the characteristics and functions of monocytes. • Explain monocyte-macrophge system; importance	• Ganong's Review of Medical Physiology.25TH Edition.Section 01,Immunity,Infection and Inflamma tion(Chapter 03, Page 67) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 03, Blood(Chapter 21,Page 371)(Chapter 22,Page 387) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 34, Page 450-452)	**1.** https://www.sciencedirect.com/topics/pharmacology-toxicology-and-pharmaceutical-science/mononuclear-phagocyte-system 2.https://bmcbiol.biomedcentral.com/articles/10.1186/s12915-017-0392-4	1.C2 2.C2	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE SDL Evaluation
Long term regulation of blood pressure	1. Explain the role of kidneys in long term regulation of blood pressure	• Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 163) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 16,page 282) Textbook of Medical Physiology by Guyton & Hall.14th Edition. (Chapter 19, Page 229)	1. https://youtu.be/5S9xEpAdAgA 2. https://jps.biomedcentral.com/articles/10.1007/s12576-012-0192-0 3. https://onlinelibrary.wiley.com/doi/10.1111/j.1440-1681.2005.04205.x	C2	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE SDL Evaluation
Skeletal muscle blood flow,	1. Discuss the blood flow regulation in skeletal	Ganong's Review of Medical Physiology.25TH Edition.Section 05(Chapter 30, Page 549)	1. https://www.sciencedirect.com/topics/medicine-and-	C2	SDL	MCQ SEQ

Cardiovascular changes during exercise	muscle at rest and during exercise.	Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 178) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.(Chapter 07,Page 148) Textbook of Medical Physiology by Guyton & Hall.14th Edition.. (Chapter 18, Page 226)(Chapter 21,Page 259)	dentistry/muscle-blood-flow 2. https://youtu.be/H6Fd8sfE2eQ			VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE SDL Evaluation
(OFF CAMPUS): Introduction to CVS	• 1. Describe scheme of circulation through the heart and body	• Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.Cardiovascular Physiology(Chapter 14,Page 469) • Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 117) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 02,(Chapter 05,Page 101)	**1.** https://youtu.be/28CYhgjrBLA 2. https://training.seer.cancer.gov/anatomy/cardiovascular/#:~:text=The%20cardiovascular%20system%20is%20sometimes,arteries%2C%20veins%2C%20and%20capillaries.	1.C1	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE SDL Evaluation
Classification of blood vessels & Biophysical considerations	1.Enumerate Classification of blood vessels. 2.Explain structure and functions of types of blood vessels •	• Ganong's Review of Medical Physiology.25TH Edition.Section 05,Cardiovascular Physiology (Chapter 31, Page 567,571) • Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 15,Page 513) • Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 119)	**1.** https://youtu.be/ar2_UPiGzmU **2.** https://training.seer.cancer.gov/anatomy/cardiovascular/blood/classification.html	1.C1 2. C2	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE SDL Evaluation

		• Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 04 (Chapter 15,Page 183)				
Regulation of blood flow	1.Define and describe Resistance to Blood flow 3. Describe regulation of Blood pressure and Poiseuilles law • Describe factors related with Blood viscosity and its role in regulation	• Ganong's Review of Medical Physiology.25TH Edition.Section 05,Cardiovascular Physiology (Chapter 31, Page 575) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 02(Chapter 5,Page 107)(Chapter 6,page 110) • Textbook of Medical Physiology by Guyton & Hall.14th Edition..Section 04. (Chapter 14, Page 173) (Chapter 17, Page 205)	1. https://youtu.be/cocB-M3h9k0 2. https://journals.physiology.org/doi/full/10.1152/advan.00074.2010	1.C1 2.C1 3.C1	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE SDL Evaluation
Introduction to ECG & its clinical importance	• Enumerate and describe normal components of ECG • Draw normal ECG • Describe the method of recording ECG • Describe the following. Bipolar limb leads. • Describe Einthovians law and Enthovian triangle. • Describe Chest leads and Augmented unipolar limb leads • Describe how to read normal ECG • Describe the principles of vectorial analysis of ECG.	• Ganong's Review of Medical Physiology.25TH Edition.Section 01,Immunity,Infection and Inflamma tion(Chapter 29, Page 522) • Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 14,Page 491) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Chapter 09,Page 170) • Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 03. (Chapter 11, Page 135)	1. https://youtu.be/SEFhbK8ZCgk 2. https://my.clevelandclinic.org/health/diagnostics/16953-electrocardiogram-ekg	C1 C1 C1 C1 C1 C1 C1 C1 C1	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE SDL Evaluation

	• Describe the vectorial analysis of normal ECG					
Vectorial analysis & arrhythmias	• Describe the principles of vectorial analysis of ECG. • Describe the vectorial analysis of normal ECG • Define arrhythmia • Describe abnormal sinus rhythms	• Ganong's Review of Medical Physiology.25TH Edition.Section 05(Chapter 29, Page 526) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.(Chapter 09,Page 179,180-189) • Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 03. (Chapter 12, Page 143)((Chapter 13, Page 157)	1. https://www.brainkart.com/article/Principles-of-Vectorial-Analysis-of-Electrocardiograms_19241/ 3. https://youtu.be/6LrptveKYus 2. https://www.medicalnewstoday.com/articles/8887#definition	C1 C1 C1 C1	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE SDL Evaluation
Ca c cycle	• Describe the cardiac cycle in detail • Enumerate and explain its events • Explain the events of cardiac cycle	• Ganong's Review of Medical Physiology.25TH Edition.Section 05,(Chapter 30, Page 537) • Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 14,Page 495-500) • Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 154) • Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 03. (Chapter 9, Page 117)	1. https://youtu.be/XbivIaFPoQI 2. https://www.sciencedirect.com/science/article/pii/S0010027721003309 3. https://youtu.be/sLLLOaZ85Lk 4. https://teachmephysiology.com/cardiovascular-system/cardiac-cycle-2/cardiac-cycle/ 5. https://youtu.be/HNkwXZSSssU	C1 C1/C2 C2	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE SDL Evaluation
Splanchnic circulation, cutaneous circulation	• Describe the Physiologic anatomy of cerebral blood flow • Describe the blood flow in normal state and local control of blood flow	• Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 173)	1. https://youtu.be/hr6oGuW7mVA 2. https://www.sciencedirect.com/topics/medicine-and-	1.C2 2. C2	SDL	MCQ SEQ VIVA VOCE

		• Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 7,page 146)	dentistry/splanchnic-blood-flow 3. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2999290/			MCQ (LMS based Aseessment, MST based Assessment) OSPE SDL Evaluation
Regulation of blood pressure	1. Explain short term regulation of blood pressure • Explain central nervous system ischemic response & cushing reaction	• Ganong's Review of Medical Physiology.25TH Edition.Section 05(Chapter 32, Page 585,590) • Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 15,Page 517,528) • Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 163) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.(Chapter 18,Page 217)	1. https://youtu.be/HUf1LtkPj1k 2. https://www.sciencedirect.com/topics/nursing-and-health-professions/blood-pressure-regulation 3. https://www.cliffsnotes.com/study-guides/anatomy-and-physiology/the-cardiovascular-system/control-of-blood-pressure	1.C2 2. C2	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE SDL Evaluation

Biochemistry Self Directed Learning (SDL)

Topic	Learning Objectives At the end of lecture students should be able to	References
Protein chemistry		
Classifications and functions of carbohydrates	• Classify carbohydrates • Explain different types of carbohydrates and their clinical significance	• Textbook of Lippincott 8th Edition Chapter No.7 pg 92,93 • Text Book of Harper 32 S T Edition chap No. 15 pg 141, 142 ,144 ,147
Classifications and functions of lipids	• Define lipids • Classify lipids • Describe Biomedical significance of lipids	• Textbook of Harper 32 S T Edtion Chapter No.21 pg 196
Fatty acids and simple lipids	• Classify fatty acids • Describe physical and chemical properties of fatty acids • Elaborate Structure and physical properties of Triglycerides • Discuss Chemical properties of Triglycerides and their clinical significance	• Textbook of Lippincott 8th Eidtion Chapter No.15 pg 196 -199
Classification and Chemical reactions of monosaccharide	• Classify monosaccharide • Describe chemical properties of monosaccharide • Interpret the clinical role of sorbitol, mannitol and cardiac glycosides	• Text Book of Harper 32 S T Edition chap No.15 pg 142, 145
Disaccharides	• Describe Structure and functions of Individual sugars	• Text book of Harper 32 S T Edition Chap No.15 pg 145, 156
Compound lipids	• Classify compound lipids • Discuss structure and functions of compound lipids • Interpret the clinical role of compound lipids	• Textbook of Lippincott 8th Eidtion Chapter No. 21 pg 199-202
Prostaglandins	• Classify Prostaglandins • Describe functions and clinical significance of Prostaglandins. • Interpret the role of drugs in prostaglandin synthesis	• Textbook of Lippincott 8th Eidtion Chapter No. 17 pg 236 • Text Book of Lehninger 7th Edition chap No. 10.3 pg 375,376
Heteropolysaccharides	• Explain Structure, physical and chemical properties of heteropolysaccharides and their biological importance. • Apply the role of heteropolysaccharides in clinical cases	• Textbook of Lippincott 8th Eidtion Chapter No. 14 pg 173-175 • Text Book of Harper 32 S T Edition Chap No.15 pg 147 ,148

Histology Practicals Skill Laboratory (SKL)

Topic	Learning Objectives At The End Of Practical Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Elastic Arteries	• identify characteristic histological features of tunica intima, tunica media and tunica adventitia of elastic arteries under microscope	P1	Skill lab	OSPE
	• Illustrate histological structure of elastic artery	C1		
	• Write two points of identification	C1		
	• How to access HEC digital library	C3		
	• How to read relevant research article	C3		
Muscular Arteries Small Arteries	• identify characteristic histological features of tunica intima, tunica media and tunica adventitia of muscular and small sized arteries arteries under microscope	P1	Skill lab	OSPE
	• Illustrate histological structure of Muscular and small sized artery	C1		
	• Write two points of identification	C1		
	• Differentiate between three types of arteries on histology slides	C1		
	• How to access HEC digital library	C3		
	• How to read relevant research article	C3		
Large Vein	• Identify characteristic histological features of tunica intima, tunica media and tunica adventitia of large vein under microscope	P1	Skill lab	OSPE
	• Illustrate histological structure of large vein	C1		
	• Write two points of identification	C1		
	• How to access HEC digital library	C3		
	• How to read relevant research article	C3		
Medium and small sized vein	• Identify characteristic histological features of tunica intima, tunica media and tunica adventitia of medium and small sized vein under microscope	P1	Skill lab	OSPE
	• Illustrate histological structure of medium and small sized vein	C1		
	• Write two points of identification Differentiate between three types of veins on histology slides	C1		
	• How to access HEC digital library	C3		
	• How to read relevant research article	C3		
Capillaries	• Classify capillaries on the basis of histological structure and function	C1	Skill lab	OSPE
	• Enlist sites of continuous, fenestrated and sinusoidal capillaries	C1		

	• Elaborate characteristic histological features of tunica intima, tunica media and tunica adventitia of capillaries	C1		
	• Draw and label histological structure of each type of capillaries	C1		
	• Write two points of identification	C1		
	• How to access HEC digital library	C3		
	• How to read relevant research article	C3		

Physiology Practicals Skill Laboratory (SKL)

Topic	Learning Objectives At The End Of Practical Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Blood Pressure at rest and during exercise	• Define B. P	P	Skill Lab	OSPE Viva
	• Detail study of apparatus	P		
	• How to use apparatus	P		
	• Indentify changes in blood pressure during exercise	P		
Examination of arterial pulse and JVP	• Importance of radial pulse & JVP	P	Skill Lab	OSPE Viva
	• Procedure	P		
	• Various characteristic of pulse	P		
Examination of arterial pulse and JVP	• Importance of radial pulse & JVP	P	Skill Lab	OSPE Viva
	• Procedure	P		
	• Various characteristic of pulse	P		
ECG	• Detail study of ECG leads	P	Skill Lab	OSPE Viva
	• How to apply leads	P		
	• Recording	P		
	• Discussion about normal ECG	P		
	• Clinical importance	P		
Clinical examination of chest (Heart sounds)	• Inspection	P	Skill Lab	OSPE Viva
	• Palpation	P		
	• Auscultation of all areas of heart	P		
	• Locate apex beat	P		

Biochemistry Practicals Skill Laboratory (SKL)

Topic	Learning Objectives At The End Of Practical Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Lipids	• Describe Physical and chemical properties of lipids (solubility, saponification, Emulsification and Acrolein test)	P	Skill lab	OSPE
Carbohydrates	• Perform Tests for the detection of carbohydrates and reducing sugars (Molisch's and Benedict's tests)	P	Skill lab	OSPE
Carbohydrates	Perform Tests for differentiation between Mono and disaccharides; Aldo and keto sugars (Barford's and Salvinoff's test)	P	Skill lab	OSPE
Carbohydrates	• Perform Iodine test	P	Skill lab	OSPE

SECTION - III

Basic and Clinical Sciences (Vertical Integration)

Content

- **CBLs**
- **Vertical Integration LGIS**
- **Longitudinal Themes**
    - **Biomedical Ethics & Professionlism**
    - **Family Medicine**
    - **Artificial Intelligence (Innovation)**
    - **Integrated Undergraduate Research Curriculum (IUGRC)**

Basic and Clinical Sciences (Vertical Integration)

Case Based Learning (CBL)

Subject	Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain
Anatomy	• Cardiac Temponade	Apply basic knowledge of subject to study clinical case.	C3
	• Coarctation of Aorta	Apply basic knowledge of subject to study clinical case.	C3
Physiology	• Pitting edema	Apply basic knowledge of subject to study clinical case.	C3
	• Palpitations / Tachycardia	Apply basic knowledge of subject to study clinical case.	C3
Biochemistry	• Atherosclerosis	Apply basic knowledge of subject to study clinical case.	C3
	• Heparin/dextran	Apply basic knowledge of subject to study clinical case.	C3

Large Group Interactive Sessions (LGIS)

Pathology

Topic	Learning Objectives At the end of lecture students should be able to	Learning Domain	Teaching Strategy	Assessment Tool
Edema	• Define edema	C1	LGIS	MCQ
	• Classify edema	C2		
	• Discuss pathophysiology of edema with clinical correlation	C2		
Thrombosis	• Define embolus	C1	LGIS	MCQ
	• Describe different types of emboli with clinical context ○ Thrombotic ○ Fat and marrow ○ Cholesterol ○ Air ○ Fat	C1		
	• Differentiate between pulmonary and systemic thrombo-embolism with clinical relevance	C2		
	• Describe the Patho-genetic mechanism of infarction	C1		

Infarction	• Describe commonly occurring infarcts in different clinical settings	C1	LGIS	MCQ
Shock	• Define shock	C1	LGIS	MCQ
	• Enumerate Types with clinical examples	C1		
	• Describe pathogenesis of shock	C1		
	• Describe stages of shock with clinical examples	C1		

Medicine

Topic	At the End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Ecg changes	• Discuss normal ECG and its various components.	C2	LGIS	MCQs
	• Explain important ECGs seen in emergency department.	C2		
Hypertension	• Define Hypertension	C1	LGIS	MCQs
	• Discuss various causes and grades.	C2		
	• Explain the clinical presentation.	C2		
	• Compare between primary and secondary hypertension.	C2		
	• Enlist the lab investigations to be done for hypertension.	C2		
	• Discuss the treatment plan of hypertension.	C2		
Overview of acute coronary syndrome	• Discuss ACS and its various causes.	C2	LGIS	MCQs
	• Illustrate the clinical presentation of ACS.	C2		
	• Explain the workshop to be done in E.R for ACS	C2		
	• Discuss the treatment of ACS	C2		
Management of heart failure	• Discuss the stepwise management of heart failure.	C2	LGIS	MCQs
Management of shock	• Discuss the management according to various types of shock.	C2	LGIS	MCQs

Surgery

Topic	At the End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Congenital cardiac anomalies	• Describe: • Various cardiac deformities • & congenital malformations	C1	LGIS, CBL	MCQs
	• Significance of deformities • General and operative management outline	C1		
Introduction to Cardiac Surgery	• To outline basics of Cardiac surgery	C1	LGIS	MCQs
	• Differentiate from other subspecialties	C2		
	• Basic cardiac patient management	C2		
Ectopia Cordis & Dextrocardia	• Describe: • Various cardiac abnormalities with significance	C2	LGIS	MCQs
	• General and operative management outline	C2		
Congenital cardiac anomalies	• Describe: • Various cardiac deformities • & congenital malformations	C2	LGIS	MCQs
	• Significance of deformities • General and operative management outline	C2		
Introduction to Cardiac Surgery	• To outline basics of Cardiac surgery	C1	LGIS	MCQs
	• Differentiate from other subspecialties	C2		
	• Basic cardiac patient management	C2		

Obstetrics & Gynaecology

Topic	At The End Of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Cardiovascular changes in pregnancy, common cardiac diseases	• Understand physiological changes in cardiovascular system during pregnancy (incl. plasma volume, stroke volume, cardiac output, blood pressure)	C2	LGIS	MCQs
	• Know physiological versus pathological symptoms related to CVS	C2		
	• Briefly describe clinical presentations of common cardiac diseases during pregnancy (rheumatic heart disease, cardiomyopathy, cardiac failure)	C2		
	• The effect of cardiac disease on fetus and the mother	C2		
Hypertensive disorders in pregnancy (gestational hypertension, pre-eclampsia)	• Define gestational hypertension	C1	LGIS	MCQs
	• Describe the spectrum of hypertensive disordersduring pregnancy with proper definitions	C2		
	• Comprehend pathophysiology of these disorders	C2		
	• Know clinical presentation of hypertensive disorders	C2		
	• Justify relevant laboratory investigations	C2		
	• Understand principles of management	C2		
	• Enlist maternal and fetal complications	C2		
Obstetric shock	• Define circulatory shock	C1	LGIS	MCQs
	• Differentiate between different types of shock in pregnancy according to their pathophysiology	C2		
	• Appreciate clinical features of shock	C2		
	• Enumerate common causes of hypovolemic shock in pregnancy	C2		
	• Outline management of hypovolemic shock	C2		

Peadiatrics

Topic	At the End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Murmurs	• Differentiate between cyanotic and acyanotic congenital heart diseases on the basis of clinical features	C2	LGIS	MCQs

Eye

Topic	At the End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Retinal changes in hypertension	• Define hypertensive retinopathy	C1	LGIS CBL	MCQs
	• Describe stages of hypertensive retinopathy	C2		
	• Explain pathophysiology of hypertensive retinopathy	C2		

Behavioral Sciences & Biomedial Ethics

Topic	At the End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Breaking bad news	• To be able to break bad news to the patient or their families in clinical settings and dealing with emotions arising	C2	LGIS CBL	MCQS
Stress and its management	• To be able to define types of stress, its causes and management of stress	C2	LGIS CBL	MCQS

Radiology

Topic	At the End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Radiology of hip bone & Lower Limb	• Interpret normal x-rays of Hip bone & Lower Limb	C2	LGIS	MCQs
	• Discuss features of different Fractures of Hip Bone & Lower Limb	C2		

Integrated Undergraduate Research Curriculum (IUGRC)

Session	Learning Objectives
Students Practical Session 5: (placement in 5th Module) (work track & assessment by Logbook)	In supervised session, at the end of the session, participants would be able to; **(Los)** 1. Write the scientific references under some format. 2. Explain the Underlying areas of human health pertaining to topic of their individual group poster (clinical or basic science) at their level. 3. Relate their clinical or basic poster relevant learning with their formal learning during 1st year MBBS. 4. Write the scientific references under some format. 5. Explain the Underlying areas of human health pertaining to topic of their individual group poster (clinical or basic science) at their level. 6. Relate their clinical or basic poster relevant learning with their formal learning during 1st year MBBS.

Family Medicine

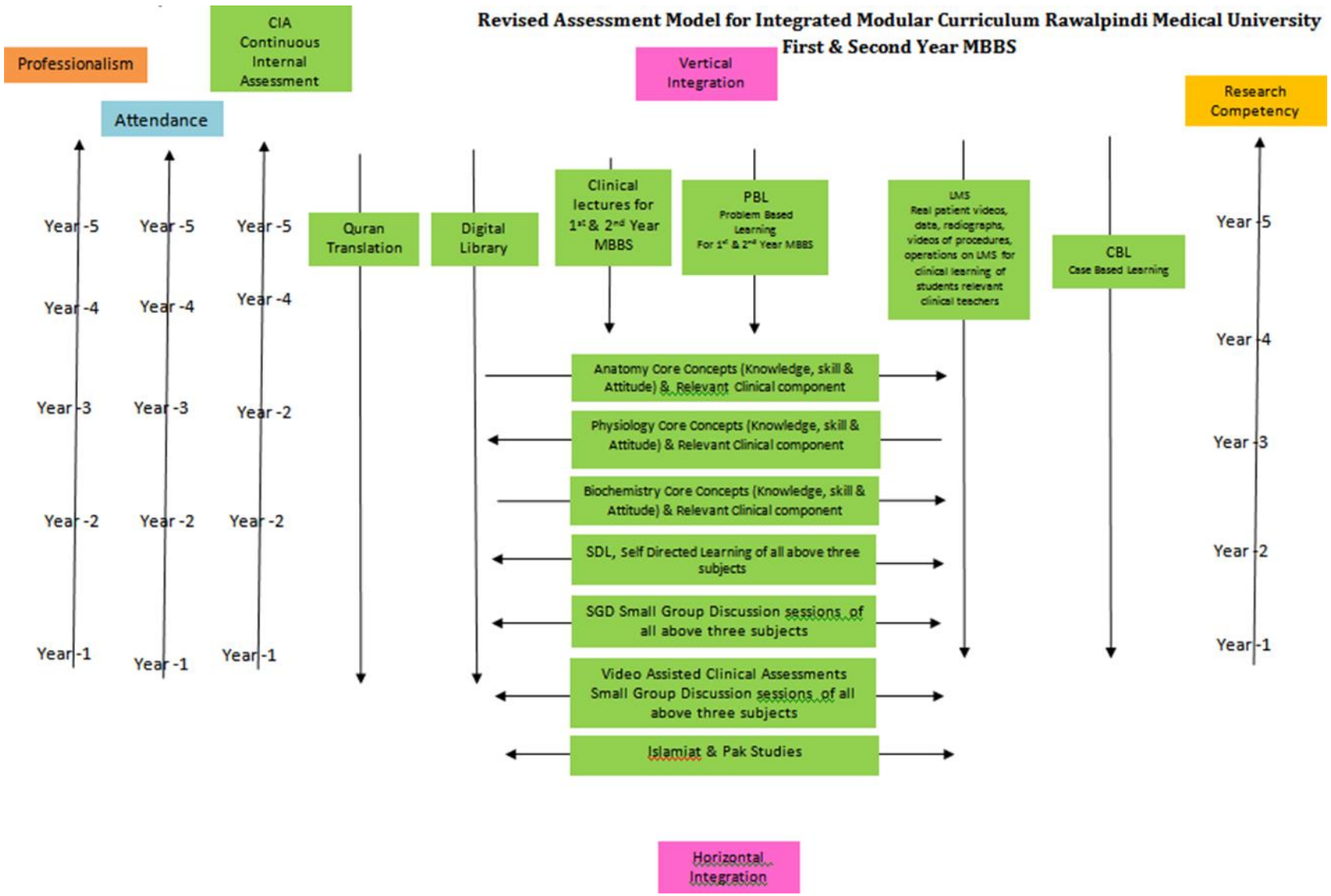
Topic	At the End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Approach to a patient with chest pain	• Describe chest pain	C1	LGIS	MCQs
	• Discuss various causes	C2		
	• Explain the clinical presentation.	C2		
	• Enlist the lab investigations	C2		
	• Decision for referral of patient	C2		

SECTION - IV

Assessment Policies

Contents

- **Assessment plan**
- **Types of Assessment:**
- **Modular Examinations**
- **Block Examination**
- **Table 4: Assessment Frequency & Time in CVS Module**



Gauge for Continuous Internal Assessment (CIA)

Red Zone	High Alert	Yellow Zone	Green Zone	Excellent	Extra Ordinary
0 - 25%	26 - *50%	51 - 60%	61 – 70%	71 – 80%	81 - 100%

*50% and above is Passing Marks.

Gauge for attendance percentage

Red Zone	High Alert	Yellow Zone-1	Yellow Zone-2	Green Zone	Excellent
0 - 25%	26 - 50%	51 - 60%	61 – 74%	*75 – 80%	81 - 100%

90% is eligibility criteria for appearing in professional examination.

Assessment plan

University has followed the guidelines of Pakistan Medical and Dental Council for assessment. Assessment is conducted at the mid modular,modular and block levels.

Types of Assessment:

The assessment is formative and summative.

Formative Assessment	Summative Assessment
Formative assessment is taken at modular (2/3rd of the module is complete) level through MS Teams. Tool for this assessment is best choice questions and all subjects are given theshare according to their hour percentage.	Summative assessment is taken at the mid modular (LMS Based),modular and block levels.

Modular Assessement

Theory Paper	Viva Voce
There is a module examination at the end of first module of each block. The content of the whole teaching of the module are tested in this examination. It consists of paper with objective type questions and structured essay questions. The distribution of the questions is based on the Table of Specifications of the module. (Annexure I attached)	Structured table viva voce is conducted including the practical content of the module.

Block Assessement

On completion of a block which consists of two modules, there is a block examination which consists of one theory paper and a structured viva with OSPE.

Theory Paper	Block OSPE
There is one written paper for each subject. The paper consists of objective type questions and structured essay questions. The distribution of the questions is based on the Table of Specifications of the module.	This covers the practical content of the whole block.

Table 4-Assessment Frequency & Time in CVS Module

Block	Sr #	Module – 1 CVS Module Components	Type of Assessments	Total Assessments Time			No. of Assessments	
				Assessment Time	Summative Assessment Time	Formative Assessment Time		
Block-I	1	Mid Module Examinations LMS based (Anatomy, Physiology & Biochemistry)	Summative	30 Minutes	3 Hour 15 Minutes	45 Minutes	2 Formative	6 Summative
	2	Topics of SDL Examination on MS Team	Formative	30 Minutes				
	3	End Module Examinations (SEQ & MCQs Based)	Summative	2 Hours				
	4	Anatomy Structured and Clinically Oriented Viva	Summative	10 Minutes				
	5	Physiology Structured & Clinically oriented Viva voce	Summative	10 Minutes				
	6	Assessment of Clinical Lectures	Formative	15 Minutes				
	7	Assessment of Bioethics Lectures	Summative	2 Minutes				
	8	Assessment of IUGRC Lectures	Summative	10 Minutes				

Learning Resources

Subject	Resources
Anatomy	**A. Gross Anatomy** 1. Gray's Anatomy by Prof. Susan Standring 42th edition, Elsevier. 2. Clinical Anatomy for Medical Students by Richard S. Snell 10th edition. 3. Clinically Oriented Anatomy by Keith Moore 9th edition. 4. Cunningham's Manual of Practical Anatomy by G.J. Romanes, 16th edition, Vol-I, II and III **B. Histology** 1. B. Young J. W. Health Wheather's Functional Histology 6th edition. 2. Medical Histology by Prof. Laiq Hussain 7th edition. **C. Embryology** 1. Keith L. Moore. The Developing Human 11th edition. 2. Langman's Medical Embryology 14th edition.
Physiology	**A. Textbooks** 1. Textbook Of Medical Physiology by Guyton And Hall 14th edition. 2. Ganong ' S Review of Medical Physiology 26th edition. **B. Reference Books** 1. Human Physiology by Lauralee Sherwood 10th edition. 2. Berne & Levy Physiology 7th edition. 3. Best & Taylor Physiological Basis of Medical Practice 13th edition. 4. Guyton & Hall Physiological Review 3rd edition.
Biochemistry	**Textbooks** 1. Harper's Illustrated Biochemistry 32th edition. 2. Lehninger Principle of Biochemistry 8th edition. 3. Lippincott Biochemistry 8th edition.
Community Medicine	**Textbooks** 1. Community Medicine by Parikh 25th edition. 2. Community Medicine by M Illyas 8th edition. 3. Basic Statistics for the Health Sciences by Jan W Kuzma 5th edition.
Pathology/Microbiology	**Textbooks** 1. Robbins & Cotran, Pathologic Basis of Disease, 10th edition. 2. Rapid Review Pathology, 5th edition by Edward F. Goljan MD. 3. http://library.med.utah.edu/WebPath/webpath.html
Pharmacology	**Textbooks** 1. Lippincot Illustrated Pharmacology 9th edition. 2. Basic and Clinical Pharmacology by Katzung 5th edition.

SECTION - V

Time Table

Integrated Clinically Oriented Modular Curriculum for first Year MBBS

CVS Module Time Table

First Year MBBS

Session 2022-2023

Batch- 50

CVS Module Team

Module Name	:	CVS Module
Duration of module	:	05 Weeks
Coordinator	:	Dr. Aneela Yasmeen
Co-Coordinator	:	Dr. Sheena Tariq
Reviewed by	:	Module Committee

Module Committee		
1.	Vice Chancellor RMU	Prof. Dr. Muhammad Umar
2.	Director DME	Prof. Dr. Rai Muhammad Asghar
3.	Convener Curriculum	Prof. Dr. Naeem Akhter
4.	Dean basic sciences and Chairperson Anatomy	Prof Dr. Ayesha Yousaf
5.	Additional Director DME	Prof. Dr. Ifra Saeed
6.	Chairperson Physiology	Prof. Dr. Samia Sarwar
7.	Chairperson Biochemistry	Dr. Aneela Jamil
8.	Focal Person Anatomy	Prof Dr. Ayesha Yousaf
9.	Focal Person Physiology	Dr. Sidra Hamid
10.	Focal Person Biochemistry	Dr. Aneela Jamil
11.	Focal Person Pharmacology	Dr. Zunera Hakim
12.	Focal Person Medicine	Dr Madiha Nazar
13.	Focal Person Pathology	Dr. Asiya Niazi
14.	Focal Person Behavioral Sciences	Dr. Saadia Yasir
15.	Focal Person Community Medicine	Dr. Afifa Kulsoom
16.	Focal Person Quran Translation Lectures	Dr. Fahad Anwar

Module Task Force Team		
1.	Coordinator	Dr. Aneela Yasmeen Senior demonstrator physiology
2.	Co-coordinator	Dr. Kashif Senior Demonstrator of Biochemistry
3.	DME Focal person	Dr. Sidra Hamid Assistant Professor Physiology
4.	Co-coordinator	Dr. Ali Raza Demonstrator of Anatomy
5.	Co-coordinator	Dr. Sheena Tariq APWMO of Physiology

DME Implementation Team		
1.	Director DME	Dr. Rai Muhammad Asghar
2.	Deputy Director DME	Dr. Shazia Zeb
3.	Implementation Incharge 1st&2nd Year MBBS	Prof. Dr. Ifra Saeed
4.	Module planner & implementation coordinator	Dr. Sidra Hamid
5.	Editor	Muhammad Arslan Aslam

Discipline Wise Details of Modular Content

Block	Module	General Anatomy	Embryology	Histology	Gross Anatomy
II1	• Anatomy	• Heart & Vessels	• Cardiovascular System	• Heart & Vessels	Mediastinum, Heart, Great Vessels
	• Biochemistry	• Carbohydrate chemistry, Lipid chemistry			
	• Physiology	• The Heart as a Pump and Function of the Heart Valves& regulation of heart pumping, cardiac cycle • Rhythmical Excitation of the Hear &Specialized excitatory&conductive system of the heart & its control (revisit) • Electrocardiogram, its interpretation & its abnormalities • Medical Physics of Pressure, Flow, and Resistance, Vascular Distensibility and Functions of the Arterial and Venous Systems • Microcirculation and the Lymphatic System, Local and Humoral Control of Blood Flow by the Tissues • Nervous Regulation of the Circulation, and Rapid & Long-Term Control of Arterial Pressure, hypertension • Cardiac Output, Venous Return, and Their Regulation • Muscle Blood Flow and Cardiac Output During Exercise; the Coronary & regional circulation • Cardiac Failure, Circulatory Shock • Heart Valves and Heart Sounds; Dynamics of Valvular and Congenital Heart Defects			
	• Behavioural Sciences, Bioethics & Professionlism	• Breaking the bad news • Stigma to mental illness			
	• Radiology, Artificial Inteligence & Innovation	• Chest radiograph with perspective of cardiovascular system • Radiology with perspective of Artificial Intelligence & Innovation.			
	• Family Medicine	• Approach to a patient with chest pain			
	• Research	• Researh Club Activity (Synopsis writing)			
	• Vertical components	• The Holy Quran Translation Component			
	• Vertical Integration	Clinically content relevant to CVS module • Risk factors of coronary vascular disease (Community Medicine) • Breaking bad news (Behavior Sciences) • DME orientation/paper discussion (DME) • Thrombosis & Infarction (Pathology) • Approach to a patient with chest pain (Family Medicine) • Hypertensive retinopathy (Eye) • ECG Changes (MI, Electrical Imbalance, Myocardial hypertrophy) (Medicine) • Overview of acute coronary syndrome & management of heart failure & management of shock (Medicine) • Hypertension (Medicine) • Clinical pharmacology of antihypertensive drugs (Pharmacology) • Cardiovascular changes in pregnancy (Gynae & Obs)			

Categorization of Modular Contents

Anatomy

Category A*	Category B**	Category C***			
		Demonstrations / SGD	**CBL**	**SKL/Practical's**	**Self-Directed Learning (SDL)**
• Embryology	• Histology	• Thoracic Wall / Thoracic Vertebra • Mediastinum • Pericardium • Heart (External Features) • Heart (Internal Features) • Heart (Clinical Correlations) • Vasculature of heart • Innervation of heart • Superior mediastinum • Posterior mediastinum (Contents) • Posterior mediastinum (Azygous system of veins) • Surface marking / Radiology	• Cardiac tamponade • Coarctation of aorta	• Elastic arteries • Medium and small sized arteries • Large veins • Medium and small sized veins	• Thoric Wall / Thoracic Vertebra • Pericidum • Mediastinum • Vasculature of heart • Superior mediastinum • Azygous system of veins

Category A*: By Professor

Category B:** By Associate & Assistant Professors

Category C*:** By Senior Demonstrators & Demonstrators

Teaching Staff / Human Resources of Department of Anatomy

Sr. #	Designation of Teaching Staff / Human Resource	Total Number of Teaching Staff
1.	Professor of Anatomy department	01
2.	Associate Professor	01
3.	Demonstrators of Anatomy department	04

Contact Hours (Faculty)

Sr. #	Hours Calculation for Various Type of Teaching Strategies	Total Hours
1.	Large Group Interactive Session (LGIS)	2 * 10 = 20 hours
2.	Small Group Discussions (SGD)	2*13 =26 hours
3.	Practical / Skill Lab	1.5 * 20 = 30 hours

Contact Hours (Students)

Sr. #	Hours Calculation for Various Type of Teaching Strategies	Total Hours
1.	Large Group Interactive Session (LGIS)	1 * 10 = 10 hours
2.	Small Group Discussions (SGD)	2*13=26 hours
3.	Practical / Skill Lab	1.5 * 4 = 6 hours
4.	Self-Directed Learning (SDL)	2 * 4= 08 hours

Physiology

Category A*	Category B**	Category C***				
LGIS	**LGIS**	**PBL**	**CBL**	**Practical's**	**SGD**	**SDL**
• Short term regulation of blood pressure (**Prof. Dr. Samia Sarwar/Dr Fahad)** • Long term regulation of blood pressure (**Prof. Dr. Samia Sarwar/Dr Fahad)** • Circulatory Shock (**Prof. Dr. Samia Sarwar/Dr Fareed)** • Coronary circulation, Atherosclerosis & acute coronary occlusion • **Prof. Dr. Samia Sarwar/Dr Fahad**	• Cardiac output & its control, measurement of cardiac output, pathologically high and low cardiac output **(By Dr Sidra)** • Cardiac cycle - I, Events of cardiac cycle and its graphical representation **(By Dr Sidra)** • Cardiac cycle – II, Functions of ventricles as pumps, aortic pressure curve, regulation of heart pumping **(By Dr Sidra)** • Cardiac cycle, Events of cardiac cycle and its graphical representation, Functions of ventricles as pumps, aortic pressure curve, regulation of heart pumping (SDL) **By Dr Sidra** • Introduction to CVS **(By Dr Fahad)** • Classification of blood vessels & Biophysical considerations (**By**	One PBL In two sessions	• Pitting edema • Palpitations/Tachycardia	• Examination of arterial pulse • Determination of Jugular Venous Pressure (JVP) • Clinical examination of chest for CVS • Determination of Blood Pressure (BP) • Effect of exercise & posture on arterial blood pressure • Recording of Electrocardiography (ECG) • Cardiopulmonary resuscitation (CPR) Demonstration of Triple Response	1. Concept of vasomotion and starling forces 2. Regulation of blood pressure 3. Cardiac output and Venous return (second week) 4. ECG & its clinical importance (second week) 5. Arrhythmias (third week) 6. Short term regulation of blood pressure (fourth week) 7. Long term regulation of blood pressure (fourth week) 8. Coronary circulation, Atherosclerosis & acute coronary occlusion (fourth week) Cardiac cycle (fourth week)	1. SDL On Campus Heart Sounds 2. Capillary circulation, Concept of vasomotion and starling forces 3. Introduction to ECG & its clinical importance 4. Cardiac cycle - I, Events of cardiac cycle and its graphical representation 5. Arrhythmias 6. Congestive cardiac failure 7. Long term regulation of blood pressure 1. Skeletal muscle blood flow, Cardiovascular changes during exercise 1. SDL Off Campus Introduction to CVS 2. Classification of blood vessels & Biophysical considerations 3. Regulation of

	Dr Aneela) • Heart Sounds (**By Dr Uzma)** • Regulation of blood flow (**By Dr Aneela)** • Capillary circulation, Concept of vasomotion and starling forces (**By Dr Fahad)** • Functions of veins, Venous return and factors affecting venous return (**By Dr Kamil)** • Introduction to ECG & its clinical importance (**By Dr Fahad)** • Vectorial analysis & arrhythmias I **(By Dr Fahad)** • Arrhythmias II **(By Dr Fahad)** • ECG changes in myocardial hypertrophies, ischemic heart disease **(By Dr Fahad)** • Congestive cardiac failure **(By Dr Fareed)** • Splanchnic circulation, cutaneous circulation **(By Dr Fareed)** • Skeletal muscle blood flow, Cardiovascular					blood flow 4. Introduction to ECG & its clinical importance 5. Vectorial analysis & arrhythmias 6. Cardiac cycle 7. Splanchnic circulation, cutaneous circulation Regulation of blood pressure

	changes during exercise • **(By Dr Uzma)** • Fetal circulation & cardiac abnormalities in fetal circulation • **(By Dr Fahad)**					

Category A*: By HOD and Associate Professor

Category B:** By All (HOD, Associate, Assistant, Senior Demonstrators)

Category C*:** By Demonstrators and Residents

Teaching Staff / Human Resource of Department of Physiology

Sr. #	Designation Of Teaching Staff / HumanResource	Total number ofteaching staff
1.	Professor of physiology department	01
2.	Associate professor of physiology department	01
3.	Assistant professor of physiology department (AP)	01
4.	Demonstrators of physiology department	07
5.	Residents of physiology department (PGTs)	06

Contact Hours (Faculty) & Contact Hours (Students)

Sr. #	Hours Calculation for Various Type of Teaching Strategies	Total Hours
1.	Large Group Interactive Session (LECTURES)	22X1 =22 Hours
2.	Small Group Discussions (SGD)/CBL	1.5X4 =6 Hours + 8 Hours (2nd,3rd ,4th week) = 14 Hours
3.	Problem Based Learning (PBL)	---
4.	Practical / Skill Lab	1.5X4 =6 Hours
5.	Self-Directed Learning (SDL)	8x1 = 8 Hours (On Campus) 8x1 = 8 Hours (Off Campus)

Biochemistry

Category A*	Category B**				
LGIS	**LGIS**	**PBL**	**CBL**	**Practical's**	**SGD**
• Simple Lipids • Compound Lipids (phospholipids, glycolipids, lipoproteins) • Prostaglandins	• Definition and Biological importance of Lipids • Fatty acids • Derived lipids • Cholesterol • Introduction and classification of carbohydrates • Isomerism, optical activity and mutarotation • Monosaccharide • Disaccharides • Homopolysaccharides • Heteropolysaccharides		• Atherosclerosis • Heteropolysaccharides	• Lipid solubility • Benedict's test and Molisch's test • Barfoed's Test and Selivanoff's test • Iodine Test	• Classification of carbohydrates and lipids • Classification and properties of fatty acids

Category A*: By HOD and Assistant Professor

Category B:** By All (HOD, Assistant Professors, Senior Demonstrators)

Category C*:** (By All Demonstrators)

Teaching Staff / Human Resource of Department of Biochemistry

Sr. #	Designation of Teaching Staff / Human Resource	Total number of teaching staff
1	Assistant professor of biochemistry department (AP)	01
2	Demonstrators of biochemistry department	07

Contact Hours (Faculty) & Contact Hours (Students)

Sr. #	Hours Calculation for Various Type of Teaching Strategies	Total Hours (Faculty)	Total Hours (student)
1.	Large Group Interactive Session (LECTURES)	2 * 8 = 16 hours	08
2.	Small Group Discussions (SGD)	1.5 * 5 = 7.5hours	06
3.	Problem Based Learning (PBL)	Zero	zero
4.	Practical / Skill Lab	1.5 * 5= 7.5hours	6
5.	Self-Directed Learning (SDL)	----------	08

Timetable For CVS Module
28-08-2023 TO 02-09-2023 (First Week)

DAY/ TIME	8:00AM-9:00AM	09:00AM-10:00AM	10:00AM-11:00AM	11:00AM-12:00 PM	12:00PM-12:20PM	12:20PM-02:00PM	Home Assignment (2 Hours)
28-08-2023 MONDAY	**DISSECTION/SGD**		**COMMUNITY MEDICINE (LGIS)**	**PHYSIOLOGY (LGIS)**	B R E A K	Practical &CBL Topics mentioned at the end	SDL Physiology Introduction to CVS
	Thoracic Wall / Thoracic Vertebra		Risk factors of coronary vascular disease	Introduction to CVS / Classification of Blood vessels & Biophysical considerations			
			Dr Rizwana (Even) / Dr Asif (Odd)	Dr Fahad (Even) / Dr. Aneela (Odd)			
29-08-2023 TUESDAY	**Behavioural Sciences**	**BIOCHEMISTRY (LGIS)**	**ANATOMY (LGIS)**	**PHYSIOLOGY (LGIS)**		Practical &CBL Topics mentioned at the end	SDL Physiology Classification of Blood vessels & Biophysical considerations
	Breaking the bad news	Introduction and classification of carbohydrates & Isomerism / Introduction and classification of lipids &Fatty acids	Development of CVS (Development of Veins) / General Anatomy of CVS (General Organization)	Classification of Blood vessels & Biophysical considerations / Introduction to CVS			
	Dr. Sadia Yasir (Even) / Dr. Zarnain (Odd)	Dr. Isma (Even) / Dr. Uzma Zafar (Odd)	Prof. Dr. Ayesha (Even) / Assist. Prof. Dr. Arsalan (Odd)	Dr. Aneela (Even) / Dr Fahad (Odd)			
30-08-2023 WEDNESDAY	**BIOCHEMISTRY (LGIS)**	PYYSICAL ACTIVITY	**ANATOMY (LGIS)**	**DME ORIENTATION SESSION**		Practical &CBL Topics mentioned at the end	SDL Biochemistry Classification & functions of carbohydrates
	Introduction and classification of lipids &Fatty acids / Introduction and classification of carbohydrates & Isomerism		General Anatomy of CVS (General Organization) / Development of CVS (Development of Veins)	Paper discussion / Module orientation & discussion on feedback			
	Dr. Uzma Zafar (Even) / Dr. Isma (Odd)		Assist. Prof. Dr. Arsalan (Even) / Prof. Dr. Ayesha (Odd)	All departments (Even) / Dr Sidra / Dr. Saira			
31-08-2023 THURSDAY	**DISSECTION/SGD**	**PHYSIOLOGY (LGIS)**	**ANATOMY (LGIS)**	**PHYSIOLOGY SDL No. 01**		Practical &CBL Topics mentioned at the end	SDL Biochemistry Classification & functions of lipids
	Mediastinum (General Features & Divisions)	Heart sounds / Regulation of blood flow	General Anatomy of CVS (Classification of) / Development of CVS (Aortic Arches and)	Heart sounds			
		Dr. Uzma(even) / Dr. Aneela (Odd)	Assist. Prof. Dr. Arsalan (Even) / Prof. Dr. Ayesha (Odd)	Dr. Uzma (even) / Dr. Iqra (Odd)			
01-09-2023 FRIDAY	**QURAN TRANSLATION-I**	**QURAN TRANSLATION-II**	**PHYSIOLOGY (LGIS)**	**DME ORIENTATION SESSION**		SDL Anatomy Thoracic Wall / Thoracic Vertebrae	
	Mumamalat-I / muashrat-II	muashrat-II / Mumamalat-I	Regulation of blood flow / Heart sounds	Module orientation & discussion on feedback / Paper discussion			
	Mufti Naeem (Even) / Molana Abdul Wahid (Odd)	Molana Abdul Wahid (Even) / Mufti Naeem (Odd)	Dr. Aneela (even) / Dr. Uzma (Odd)	Dr Sidra / Dr. Saira / All departments (Odd)			
02-09-2023 SATURDAY	**DISSECTION/CBL**		**RADIOLOGY (LGIS)**	**PHYSIOLOGY (LGIS)**	B R E A K	Practical &CBL Topics mentioned at the end	SDL Anatomy Pericardium/ Mediastinum
	Pericardium / CBL		Chest radiograph with perspective of cardiovascular system	Capillary circulation, Concept of vasomotion and starling forces / Functions of veins, Venous return and factors affecting venous return			
			Dr Aniqua (even) / Dr. Fiza (even)	Dr. Fahad (Even) / Dr. Kamil (Odd)			

Topics for Practical with Venue	Topics for Small Group Discussion& CBLs
• Elastic Arteries (Anatomy/ Histology-practical) venue Histology Laboratory • Lipid solubility (Biochemistry practical) venue- Biochemistry Laboratory • Examination of arterial pulse (Physiology –practical) Physiology Laboratory • Determination of Jugular Venous Pressure (JVP) (Physiology –practical) Physiology Laboratory	• Biochemistry tutorial – classification of carbohyrates and lipids • Concept of vasomotion and starling forces. (SGD) (Physiology Lecture Hall No.05)

Schedule for Practical / Small Group Discussion

Day	Histology Practical	Biochemistry Practical	Physiology Practical	Physiology SGD	Biochemistry SGD
Monday	**C**	**B**	**E**	**A**	**D**
Tuesday	**D**	**C**	**A**	**B**	**E**
Wednesday	**E**	**D**	**B**	**C**	**A**
Thursday	**B**	**A**	**D**	**E**	**C**
Saturday	**A**	**E**	**C**	**D**	**B**

Venue For First Year Batches for Anatomy Dissection / Small Group Discussion

Batches	Roll No	Anatomy Teacher	Venue
A	1-90	Dr Ali Raza	Lecture Hall No.04 (Anatomy)
B	91-180	Dr. Quratulain Shareef	Lecture Theatre Complex No.03
C	180-270	Dr. Zaneera Saqib	Lecture Theatre Complex No.02
D	271 onwards	Dr Urooj Shah	Lecture Hall No. 03 (Anatomy)

Venue For First Year Batches For PBL &SGD Team-I

Batches	Roll No	Venue	
Batch-A1	(01-35)	New Lecture Hall Complex Lecture no.02	Dr. Sheena Tariq
Batch-A2	(36-70)	New Lecture Hall Complex Lecture no.03	Dr. Uzma Kiani
Batch-B1	(71-105)	Lecture Hall no.02(Basement)	Dr. Fahd Anwar
Batch-B2	(106-140)	Conference room (Basement)	Dr. Fareedullah
Batch-C1	(141-175)	Lecture Hall no.04(Basement)	Dr. Maryam Abbas (PGT Physiology)
Batch-C2	(176-210)	Lecture Hall no.05(Basement)	Dr. Nayab (PGT Physiology)
Batch-D1	(210-245)	Lecture Hall no.03 (First Floor)	Dr. Iqra Ayub (PGT Physiology)
Batch-D2	(246-280)	Anatomy Museum (First Floor Anatomy)	Dr. Romesa (PBL)
Batch-E1	(281-315)	Lecture Hall no.04 (First Floor Anatomy)	Dr. Afsheen (pgt physiology)
Batch-E2	(315 onwards)	Lecture Hall no.05Physiology	Dr. Uzma Zafar (PBL) Dr. Kamil Tahir (SGD)

Sr. No	Batch	Roll no	Names of Teachers	
			Biochemistry	Physiology
1.	Batch – A	01-70	Dr. Almas Ijaz	Dr. Sheena Tariq
2.	Batch –B	71-140	Dr. Rahat Afzal	Dr. Uzma Kiani
3.	Batch –C	141-210	Dr. Romessa Naeem	Dr. Fahd Anwar
4.	Batch –D	211-280	Dr. Uzma Zafar	Dr. Maryam Abbas & Dr. Nayab Zonish
5.	Batch -E	281-onwards	Dr. Nayab	Dr. Fareed

Venues for Large Group Interactive Session (LGIS) and SDL

Odd Roll Numbers	New Lecture Hall Complex Lecture Theater # 03
Even Roll Number	New Lecture Hall Complex Lecture Theater # 02

Timetable For CVS Module
04-09-2023 TO 09-09-2023 (Second Week)

DAY/ TIME	8:00AM-9:00AM	09:00AM-10:00AM	10:00AM-11:00AM		11:00AM-12:00 PM		12:00PM-12:20PM	12:20PM-02:00PM	Home Assignment (2 Hours)
04-09-2023 MONDAY	**DISSECTION/CBL**		**ANATOMY (LGIS)**		**PHYSIOLOGY (LGIS)**		B R E A K	Practical &CBL Topics mentioned at the end	SDL Physiology Regulation of blood flow
	Heart (External Features)		Development of CVS (Aortic Arches and derivatives)	General Anatomy of CVS (Classification of vessels)	Functions of veins, Venous return and factors affecting venous return	Capillary circulation, Concept of vasomotion and starling forces			
			Prof. Dr. Ayesha (Even)	Assist. Prof. Dr. Arsalan (Odd)	Dr Kamil (Even)	Dr Fahad (Odd)			
05-09-2023 TUESDAY	**DISSECTION/SGD**		**PATHOLOGY (LGIS)**		**PHYSIOLOGY (LGIS)**			Practical &CBL Topics mentioned at the end	SDL Physiology Introduction to ECG & its clinical importance
	Heart (Internal Features)		Edema		Capillary circulation, Concept of vasomotion and starling forces (SDL)	Cardiac output & its control, measurement of cardiac output, pathologically high and low cardiac output-I			
			Dr Fariha (Even)	Dr Rabia (Odd)	Dr Maryam (Even)	Dr Sidra (Odd)			
06-09-2023 WEDNESDAY	**DISSECTION/SGD**		**ANATOMY (LGIS)**		**PHYSIOLOGY (LGIS)**			Practical &CBL Topics mentioned at the end	SDL Biochemistry Fatty acids & Simple lipids
	Heart (Clinical Correlations of Heart)		Histology of CVS (Arteries and Veins)	Development of CVS (Formation, Position and Partitioning of heart tube)	Cardiac output & its control, measurement of cardiac output, pathologically high and low cardiac output-II	Introduction to ECG & its clinical importance			
			Assoc. Prof. Dr. Mothashim (Even)	Prof. Dr. Ayesha (Odd)	Dr. Sidra (Odd)	Dr Fahd (Even)			
07-09-2023 THURSDAY	HOLIDAY							Practical &CBL Topics mentioned at the end	SDL Biochemistry Classification and Chemical reactions of Monosaccharides
08-09-2023 FRIDAY	**QURAN TRANSLATION -III**		**QURAN TRANSLATION -IV**		**PHYSIOLOGY (LGIS)**			Practical &CBL Topics mentioned at the end	SDL Anatomy Heart
	Mumamalat -II	Ekhlaqiaat-I	Ekhlaqiaat-I	Mumamalat-II	Vectorial analysis & arrhythmias I	Cardiac cycle - I, Events of cardiac cycle and its graphical representation			
	Mufti Naeem (even)	Molana Abdul Wahid (Odd)	Molana Abdul Wahid (even)	Mufti Naeem (Odd)	Dr. Fahad (even)	Dr Sidra (Odd)			
09-09-2023 SATURDAY	**BEHAVIOUR SCIENCES**		**BIOCHEMISTRY (LGIS)**		Practical (Skill Lab) / SGD(CBL) Dated 07-09-2023 Thursday batches		**PHYSIOLOGY (LGIS)**		B R E A K	Practical &CBL Topics mentioned at the end	SDL Anatomy Vassculature of Heart
	Stigma to mental illness		Simple lipids & Compound lipids	Mutarotation & Monosaccharides & their chemical reaction			Cardiac cycle - I, Events of cardiac cycle and its graphical representation	Vectorial analysis & arrhythmias I			
	Dr. Azeem Rao (Even)	Dr. Quratulain (Odd)	Dr. Aneela (even)	Dr. Isma (Odd)			Dr Sidra (even)	Dr.Fahd (Odd)			

Topics For Practical With Venue	Topics For Small Group Discussion& CBLs With Venue
• Medium & Small Sized Arteries (Anatomy/ Histology-practical) venue Histology Laboratory Molisch's Test & Benedict's Test (Biochemistry practical) venue- Biochemistry Laboratory • Clinical examination of chest for CVS (Physiology –practical) Physiology Laboratory • Determination of Blood Pressure (BP) (Physiology –practical) Physiology Laboratory	• Biochemistry tutorial – Classification & Properties of Fatty Acids. (Biochemistry Basement demo room) Physiology CBL- Pitting edema (Physiology Lecture Hall No.05)

Schedule For Practical / Small Group Discussion

Day	Histology Practical	Biochemistry Practical	Physiology Practical	Physiology SGD	Biochemistry SGD
Monday	**C**	**B**	**E**	**A**	**D**
Tuesday	**D**	**C**	**A**	**B**	**E**
Wednesday	**E**	**D**	**B**	**C**	**A**
Thursday	**B**	**A**	**D**	**E**	**C**
Saturday	**A**	**E**	**C**	**D**	**B**

Venue For First Year Batches For Anatomy Dissection / Small Group Discussion

Batches	Roll No	Anatomy Teacher	Venue
A	1-90	Dr Ali Raza	Lecture Hall No.04 (Anatomy)
B	91-180	Dr. Quratulain Shareef	Lecture Theatre Complex No.03
C	180-270	Dr. Zaneera Saqib	Lecture Theatre Complex No.02
D	271 onwards	Dr Urooj Shah	Lecture Hall No. 03 (Anatomy)

Venue For First Year Batches For PBL &SGD Team-I

Batches	Roll No	Venue	
Batch-A1	(01-35)	New Lecture Hall Complex Lecture no.02	Dr. Sheena Tariq
Batch-A2	(36-70)	New Lecture Hall Complex Lecture no.03	Dr. Uzma Kiani
Batch-B1	(71-105)	Lecture Hall no.02(Basement)	Dr. Fahd Anwar
Batch-B2	(106-140)	Conference room (Basement)	Dr. Fareedullah
Batch-C1	(141-175)	Lecture Hall no.04(Basement)	Dr. Maryam Abbas (PGT Physiology)
Batch-C2	(176-210)	Lecture Hall no.05(Basement)	Dr. Nayab (PGT Physiology)
Batch-D1	(210-245)	Lecture Hall no.03 (First Floor)	Dr. Iqra Ayub (PGT Physiology)
Batch-D2	(246-280)	Anatomy Museum (First Floor Anatomy)	Dr. Romesa (PBL)
Batch-E1	(281-315)	Lecture Hall no.04 (First Floor Anatomy)	Dr. Afsheen (PGT Physiology)
Batch-E2	(315 onwards)	Lecture Hall no.05Physiology	Dr. Uzma Zafar (PBL) Dr. Kamil Tahir (SGD)

Sr. No	Batch	Roll no	Names of Teachers	
			Biochemistry	Physiology
1.	Batch – A	01-70	Dr. Almas Ijaz	Dr. Sheena Tariq
2.	Batch –B	71-140	Dr. Rahat Afzal	Dr. Uzma Kiani
3.	Batch –C	141-210	Dr. Romessa Naeem	Dr. Fahd Anwar
4.	Batch –D	211-280	Dr. Uzma Zafar	Dr. Maryam Abbas & Dr. Nayab Zonish
5.	Batch -E	281-onwards	Dr. Nayab	Dr. Fareed

Venues for Large Group Interactive Session (LGIS) and SDL

Odd Roll Numbers	New Lecture Hall Complex Lecture Theater # 03
Even Roll Number	New Lecture Hall Complex Lecture Theater # 02

Timetable For CVS Module
11-09-2023 TO 15-09-2023 (Third Week)

DAY/ TIME	8:00AM-9:00AM	09:00AM-10:00AM	10:00AM-11:00AM		11:00AM-12:00 PM		12:00PM-12:20PM	12:20PM-02:00PM	Home Assignment (2 Hours)
11-09-2023 MONDAY	**DISSECTION/CBL**		**ANATOMY (LGIS)**		**PHYSIOLOGY (LGIS)**		B R E A K	Practical &CBL Topics mentioned at the end	SDL Physiology Regulation of BP
	Vassculature of Heart / CBL		Development of CVS (Formation, Position and Partitioning of heart tube)	Histology of CVS (Arteries and Veins)	Arrhythmias II	Cardiac cycle – II, Functions of ventricles as pumps, aortic pressure curve, regulation of heart pumping			
			Prof. Dr. Ayesha (even)	Assoc. Prof. Dr. Mothashim (Odd)	Dr. Fahd (Even)	Dr. Sidra (Odd)			
12-09-2023 TUESDAY	**DISSECTION/SGD**		**ANATOMY (LGIS)**		**PHYSIOLOGY (LGIS)**			Practical CBL Topics mentioned at the end	SDL Physiology Regulation of BP
	Innervation of Heart		Development of CVS (Formation and partitioning of Ventricles)	Histology of CVS (Capillaries)	Cardiac cycle – II, Functions of ventricles as pumps, aortic pressure curve, regulation of heart pumping	Arrhythmias II			
			Prof. Dr. Ayesha (Even)	Assoc. Prof. Dr. Mothashim (Odd)	Dr. Sidra (Even)	Dr. Fahd (Odd)			
13-09-2023 WEDNESDAY	**BIOCHEMISTRY (LGIS)**		**FAMILY MEDICINE**	**ANATOMY (LGIS)**		**PHYSIOLOGY (LGIS)**		Practical &CBL Topics mentioned at the end	SDL Biochemistry Disaccharides Online SDL Evaluation
	Derived lipids	Disaccharides &homopolysaccharides	Approach to a patient with chest pain	Histology of CVS (Capillaries)	Development of CVS (Formation and partitioning of Ventricles)	ECG changes in myocardial hypertrophies, ischemic heart disease	Short term regulation of blood pressure		
	Dr. Kahif (even)	Dr. Isma (Odd)	Dr Sadia khan	Assoc. Prof. Dr. Mothashim (Even)	Prof. Dr. Ayesha (Odd)	Dr. Fahd(Even)	Prof..Dr. Samia / Dr.Kamil (Odd)		
14-09-2023 THURSDAY	**ANATOMY (SGD)**		**ARTIFICIAL INTELLIGENCE**		**PHYSIOLOGY (LGIS)**			Practical &CBL Topics mentioned at the end	SDL Biochemistry Compound lipids
	Superior Mediastinum (Trachea, Esophagus Ascending Aorta)		Guest Lecture		Short term regulation of blood pressure	ECG changes in myocardial hypertrophies, ischemic heart disease			
			Dr. Syed Safwan Khalid		Prof..Dr. Samia / Dr. Kamil (Even)	Dr. Fahd (Odd)			
15-09-2023 FRIDAY	**EYE (LGIS)**		**BIOCHEMISTRY (LGIS)**		**ANATOMY (LGIS)**				
	Hypertensive Retinopathy		Disaccharides &homopolysaccharides	Derived lipids	Development of CVS (Fetal Circulation)	Histology of CVS (Tunics of heart & Lyphatic System)		SDL Anatomy Innervation of Heart	
	Dr. Sehar Umer (Even)	Dr. Saira Bano (Odd)	Dr. Isma (Even)	Dr. Kahif (Odd)	Prof. Dr. Ayesha (Even)	Assoc. Prof. Dr. Mothashim (Odd)			
16-09-2023 SATURDAY	**DISSECTION/SGD**		**RESEARCH CLUB ACTIVITY**		**PHYSIOLOGY (LGIS)**		BREAK	Practical &CBL Topics mentioned at the end	SDL Anatomy Superior Mediastinum
	Posterior mediastinum (Contents)		IUGRC		Long term regulation of blood pressure	Congestive cardiac failure			
					Prof.Dr. Samia /Dr.Kamil (Even)	Dr. Fareed (Odd)			

Topics For Practical With Venue	Topics For Small Group Discussion& CBLs With Venue
• Large Veins (Anatomy/ Histology-practical) venue Histology Laboratory • Selivanoff's Test & Barfoed's Test (Biochemistry practical) venue- Biochemistry Laboratory • Effect of exercise and posture on arterial blood pressure (Physiology –practical) Physiology Laboratory • Recording of Electrocardiography (ECG) (Physiology –practical). Physiology Laboratory	• Biochemistry CBL- Atherosclerosis. • Physiology CBL Palpitations / Tachycardia (Physiology Lecture Hall No.05)

Schedule For Practical / Small Group Discussion

Day	Histology Practical	Biochemistry Practical	Physiology Practical	Physiology SGD	Biochemistry SGD
Monday	**C**	**B**	**E**	**A**	**D**
Tuesday	**D**	**C**	**A**	**B**	**E**
Wednesday	**E**	**D**	**B**	**C**	**A**
Thursday	**B**	**A**	**D**	**E**	**C**
Saturday	**A**	**E**	**C**	**D**	**B**

Venue For First Year Batches For Anatomy Dissection / Small Group Discussion

Batches	Roll No	Anatomy Teacher	Venue
A	1-90	Dr Ali Raza	Lecture Hall No.04 (Anatomy)
B	91-180	Dr. Quratulain Shareef	Lecture Theatre Complex No.03
C	180-270	Dr. Zaneera Saqib	Lecture Theatre Complex No.02
D	271 onwards	Dr Urooj Shah	Lecture Hall No. 03 (Anatomy)

Venue For First Year Batches For PBL &SGD Team-I

Batches	Roll No	Venue	
Batch-A1	(01-35)	New Lecture Hall Complex Lecture no.02	Dr. Sheena Tariq
Batch-A2	(36-70)	New Lecture Hall Complex Lecture no.03	Dr. Uzma Kiani
Batch-B1	(71-105)	Lecture Hall no.02(Basement)	Dr. Fahd Anwar
Batch-B2	(106-140)	Conference room (Basement)	Dr. Fareedullah
Batch-C1	(141-175)	Lecture Hall no.04(Basement)	Dr. Maryam Abbas (PGT Physiology)
Batch-C2	(176-210)	Lecture Hall no.05(Basement)	Dr. Nayab (PGT Physiology)
Batch-D1	(210-245)	Lecture Hall no.03 (First Floor)	Dr. Iqra Ayub (PGT Physiology)
Batch-D2	(246-280)	Anatomy Museum (First Floor Anatomy)	Dr. Shahrukh (PBL)
Batch-E1	(281-315)	Lecture Hall no.04 (First Floor Anatomy)	Dr. Afsheen (PGT Physiology)
Batch-E2	(315 onwards)	Lecture Hall no.05Physiology	Dr. Uzma Zafar (PBL) Dr. Kamil Tahir (SGD)

Sr. No	Batch	Roll no	Names of Teachers	
			Biochemistry	Physiology
1.	Batch – A	01-70	Dr. Almas Ijaz	Dr. Sheena Tariq
2.	Batch –B	71-140	Dr. Rahat Afzal	Dr. Uzma Kiani
3.	Batch –C	141-210	Dr. Romessa Naeem	Dr. Fahd Anwar
4.	Batch –D	211-280	Dr. Uzma Zafar	Dr. Maryam Abbas & Dr. Nayab Zonish
5.	Batch -E	281-onwards	Dr. Nayab	Dr. Fareed

Venues for Large Group Interactive Session (LGIS) and SDL

Odd Roll Numbers	New Lecture Hall Complex Lecture Theater # 03
Even Roll Number	New Lecture Hall Complex Lecture Theater # 02

Timetable For CVS Module
18-09-2023 TO 22-09-2023 (Fourth Week)

DAY/ TIME	8:00AM-9:00AM	09:00AM-10:00AM	10:00AM-11:00AM	11:00AM-12:00 PM	12:00PM-12:20PM	12:20PM-02:00PM	Home Assignment (2 Hours)
18-09-2023 MONDAY	**MEDICINE** Overview of acute coronary syndrome & Management of heart failure & Management of shock Dr. Asad cardiologist (Even / Dr. Hasnain (Odd)	**PHYSIOLOGY (LGIS)** Splanchnic circulation, cutaneous circulation / Skeletal muscle blood flow, Cardiovascular changes during exercise Dr.Fareed(Even) / Dr Uzma (Odd)	Practical (Skill Lab) / SGD(CBL) Dated 23-09-2023 Saturday batches	**PHYSIOLOGY (LGIS)** Fetal circulation & cardiac abnormalities in fetal circulation / Circulatory shock Dr.Fahad (Even) / Prof. Dr. Samia Sarwar / Dr. Fareed (Odd)	B R E A K	Practical &CBL Topics mentioned at the end	SDL Physiology Vectorial analysis & arrhythmias
19-09-2023 TUESDAY	**MEDICINE(LGIS)** Hypertension Dr. Asad cardiologist (Even) / Dr. Hasnain (Odd)	**PHYSIOLOGY (LGIS)** Skeletal muscle blood flow, Cardiovascular changes during exercise / Splanchnic circulation, cutaneous circulation Dr.Uzma(Even) / Dr. Fareed (Odd)	**ANATOMY (LGIS)** Histology of CVS (Tunics of heart & Lyphatic System) / Development of CVS (Fetal Circulation) Assoc. Prof. Dr. Mothashim (Even) / Prof. Dr. Ayesha (Odd)	**PHYSIOLOGY (LGIS)** Circulatory shock / Fetal circulation & cardiac abnormalities in fetal circulation Prof. Dr. Samia Sarwar / Dr. Fareed (Even) / Dr.Fahad (Odd)		Practical &CBL Topics mentioned at the end	SDL Physiology Cardiac cycle Online ClinicalEvaluation
20-09-2023 WEDNESDAY	**PHARMACOLOGY** Clinical Pharmacology of Anti hypertensive drugs (Even) / (Odd)	**BIOCHEMISTRY(LGIS)** Heteropolysaccharides / Prostaglandins Dr. Isma (even) / Dr. Aneela (Odd)	**GYNAE & OBS (LGIS)** Hypertensive disorders in pregnancy (gestational hypertension, pre-eclampsia) Dr. Saima Khan(Even) / Dr. Sadia Bano (Odd)	**PHYSIOLOGY (LGIS)** Coronary circulation, Atherosclerosis & acute coronary occlusion / Long & Short term regulation of blood pressure Prof..Dr. Samia/ Dr. kamil (Even) / Dr. Najam SDL (Odd)		Practical &CBL Topics mentioned at the end	SDL Biochemistry Prostaglandins
21-09-2023 THURSDAY	**DISSECTION/SGD** Posterior Mediastinum (Azygous system of Veins)		**BIOCHEMISTRY(LGIS)** Prostaglandins / Heteropolysaccharides Dr. Aneela (even) / Dr. Isma (Odd)	**PHYSIOLOGY (LGIS)** Long & Short term regulation of blood pressure / Coronary circulation, Atherosclerosis & acute coronary occlusion Dr. Najam SDL (Even) / Prof. Dr. Samia/ Dr.Kamil (Odd)		Practical &CBL Topics mentioned at the end	SDL Biochemistry Heteropoly saccharides
22-09-2023 FRIDAY	**PHYSIOLOGY (SDL)** Skeletal muscle blood flow, Cardiovascular changes during exercise Dr. Uzma	**Physical Activitty**	**DISSECTION/SGD** Surface Marking / Radiology			SDL Anatomy Posterior Mediastinum	SDL PATHOLOGY Shock
23-09-2023 SATURDAY	SDL				**Break**		SDL Anatomy Azygous System of Veins

Topics For Practical With Venue	Topics For Small Group Discussion& CBLs With Venue
• Medium & Small Sized Veins (Anatomy/ Histology-practical) venue Histology Laboratory • Iodine Test (Biochemistry practical) venue- Biochemistry Laboratory • Cardiopulmonary resuscitation (CPR) (Physiology –practical) Physiology Laboratory • Demonstration of Triple Response (Physiology –practical) (Physiology Physiology Laboratory	• Biochemistry Heteropolysaccharides CBL (Biochemistry Basement demo room) • Physiology tutorial- Regulation of blood pressure (Physiology Lecture Hall No.05)

Schedule For Practical / Small Group Discussion

Day	Histology Practical	Biochemistry Practical	Physiology Practical	Physiology SGD	Biochemistry SGD
Monday	**C**	**B**	**E**	**A**	**D**
Tuesday	**D**	**C**	**A**	**B**	**E**
Wednesday	**E**	**D**	**B**	**C**	**A**
Thursday	**B**	**A**	**D**	**E**	**C**
Saturday	**A**	**E**	**C**	**D**	**B**

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B	91-180	Dr. Quratulain Shareef	Lecture Theatre Complex No.03
C	180-270	Dr. Zaneera Saqib	Lecture Theatre Complex No.02
D	271 onwards	Dr Urooj Shah	Lecture Hall No. 03 (Anatomy)

Venue For First Year Batches For PBL &SGD Team-I

Batches	Roll No	Venue	
Batch-A1	(01-35)	New Lecture Hall Complex Lecture no.02	Dr. Sheena Tariq
Batch-A2	(36-70)	New Lecture Hall Complex Lecture no.03	Dr. Uzma Kiani
Batch-B1	(71-105)	Lecture Hall no.02(Basement)	Dr. Fahd Anwar
Batch-B2	(106-140)	Conference room (Basement)	Dr. Fareedullah
Batch-C1	(141-175)	Lecture Hall no.04(Basement)	Dr. Maryam Abbas (PGT Physiology)
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Batch-D2	(246-280)	Anatomy Museum (First Floor Anatomy)	Dr. Romesa (PBL)
Batch-E1	(281-315)	Lecture Hall no.04 (First Floor Anatomy)	Dr. Afsheen (PGT Physiology)
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2.	Batch –B	71-140	Dr. Rahat Afzal	Dr. Uzma Kiani
3.	Batch –C	141-210	Dr. Romessa Naeem	Dr. Fahd Anwar
4.	Batch –D	211-280	Dr. Uzma Zafar	Dr. Maryam Abbas & Dr. Nayab Zonish
5.	Batch -E	281-onwards	Dr. Nayab	Dr. Fareed

Venues for Large Group Interactive Session (LGIS) and SDL

Odd Roll Numbers	New Lecture Hall Complex Lecture Theater # 03
Even Roll Number	New Lecture Hall Complex Lecture Theater # 02

Next Week Will Be Assessment Week. The Detail of Assessment Week Will Be Shared Once Finalized.

Timetable for CVS Module
25-09-2023 TO 30-09-2023 (Fifth Week)

DAY/ TIME	8:00AM-9:0AM	02:00pm – 03:00pm
25-09-2023 MONDAY	ANATOMY /PHYSIOLOGY VIVA VOCE	
26-09-2023 TUESDAY	ANATOMY /PHYSIOLOGY VIVA VOCE	
27-09-2023 WEDNESDAY	ANATOMY THEORY PAPER	
28-09-2023 THURSDAY	SDL	
29-09-2023 FRIDAY	PHYSIOLOGY THEORY PAPER	
30-09-2023 SATURDAY	BIOCHEMISTRY THEORY PAPER & ALLIEDs	

SECTION VI

Table of Specification (TOS) For CVS Module Examination

Sr. #	Discipline	No. of MCQs (%)	No. of MCQs according to cognitive domain			No. of SEQs (%)		No. of SEQs according to cognitive domain			Viva voce	Total Marks
			C1	C2	C3	No. of items	Marks	C1	C2	C3		
1.	Anatomy	25	15	5	5	5	25	1	2	2	60	110
2.	Physiology	40	24	12	4	4	20	1	2	1	25	85
3.	Biochemistry	7	4	3	-	3	15	0.5	1.5	-	-	22
4.	Bioethics / Behavioural Sciences	4	-	3	2	-	-	-	-	-	-	4
5.	Research, Artificial Intelligence & Innovation	5	-	3	2	-	-	-	-	-	-	5
6.	Pathology	3	-	2	1	-	-	-	-	-	-	3
7.	Medicine	5	-	3	2	-	-	-	-	-	-	5
8.	Surgery	3	-	2	1	-	-	-	-	-	-	3
9.	Obs & Gynaecology	5	-	3	2	-	-	-	-	-	-	5
10.	Community Medicine	3	-	2	2	-	-	-	-	-	-	4
11.	Family Medicine	1		0	1							1
\Grand Total												246

Annexure I

(Sample MCQ, & SEQ Papers)

RAWALPINDI MEDICAL UNIVERSITY, RWP
ANATOMY DEPARTMENT
1ST YEAR MBBS MCQS CVS MODULE EXAM

1. A medical student while studying a lung specimen noticed number of grooves on the mediastinal surface of left lung, most likely structure producing these grooves is
   a. Azygous vein
   b. Inferior vena cava
   c. Right lymphatic duct
   d. Ascending aorta
   e. Esophagus
2. The structure of right ventricle that lodges RBB of conducting system is
   a. Supraventricular crest
   b. Septomarginal trabeculae
   c. Trabeculae carnii
   d. Septal papillary muscle
   e. Chordate tendinae
3. The direct branches of descending thoracic aorta are
   a. Inferior thyroid artery
   b. left subclavian artery
   c. Internal thoracic artery
   d. Right bronchial artery
   e. Posterior intercostals for 3-11 intercostal spaces
4. In anteroseptal wall MI the posterior 1/3rd of interventricular septum was spared because it receives its blood supply from
   a. Marginal branch of RCA
   b. Anterior descending artery
   c. Posterior descending artery
   d. Circumflex artery
   e. Diagonal artery
5. In anteroseptal wall MI the posterior 1/3rd of interventricular septum was spared because it receives its blood supply from
   a. Marginal branch of RCA
   b. Anterior descending artery
   c. Posterior descending artery
   d. Circumflex artery
   e. Diagonal artery

RAWALPINDI MEDICAL UNIVERSITY

CVS MODULE EXAMINATION

1ST YEAR MBBS

ANATOMY, SEQ'S PAPER

1. a. Give characteristic features of interior of right ventricle. (3)

   b. What is a moderator band? (1)

   c. Define sudden death syndrome. (1)

2. a. Discuss formation and partitioning of heart tube. (3)

   b. Enlist different types of interatrial septal defects. (2)

RAWALPINDI MEDICAL UNIVERSITY

CVS MODULE EXAMINATION

1ST YEAR MBBS

PHYSIOLOGY, MCQ PAPER

1. When the radius of resistance vessels is increased there will be increase in:
   a. Capillary blood flow
   b. Diastolic blood pressure
   c. Hematocrit
   d. Systolic blood pressure
   e. Viscosity of blood

2. Turbulence in a blood vessel is inversely proportional to the:
   a. Viscosity of blood
   b. Velocity of blood flow
   c. Diameter of the vessel
   d. Density of fluid inside the vessel
   e. Reynolds' number

3. A physiologist while teaching the concept of Starling forces directs his students with the subsequent data to calculate the net force. Pressure in the capillary in muscle= 35 mm Hg at the arteriolar end, 14 mm Hg at the venular end. The interstitial pressure= 0 mm Hg. The colloid osmotic pressure is 25 mm Hg in capillary and 1 mm Hg in interstitium. The net force producing fluid movement across the capillary wall at its arteriolar end is:
   a. 10mmHg filtration
   b. 11mmHg filtration
   c. 11mmHg reabsorption
   d. 3mmHg filtration
   e. 3mmHg reabsorption

4. In local control of blood flow the most significant regulatory mechanism is the:
   a. Release of adrenal medullary catecholamines
   b. Local concentration of metabolites
   c. Local concentration of cellular nutrients
   d. Sympathetic activation of blood vessels
   e. Sympathetic inhibition of blood vessels

5. Neural control of circulation predominates over local control in the:
   a. Brain
   b. Heart
   c. Kidney
   d. Skeletal muscle
   e. Skin

RAWALPINDI MEDICAL UNIVERSITY

CVS MODULE EXAMINATION

1ST YEAR MBBS

PHYSIOLOGY, SEQ'S PAPER

Q.1 Draw and label a normal electrocardiogram. Give the normal duration of PR interval, in which condition it is prolonged. (3,2)

Q.2 Define cardiac output. Give its normal values in males and females. Enlist factors causing hypoeffective heart. (2, 3)

RAWALPINDI MEDICAL UNIVERSITY DEPARTMENT OF BIOCHEMISTRY
1ST YEAR MBBS
CVS MODULE

1. The process of interconversion of anomeric forms of sugars is called as
    a. Fermentation
    b. Epimerism
    a. Mutarotation
    c. Ester formation
    d. Autorotation

2. The following is the dimer of glucose only
    a. Sucrose
    b. Lactose
    b. Maltose
    c. Mannose
    d. Ribose

3. The following sugar does not form the osazone crystals
    a. Lactose
    b. Maltose
    c. Glucose
    d. Fructose
    c. Sucrose

4. Cholesterol is involved in the synthesis of the following type of hormones
    a. Peptide
    d. Steroid
    b. Amine derivative
    c. Protein
    d. Glycoprotein

SEQ

Q. a. Define with examples: anomers and epimers. 02

b. Describe structure and functions of glycolipids. 03

RAWALPINDI MEDICAL UNIVERSITY DEPARTMENT OF BIOEHTICS
1ST YEAR MBBS
CVS MODULE

1. ----Includes rules of conduct that may be used to regulate our activities concerning the biological world.
    a. Bio-piracy
    b. Biosafety
    c. Bioethics
    d. Bio-patents
    e. Bio-logistic

2. The right of patients having self-decision is called.
    a. Justice
    b. Autonomy
    c. Beneficence
    d. Veracity
    e. Fidelity

3. Following is not code of ethics.
    a. Integrity
    b. Objectivity
    c. Confidentiality
    d. Behaviour
    e. Autonomy

4. -------in the context of medical ethics, if it's fair and balanced
    a. Justice
    b. Autonomy
    c. Beneficence
    d. Veracity
    e. Fidelity

5. ------Principle requiring that physicians provide, positive benefits
    a. Justice
    b. Autonomy
    c. Beneficence
    d. Veracity
    e. Fidelity