Rawalpindi Medical University
Department of Medical Education (DME)

Study Guide
Cardiovascular System Module 2024

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

Document Revision History

Author(s)	Date	Version	Description
Prof Naeem Akhtar, Dr Ifra Saeed, Dr. Ayesha Yousaf, Dr Sidra Hamid, Dr Tehmina Qamar	2017-2018	1st	Developed for First Year MBBS. Composed of Horizontally and vertically Integrated CVS Module.
Dr Tehzeeb, Dr Samia Sarwar, Dr Ifra Saeed, Dr. Ayesha Yousaf, Dr Tehmina Qamar, Dr Sidra Hamid	2019-2020	2nd	Developed for First Year MBBS. Horizontally and vertically integrated Learning objectives updated
Dr Tehzeeb, Dr Samia Sarwar, , Dr Ifra Saeed, Dr Ayesha Yousaf , Dr Tehmina Qamar, Dr Sidra Hamid	2021-2022	3rd	Developed for First Year MBBS. Horizontally and vertically integrated Learning objectives updated, Research curriculum incorporated
Dr Tehzeeb, Dr Samia Sarwar, Dr Ifra Saeed, Dr Ayesha Yousaf, Dr Tehmina Qamar, Dr Sidra Hamid	2022-2023	4th	Developed for First Year MBBS. Horizontally and vertically integrated Learning objectives updated, Research, Bioethics, Family Medicine curriculum incorporated along with Professionalism
Dr Samia Sarwar, Dr Ifra Saeed, Dr Ayesha Yousaf, Dr Tehmina Qamar, Dr Sidra Hamid	2023-2024	5th	Developed for First Year MBBS. Horizontally and vertically integrated Learning objectives updated, Research curriculum revamped Bioethics, Family Medicine curriculum incorporated along with Professionalism. Entrepreneurship curriculum incorporated

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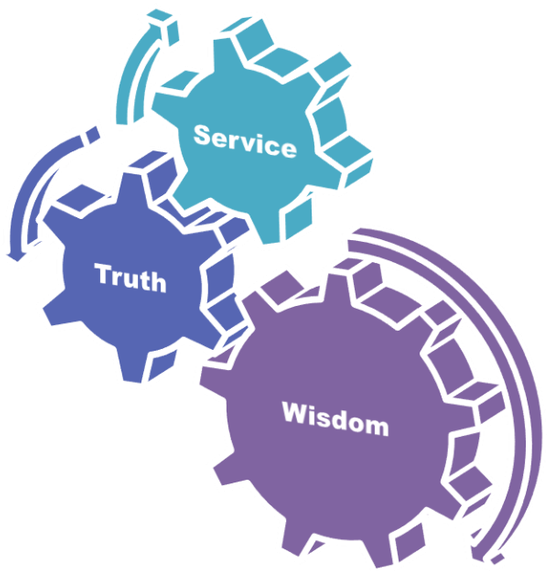
University Moto, Vision, Values & Goals

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:

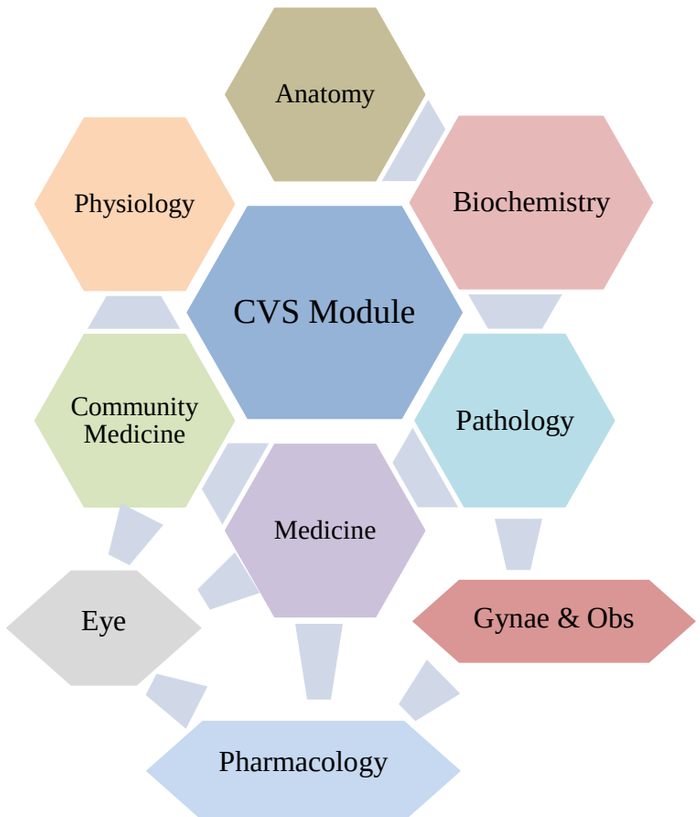
- Provide thorough grounding in the basic theoretical concepts underpinning the practice of medicine.
- Develop and polish the skills required for providing medical services at all levels of the Health care delivery system.
- Help you attain and maintain the highest possible levels of ethical and professional 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 2024

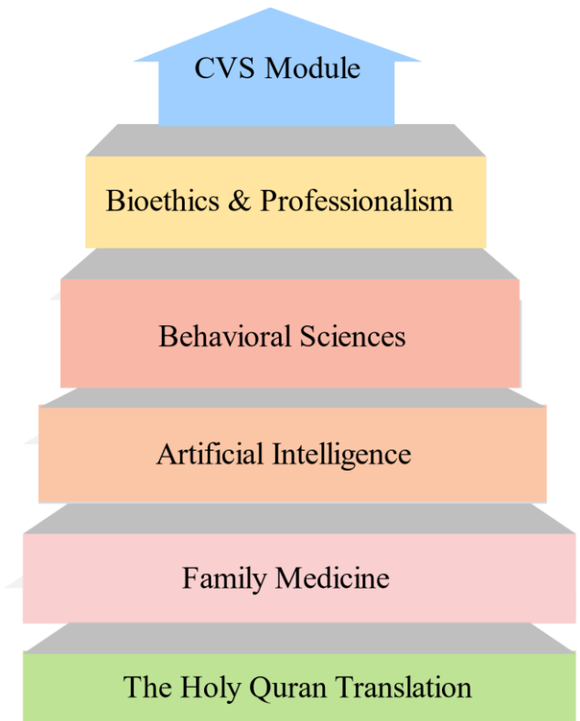
Study Guide

CVS Module

Integration of Disciplines in CVS Module



Spiral / General Education Cluster Courses



Discipline Wise Details of Modular Content

Block	Department	General Anatomy	Embryology	Histology	Gross Anatomy
III	• 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			
	Spiral Courses				
	• The Holy Quran Translation	• Mumamalat-I • Muashrat-II • Ekhlaqiaat-I • Mumamalat -II			
	• Behavioural Sciences, Bioethics & Professionlism	• Breaking the bad news • Stress and its management			
	• 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			
	Vertical Integration				
	• Community Medicine	• Risk factors of coronary vascular disease			
	• Pathology	• Edema			
	• Eye	• Hypertensive retinopathy			
	• Pharmacology	• Clinical Pharmacology of Anti hypertensive drugs			
	• Medicine	• ECG Changes (MI, Electrical Imbalance, Myocardial hypertrophy) • Overview of acute coronary syndrome & management of heart failure & management of shock • Hypertension			
	• Gynae & Obs	• Cardiovascular changes in pregnancy			

		• Hypertensive disorders in pregnancy (gestational hypertension, pre-eclampsia)
	Early Clinical Exposure (ECE)	
	• Cardiology	• See cases of Heart Failure and Dyspnea Raised JVP/Oedema • Clinical Examination of Precordium • Normal Heart Sounds • Additional heart sounds See Cases of Coronary Heart Disease
	• Radiology	• X-Ray chest • Cardiomegaly • Radiological signs of heart failure
	• Pediatrics	• See cases of congenital heart diseases • Pediatric case of Heart Failure

Table of Contents

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.	Chairperson Anatomy & Dean Basic Sciences	Prof. Dr. Ayesha Yousaf
3.	Director DME	Prof. Dr. Ifra Saeed
4.	Chairperson Physiology	Prof. Dr. Samia Sarwar
5.	Chairperson Biochemistry	Dr. Aneela Jamil
6.	Focal Person Anatomy First Year MBBS	Asso. Prof. Dr. Mohtashim Hina
7.	Focal Person Physiology	Dr. Sidra Hamid
8.	Focal Person Biochemistry	Dr. Aneela Jamil
9.	Focal Person Pharmacology	Dr. Zunera Hakim
10.	Focal Person Pathology	Dr. Asiya Niazi
11.	Focal Person Behavioral Sciences	Dr. Saadia Yasir
12.	Focal Person Community Medicine	Dr. Afifa Kulsoom
13.	Focal Person Quran Translation Lectures	Dr. Fahad Anwar
14.	Focal Person Family Medicine	Dr. Sadia Khan

Module Task Force Team		
1.	Coordinator	Dr. Aneela (Senior Demonstrator of Physiology)
2.	DME Focal Person	Dr. Farzana Fatima
3.	Co-coordinator	Dr. Kashif (Senior Demonstrator of Anatomy)
4.	Co-Coordinator	Dr. Romessa Naeem (Demonstrator Biochemistry)
5.	Co-coordinator	Dr. Sheena Tariq (Senior Demonstrator Physiology)

DME Implementation Team		
1.	Director DME	Prof. Dr. Ifra Saeed
2.	Assistant Director DME	Dr. Farzana Fatima
3.	Implementation Incharge 1st & 2nd Year MBBS	Prof. Dr. Ifra Saeed Dr. Farzana Fatima
4.	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

Tables & Figures

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.

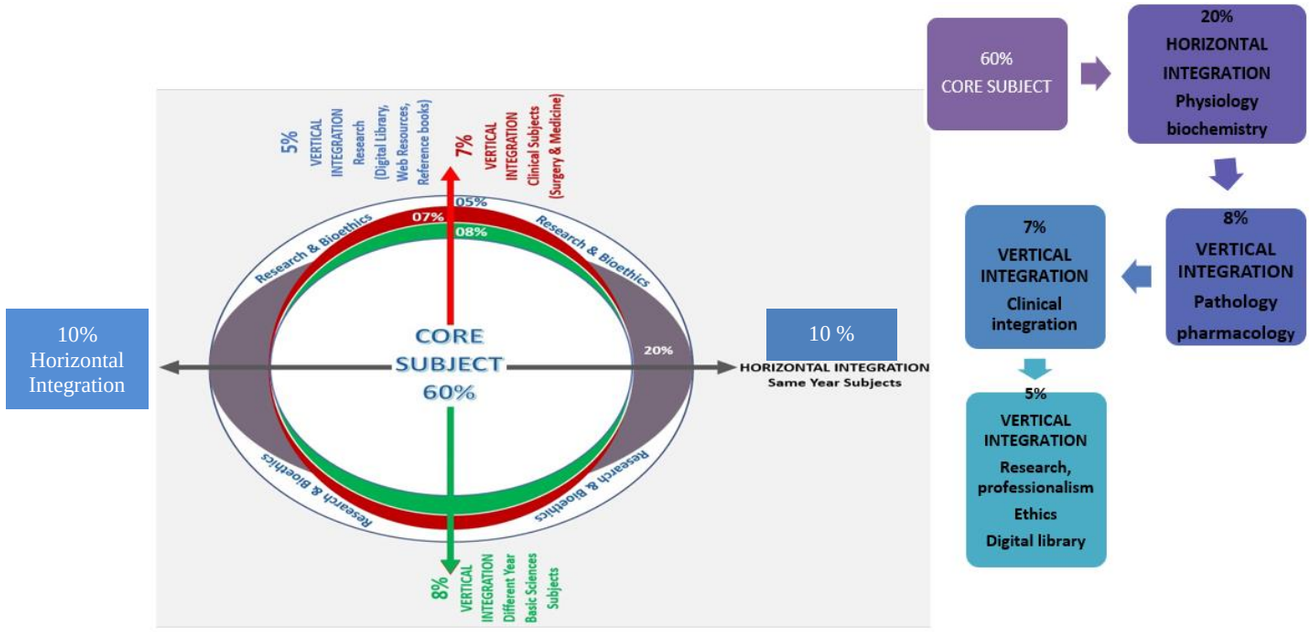


Figure 1. Prof Umar's Model of Integrated Lecture

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	Session - II
Step 6	Collect Information from outside	
Step 5	Generate learning Issues	Session - I
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		
	• To understand the Biophysiological aspects	C3		
	• Able to focus on provision of curative and preventive health care measures	C3		
	• Practice the principles of Bioethics	C3		
	• Apply strategic use of AI in health care	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		
	• To understand the Biophysiological aspects	C3		
	• Able to focus on provision of curative and preventive health care measures	C3		
	• Practice the principles of Bioethics	C3		
	• Apply strategic use of AI in health care	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		
	• To understand the Biophysiological aspects	C3		
	• Able to focus on provision of curative and preventive health care measures	C3		
	• Practice the principles of Bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• How to read relevant research article	C3		
Histology of CVS (Capillaries)	• Differentiate between continuous, fenestrated and sinusoidal capillaries	C2	LGIS	MCQ SAQ VIVA
	• Enlist bio functions of endothelium	C2		
	• Discuss related clinicals	C2		
	• To understand the Biophysiological aspects	C3		
	• Able to focus on provision of curative and preventive health care measures	C3		
	• Practice the principles of Bioethics	C3		
	• Apply strategic use of AI in health care	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		
	• Discuss biophysiological aspects of Heart & Lymphatic System	C2		
	• To understand the Biophysiological aspects	C3		
	• Able to focus on provision of curative and preventive health care measures	C3		
	• Practice the principles of Bioethics	C3		
	• Apply strategic use of AI in health care	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		

	• To understand the Biophysiological aspects	C3		
	• Able to focus on provision of curative and preventive health care measures	C3		
	• Practice the principles of Bioethics	C3		
	• Apply strategic use of AI in health care	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		
	• To understand the Biophysiological aspects	C3		
	• Able to focus on provision of curative and preventive health care measures	C3		
	• Practice the principles of Bioethics	C3		
	• Apply strategic use of AI in health care	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		
	• To understand the Biophysiological aspects	C3		
	• Able to focus on provision of curative and preventive health care measures	C3		
	• Practice the principles of Bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• How to read relevant research article	C3		
	• Discuss formation of septum in atrioventricular canal	C2		MCQ
	• Describe formation of atrioventricular valves	C2		
	• Explain septum formation in truncusarteriosis&conuscordis	C2		

Development of CVS (Formation and partitioning of Ventricles)	• Describe septum formation in ventricles Discuss formation of semilunar valves	C2	LGIS	SAQ VIVA
	• Discuss development of conducting system of heart	C2		
	• Discuss related Congenital abnormalities	C3		
	• To understand the Biophysiological aspects	C3		
	• Able to focus on provision of curative and preventive health care measures	C3		
	• Practice the principles of Bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• How to read relevant research article	C3		
Development of CVS (Fetal circulation)	• Describe fetal circulation in detail	C2		
	• Discuss role of foramen ovale, ductus arteriosis and ductus venosis in fetal circulation and their fate	C2	LGIS	MCQ SAQ VIVA
	• Differentiate between fetal and postnatal circulation	C2		
	• Discuss related Congenital abnormalities	C3		
	• To understand the Biophysiological aspects	C3		
	• Able to focus on provision of curative and preventive health care measures	C3		
	• Practice the principles of Bioethics	C3		
	• Apply strategic use of AI in health care	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 • Describe Biomedical significance of lipids	C2 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 • Discuss structure and functions of compound lipids • Interpret the clinical role of compound lipids	C2 C2 C3	LGIS	MCQs SAQs Viva
Derived lipids	• Describe derived lipids	C2	LGIS	MCQs SAQs Viva
Cholesterol	• Describe Structure and physical properties of Cholesterol • Discuss Chemical properties and functions • Interpret clinical findings of hypercholesterolemia	C2 C2 C3	LGIS	MCQs SAQs Viva
Prostaglandins	• Classify Prostaglandins • Describe functions and clinical significance of Prostaglandins. • Interpret the role of drugs in prostaglandin synthesis	C2 C2 C3	LGIS	MCQs SAQs Viva
Carbohydrate Chemistry				
Introduction and classification of carbohydrates	• Classify carbohydrates • Explain different types of carbohydrates and their clinical significance	C2 C2	LGIS	MCQs SAQs Viva
Isomerism, optical activity and mutarotation	• Discuss Different properties of carbohydrates (Isomerism, optical activity and mutarotation)	C2	LGIS	MCQs SAQs Viva
Monosaccharide	• Classify monosaccharide • Describe chemical properties of monosaccharide • Interpret the clinical role of sorbitol, mannitol and cardiac glycosides	C2 C2 C3	LGIS	MCQs SAQs Viva

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		
	• Correlate the clinical conditions	C3		
	• To understand the Biophysiological aspects of Thoracic wall	C3		
	• Able to focus on provision of curative and preventive health care measures	C3		
	• Practice the principles of Bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• 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		
	• Correlate the clinical conditions	C3		
	• To understand the Biophysiological aspects of Mediastinum	C3		
	• Able to focus on provision of curative and preventive health care measures	C3		
	• Map Arch of Aorta, Bracheocephalic artery on SP/Model	P		
	• Practice the principles of Bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• 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		
	• Correlate the clinical conditions	C3		
	• To understand the Biophysiological aspects of Pericardium	C3		

	• Able to focus on provision of curative and preventive health care measures	C3		
	• Map Pericardium on SP/Model	C3		
	• Practice the principles of Bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• 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		
	• Correlate the clinical conditions	C3		
	• To understand the Biophysiological aspects of Heart(External Feature)	C3		
	Able to focus on provision of curative and preventive health care measures	C3		
	• Practice the principles of Bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• Read relevant research article	C3		
	• Use HEC digital library	C3		
Heart (Internal features)	• Differentiate between muscular and smooth part.	C2	SGD, Skills lab	MCQ SAQ VIVA OSPE
	• Identify the various openings, important features in inter-atrial septum.	C2		
	• Identify S.A node	C1		
	• Discuss internal features of left atrium, inter atrial septum, mitral valve and pulmonary veins.	C2		
	• Discuss importance of modulator band.	C2		
	• Identify mitral valve, intervetntricular septum, aortic vestibule, arotic valve.	C3		
	• Correlate the clinical conditions	C3		
	• To understand the Biophysiological aspects of Heart (Internal features)	C3		
	• Able to focus on provision of curative and preventive health care measures	C3		
	• Map Cardiac valves on SP/Model	P		
	• Practice the principles of Bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• Read relevant research article	C3		
	• Use HEC digital library	C3		
Heart	• Coronary Atherosclerosis	C1	SGD,	MCQ
	• Myocardial Infarction	C1		

(Clinical Correlations)	• Angina Pectoris	C1	Skills lab	SAQ VIVA OSPE
	• Coronary Angioplasty	C1		
	• Correlate the clinical conditions	C2		
	• To understand the Biophysiological aspects of Heart (Clinical Correlations)	C3		
	Able to focus on provision of curative and preventive health care measures	C3		
	• Practice the principles of Bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• 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,	C1		
	• Discuss the concept of right and left dominance.	C2		
	• Describe the venous drainage of heart.	C2		
	• Correlate the clinical conditions	C3		
	• To understand the Biophysiological aspects of Vasculature of heart	C3		
	• Able to focus on provision of curative and preventive health care measures	C3		
	• Practice the principles of Bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• 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
	•	C3		
	• Correlate the clinical conditions	C3		
	• To understand the Biophysiological aspects of Innervation of Heart	C3		
	• Able to focus on provision of curative and preventive health care measures	C3		
	• Practice the principles of Bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• Read relevant research article	C3		
Superior mediastinum (Trachea,	• Enumerate the structure of superior mediastinum	C1	SGD Skills lab	MCQ SAQ
	• Describe great vessels in superior mediastinum	C2		
	• Correlate the clinical conditions	C3		

Esophagus, Ascending Aorta)	• To understand the Biophysiological aspects of Superior Mediastinum	C3		VIVA OSPE
	• Able to focus on provision of curative and preventive health care measures	C3		
	• Map Ascending Aorta on SP/Model	P		
	• Practice the principles of Bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• Read relevant research article	C3		
Posterior mediastinum (Boundaries and Structures)	• Identify structures in posterior mediastinum	C1	SGD, Skills lab	MCQ SAQ VIVA OSPE
	• Describe anatomy of structure in Posterior mediastinum	C2		
	• Identify course, relations and branches of descending aorta.	C2		
	• Correlate the clinical conditions	C2		
	• To understand the Biophysiological aspects of Posteror mediastinum	C3		
	• Able to focus on provision of curative and preventive health care measures	C3		
	• Map Descending Thoracic Aorta on SP/Model	P		
	• Practice the principles of Bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• 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		
	• Correlate the clinical conditions	C3		
	• To understand the Biophysiological aspects of Posterior mediastinum	C3		
	• Able to focus on provision of curative and preventive health care measures	C3		
	• Practice the principles of Bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• Read relevant research article	C3		
	• Identify the surfaces present at different levels of cross sections	P		MCQ

Cross sectional Anatomy/ Radiology	•		SGD, Skills lab	SAQ VIVA OSPE
	• Manubriosternal Joint/Angle of Louis	P		
	• Upper body of Sternum	P		
	• Section between T 7 , T 8 Thoracic vertebrae	P		
	• Section between T 8 , T 9 Thoracic vertebrae	P		
	• Section between T 9 , T 10 Thoracic vertebrae	P		
	• How to access HEC digital library	C3		
	• Correlate the clinical conditions	C2		
	• Able to focus on provision of curative and preventive health care measures	C3		
	• Practice the principles of Bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• Read relevant research article	C3		

Physiology Small Group Discussion (SGDs)

Topics	Learning Objectives	References	Learning Resources	Learning Domains	Learning Strategy	Assessment Tools
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)	3. https://youtu.be/YNROPnYy1tc 4. https://www.osmosis.org/learn/Microcirculation_and_Starling_forces	C2 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) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.(Chapter 18,Page 217)	4. https://youtu.be/HUf1LtkPj1k 5. https://www.sciencedirect.com/topics/nursing-and-health-professions/blood-pressure-regulation 6. https://www.cliffsnotes.com/study-guides/anatomy-and-physiology/the-cardiovascular-system/control-of-blood-pressure	C2 C2	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)	4. https://youtu.be/5S9xEpAdAgA 5. https://jps.biomedcentral.com/articles/10.1007/s12576-012-0192-0 6. 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

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	• 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
	• 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	
Mediastinum	• Discuss the boundaries and division of mediastinum	• ClinicallyOriented Anatomy 6th Edition,
	• Enumerate the contents of anterior mediastinum.	
	• How to access HEC digital library	

	• How to read relevant research article	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 • 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 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.	• ClinicallyOriented Anatomy 6th Edition, P no.129,135-137,144-149,153-159,171-172 https://youtu.be/uhSBFOTwzDQ

	• How to access HEC digital library • How to read relevant research article	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/
	• Describe formation, course and clinical importance of azygos system of veins • Describe formation and importance of hemiazygos vein	• ClinicallyOriented Anatomy 6th Edition, P no. 128, 168-172, 179

Posterior mediastinum II	• How to access HEC digital library • How to read relevant research article	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 • Describe the following. Bipolar limb leads.	• 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 C1 C1	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment)

	• 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		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 Edition.(Chapter 09,Page 179,180-189)	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 SDL Evaluation

		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			
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 muscle at rest and during exercise.	Ganong's Review of Medical Physiology.25TH Edition.Section 05(Chapter 30, Page 549)	1. https://www.sciencedirect.com/topics/medicine-and-dentistry/muscle-blood-flow	C2	SDL	MCQ SEQ VIVA VOCE

Cardiovascular changes 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)	2. https://youtu.be/H6Fd8sfE2eQ			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 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		
	• 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		
	• 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		
	• 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		
	• 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		
	• 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	C1	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	C1	Skill Lab	OSPE Viva
	• Procedure	P		
	• Various characteristic of pulse	P, C2		
ECG	• Detail study of ECG leads	C2	Skill Lab	OSPE Viva
	• How to apply leads	P		
	• Recording	P		
	• Discussion about normal ECG	P, C2		
	• Clinical importance	C2		
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		
CPR	• Steps of CPR	P	Skill Lab	OSPE Viva
	• Importance of CPR in daily life	C2, P		
Triple Response	• Steps of Examination	P	Skill Lab	OSPE Viva
	• Clinical Importance	C2		

Biochemistry Practicals Skill Laboratory (SKL)

Topic	Learning Objectives At The End Of Practical Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Carbohydrates	• Perform Tests for the detection of carbohydrates and reducing sugars (Molisch's test)	P	Skill lab	OSPE
Carbohydrates	• Perform Tests for the detection of carbohydrates and reducing sugars (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**
- **PBLs**
- **Vertical Integration LGIS**

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)

Community Medicine

Topic	Learning Objectives At the end of lecture students should be able to	Learning Domain	Teaching Strategy	Assessment Tool
Risk factors of coronary vascular disease	• Students should be able to identify and explain the major risk factors for coronary vascular disease, including lifestyle and genetic factors, and how they contribute to the development of the condition.	C1, C2	LGIS	MCQ
	• Students should be able to describe the common symptoms of coronary vascular disease and outline effective prevention strategies, including lifestyle modifications and medical interventions.	C2, C3		

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

Pharmacology

Topic	Learning Objectives At the end of lecture students should be able to	Learning Domain	Teaching Strategy	Assessment Tool
Clinical Pharmacology of Anti hypertensive drugs	• Students should be able to explain the mechanisms of action of different classes of antihypertensive drugs, such as ACE inhibitors, beta-blockers, and calcium channel blockers, and how they lower blood pressure.	C2	LGIS	MCQ
	• Students should be able to assess the therapeutic uses of various antihypertensive drugs and identify common side effects and contraindications associated with each class of medication.	C2		

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		

Medicine

Topic	At the End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
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

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	• Define gestational hypertension	C1		
	• Describe the spectrum of hypertensive disordersduring pregnancy with proper definitions	C2		
	• Comprehend pathophysiology of these disorders	C2		

pregnancy (gestational hypertension, pre-eclampsia)	• Know clinical presentation of hypertensive disorders	C2	LGIS	MCQs
	• Justify relevant laboratory investigations	C2		
	• Understand principles of management	C2		
	• Enlist maternal and fetal complications	C2		

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		

Radiology

Topic	At the End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Chest radiograph with perspective of cardiovascular system	• Interpret normal x-rays of Chest	C2	LGIS	MCQs
	• Discuss radiological features of different structures in chest	C2		

List of CVS Module Vertical Courses Lectures

SECTION – IV

Spiral Courses

Content

- **Longitudinal Themes**
    - **The Holy Quran Translation**
    - **Behavioral Sciences & Biomedial Ethics**
    - **Family Medicine**
    - **Early Clinical Exposure (ECE)**

Introduction to Spiral Courses

The Holy Quran Translation

A course of Islamic Studies provides students with a comprehensive overview of the fundamental aspects of Islam, its history, beliefs, practices, and influence on society and familiarize students with a solid foundation in understanding the religion of Islam from an academic and cultural perspective. Ethics, in integrated form will shape the core of the course to foster among students the universal ethical values promoted by Islam.

Bioethics

Biomedical ethics, also known as bioethics, is a field of study that addresses the ethical, social, and legal issues arising from medicine and the life sciences. It applies moral principles and decision-making frameworks to the practice of clinical medicine, biomedical research, and health policy. Biomedical ethics seeks to navigate the complex ethical dilemmas posed by advances in medical technology, research methodologies, and healthcare practices. Key areas of focus include patient rights and autonomy, confidentiality, informed consent, end-of-life care, resource allocation, and the ethics of genetic engineering, among others.

Biomedical ethics within medical universities plays a pivotal role in shaping the moral framework through which future healthcare professionals navigate the complex and often challenging decisions they will face in their careers. This critical discipline integrates ethical theories and principles with clinical practice, research, and healthcare policy, fostering a deep understanding of the ethical dimensions of medicine. By embedding biomedical ethics into the curriculum, Rawalpindi medical university equips students with the tools to critically analyze and address ethical dilemmas, ranging from patient confidentiality and informed consent to end-of-life care and the equitable distribution of healthcare resources.

This education goes beyond theoretical knowledge, encouraging students to apply ethical reasoning in practical scenarios, thus preparing them for the moral complexities of the medical field. Biomedical ethics also promotes a culture of empathy, respect, and integrity, ensuring that future medical practitioners not only excel in their technical skills but also uphold the highest ethical standards in patient care and research. Through seminars, case studies, and interdisciplinary collaborations, students are encouraged to engage in ethical discourse, reflecting on the societal impact of medical advancements and the responsibility of medical professionals to society. This foundational aspect of medical education cultivates a generation of healthcare professionals committed to ethical excellence, patient advocacy, and the pursuit of equitable healthcare for all.

Professionalism

Professionalism in medicine refers to the set of values, behaviors, and relationships that underpin the trust the public has in doctors and other healthcare professionals. It encompasses a commitment to competence, integrity, ethical conduct, accountability, and putting the interests of patients above one's own. Professionalism involves adhering to high standards of practice, including maintaining patient confidentiality, communicating effectively and respectfully with patients and colleagues, and continually engaging in self-improvement and professional development. It also includes a responsibility to improve access to high-quality healthcare and to contribute to the welfare of the community and the betterment of public health. In essence, professionalism in medicine is foundational to the quality of care provided to patients and is critical for maintaining the trust that is essential for the doctor-patient relationship.

Rawalpindi Medical University emphasizes the importance of professionalism in medicine, integrating it throughout its curriculum to ensure that students embody the core values of respect, accountability, and compassion in their interactions with patients, colleagues, and the community. This focus on professionalism is designed to prepare students for the complexities of the healthcare environment, instilling in them a deep sense of responsibility to their patients, adherence to ethical principles, and a commitment to continuous learning and improvement. Through a combination of theoretical learning, practical training, and mentorship, RMU encourages its students to exemplify professionalism in every aspect of their medical practice. Workshops, seminars, and clinical rotations further reinforce these values, providing students with real-world experiences that highlight the importance of maintaining professional conduct in challenging situations. RMU's approach to professionalism not only shapes competent and ethical medical professionals but also contributes to the broader mission of improving healthcare standards and patient outcomes. By prioritizing professionalism, Rawalpindi Medical University plays a crucial role in advancing the medical profession and ensuring that its graduates are well-equipped to meet the demands of a rapidly evolving healthcare landscape with honor and integrity.

Communication Skills

Communication skill for health professionals involves the ability to effectively convey and receive information, thoughts, and feelings with patients, their families, and other healthcare professionals. It encompasses a range of competencies including active listening, clear and compassionate verbal and non-verbal expression, empathy, the ability to explain medical conditions and treatments in an understandable way, and the skill to negotiate and resolve conflicts. Effective communication is essential for establishing trust, ensuring patient understanding and compliance with treatment plans, making informed decisions, and providing holistic care. It directly impacts patient satisfaction, health outcomes, and the overall efficiency of healthcare delivery.

At Rawalpindi Medical University (RMU), the development of communication skills is regarded as a fundamental aspect of medical education, recognizing its critical importance in enhancing patient care, teamwork, and interdisciplinary collaboration. RMU is dedicated to equipping its students with exceptional communication abilities, enabling them to effectively interact with patients, their families, and healthcare colleagues. The curriculum is thoughtfully designed to incorporate various interactive and experiential learning opportunities, such as role-playing, patient interviews, and group discussions, which allow students to practice and refine their communication skills in a supportive environment.

By integrating communication skills training throughout its programs, RMU not only enhances the interpersonal competencies of its future healthcare professionals but also contributes to improving the overall quality of healthcare delivery. Graduates from RMU are distinguished not just by their clinical expertise but also by their ability to connect with patients and colleagues, making them highly effective and compassionate practitioners.

Behavioral Sceinces

Behavioral sciences in medicine focus on understanding and addressing the psychological and social aspects of health and illness. This interdisciplinary field combines insights from psychology, sociology, anthropology, and other disciplines to enhance medical care and patient outcomes. It explores how behavior, emotions, and social factors influence health, disease, and medical treatment. By incorporating behavioral science principles into medical practice, healthcare professionals can better understand patients' perspectives, improve communication, and promote positive health behaviors, ultimately contributing to more comprehensive and effective patient care.

Family Medicine

Family medicine is a medical specialty dedicated to providing comprehensive health care for people of all ages and genders. It is characterized by a long-term, patient-centered approach, building sustained relationships with patients and offering continuous care across all stages of life. It focuses on treating the whole person within the context of the family and the community, emphasizing preventive care, disease management, and health promotion.

The Family Medicine Curriculum at Rawalpindi Medical University (RMU) marks a significant stride towards holistic healthcare education, aiming to prepare medical graduates for the comprehensive and evolving needs of family practice. This curriculum is designed to offer a broad perspective on healthcare, focusing on preventive care, chronic disease management, community health, and the treatment of acute conditions across all ages, genders, and diseases. Emphasizing a patient-centered approach, the curriculum ensures that students develop a deep understanding of the importance of continuity of care, patient advocacy, and the ability to work within diverse community settings.

RMU's Family Medicine Curriculum integrates theoretical knowledge with practical experience. Students are exposed to a variety of learning environments, including community health centers, outpatient clinics, and inpatient settings, providing them with a well-rounded understanding of the different facets of family medicine. This hands-on approach is complemented by interactive sessions, workshops, and seminars that cover a wide range of topics from behavioral health to geriatric care, ensuring students are well-equipped to address the comprehensive health needs of individuals and families.

Artificial Intelligence

To realize the dreams and impact of AI requires autonomous systems that learn to make good decisions. Reinforcement learning is one powerful paradigm for doing so, and it is relevant to an enormous range of tasks, including robotics, game playing, consumer modeling and healthcare. This class will provide a solid introduction to the field of reinforcement learning and students will learn about the core challenges and approaches, including generalization and exploration. Through a combination of lectures, and written and coding assignments, students will become well versed in key ideas and techniques for RL. Assignments will include the basics of reinforcement learning as well as deep reinforcement learning — an extremely promising new area that combines deep learning techniques with reinforcement learning. In addition, students will advance their understanding and the field of RL through a final project.

Integrated Undergraduate Research Curriculum

The integrated undergraduate research curriculum (IUGRC) of RMU occupies a definite space in schedule of each of the five years in rational and incremental way. It has horizontal harmonization as well as multidisciplinary research work potentials. In the first-year teachings are more introductory & inspirational rather than instructional. The teachings explain what & why of research and what capacities are minimally required to comprehend research & undertake research. Some research dignitaries' lecture are specifically arranged for sharing their experiences and inspiring the students. Students are specifically assessed through their individual compulsory written feedback (reflection) after the scheduled teachings end.

Entrepreneurship

Entrepreneurship is the process of designing, launching, and running a new business, which typically starts as a small enterprise offering a product, process, or service for sale or hire. It involves identifying a market opportunity, gathering resources, developing a business plan, and managing the business's operations, growth, and development.

Entrepreneurship in medical universities represents a burgeoning field where the innovative spirit intersects with healthcare to forge advancements that can transform patient care, medical education, and healthcare delivery. This unique amalgamation of medical expertise and entrepreneurial acumen empowers students, faculty, and alumni to develop groundbreaking medical technologies, healthcare solutions, and startups that address critical challenges in the health sector. By integrating entrepreneurship into the curriculum, Rawalpindi Medical university is not only expanding the traditional scope of medical education but also fostering a culture of innovation and problem-solving. This enables future healthcare professionals to not only excel in clinical skills but also in business strategies, leadership, and innovation management.

Such initiatives often lead to the creation of medical devices, digital health platforms, and therapeutic solutions that can significantly improve patient outcomes and make healthcare more accessible and efficient. Through incubators, accelerators, and partnerships with the industry, medical universities are becoming hotbeds for healthcare innovation, driving economic growth, and contributing to the broader ecosystem of medical research and entrepreneurial success.

Digital Literacy Module

Digital literacy means having the skills one needs to live, learn, and work in a society where communication and access to information is increasingly through digital technologies like internet platforms, social media, and mobile devices.

Early Clinical Exposure (ECE)

Early clinical exposure helps students understand the relevance of their preclinical studies by providing real-world contexts. This can enhance motivation and engagement by showing students the practical application of their theoretical knowledge. Early exposure allows students to begin developing essential clinical skills from the start of their education. This includes not only technical skills but also crucial soft skills such as communication, empathy, and professionalism. Direct interaction with patients early in their education helps students appreciate the complexities of patient care, including the psychological and social aspects of illness. Early exposure to various specialties can aid students in making informed decisions about their future career paths within medicine.

Early clinical experiences contribute to the development of a professional identity, helping students see themselves as future physicians and understand the responsibilities and ethics associated with the profession. This can help reduce the anxiety associated with clinical work by familiarizing students with the clinical environment. It can build confidence in their abilities to interact with patients and healthcare professionals. Engaging with real-life clinical situations early on encourages the development of critical thinking and problem-solving skills, which are essential for medical practice. It helps bridge the gap between theoretical knowledge and practical application, leading to a more integrated and holistic approach to medical education. It allows students to observe and understand how healthcare systems operate, including the challenges and limitations faced in different settings.: Early patient interaction emphasizes the importance of patient-centered care from the outset, underscoring the importance of treating patients as individuals with unique needs and backgrounds.

Practical experiences can enhance long-term retention of knowledge as students are able to connect theoretical learning with clinical experiences.: Early clinical experiences often involve working in multidisciplinary teams, which fosters a sense of collaboration and understanding of different roles within healthcare.

In summary, early clinical exposure in medical education is pivotal for the holistic development of medical students, providing them with a strong foundation of practical skills, professional attitudes, and a deep understanding of patient-centered care.

Behavioral Sciences & Biomedial Ethics

Topic	At the End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Sociology & Health	• The student should be able to understand sociology & health, social groups, social classes & child rearing practice	C1, C2	LGIS	MCQS
Anthropology & Health	• The student should be able to understand culture & its influence on health care	C1, C2	LGIS	MCQS

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		

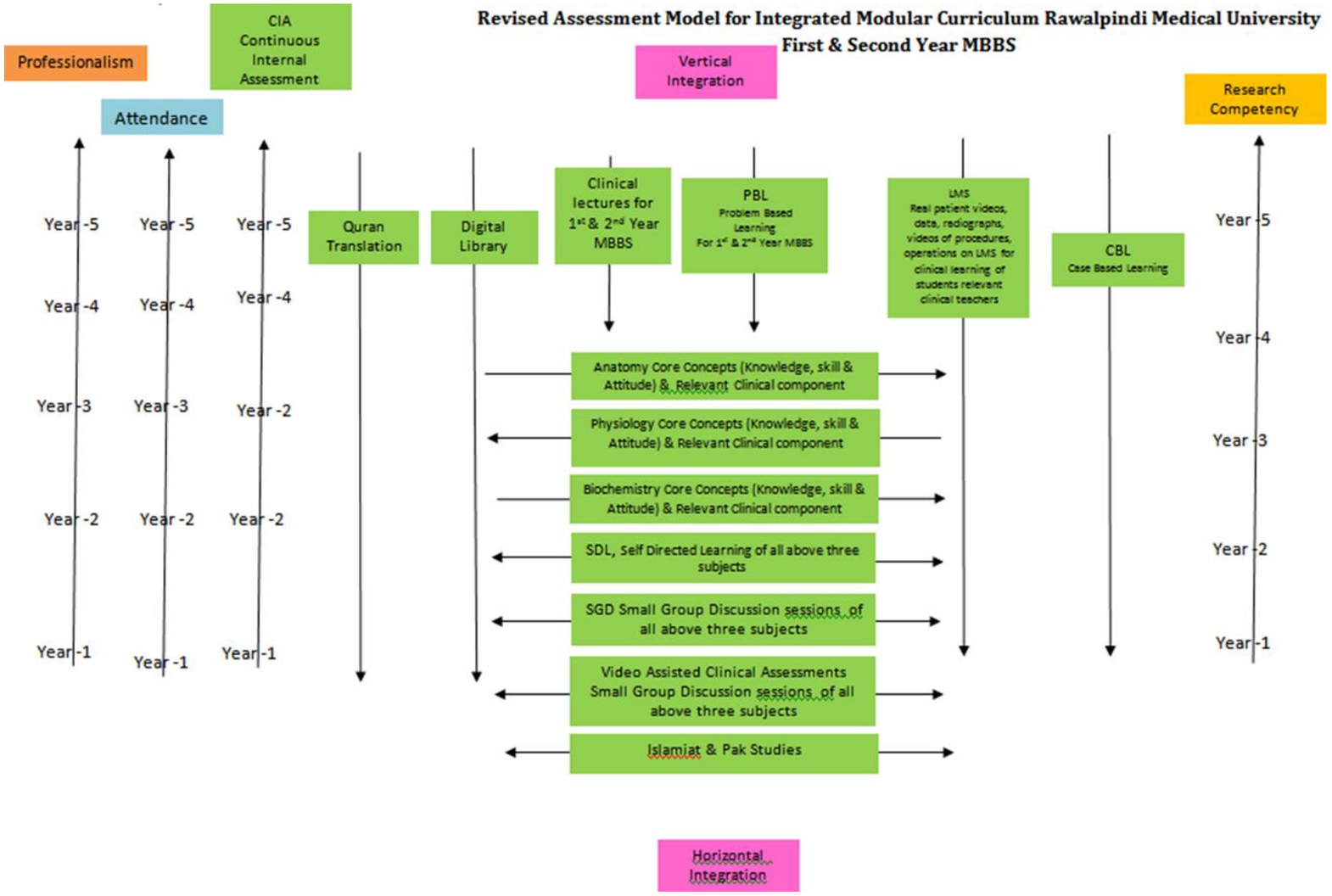
List of CVS Module Spiral Courses Lectures

SECTION - V

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%

60% 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 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-III	1	Weekly LMS Based Assessments (Anatomy, Physiology & Biochemistry)	Formative	2 Hours	3 Hours 45 Minutes	3 Hours	2 Formative	6 Summative
	2	End Module Examinations (SEQ, SAQ, EMQ & MCQs Based)	Summative	2 Hours				
	3	Audio Vissual (AV) OSPE (10 slides) 5 minutes per slide	Summative	50 Minutes				
	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 & Spiral Curriculums	Formative	60 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 - VI

Time Table

Integrated Clinically Oriented Modular Curriculum for First Year MBBS

CVS Module Time Table

First Year MBBS

Session 2023-2024

Batch- 51

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.	Chairperson Anatomy & Dean Basic Sciences	Prof. Dr. Ayesha Yousaf
3.	Director DME	Prof. Dr. Ifra Saeed
4.	Chairperson Physiology	Prof. Dr. Samia Sarwar
5.	Chairperson Biochemistry	Dr. Aneela Jamil
6.	Focal Person Anatomy First Year MBBS	Asso. Prof. Dr. Mohtashim Hina
7.	Focal Person Physiology	Dr. Sidra Hamid
8.	Focal Person Biochemistry	Dr. Aneela Jamil
9.	Focal Person Pharmacology	Dr. Zunera Hakim
10.	Focal Person Pathology	Dr. Asiya Niazi
11.	Focal Person Behavioral Sciences	Dr. Saadia Yasir
12.	Focal Person Community Medicine	Dr. Afifa Kulsoom
13.	Focal Person Quran Translation Lectures	Dr. Fahad Anwar
14.	Focal Person Family Medicine	Dr. Sadia Khan

Module Task Force Team		
1.	Coordinator	Dr. Aneela (Senior Demostrator of Physiology)
2.	DME Focal Person	Dr. Farzana Fatima
3.	Co-coordinator	Dr. Kashif (APMO of Anatomy)
4.	Co-Coordinator	Dr. Romessa Naeem (Demonstrator Biochemistry)
5.	Co-coordinator	Dr. Sheena Tariq (Senior Demonstrator Physiology)

DME Implementation Team		
1.	Director DME	Prof. Dr. Ifra Saeed
2.	Assistant Director DME	Dr. Farzana Fatima
3.	Implementation Incharge 1st & 2nd Year MBBS	Prof. Dr. Ifra Saeed Dr. Farzana Fatima
4.	Editor	Muhammad Arslan Aslam

Discipline Wise Details of Modular Content

Block	Department	General Anatomy	Embryology	Histology	Gross Anatomy
III	• 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			
	Spiral Courses				
	• The Holy Quran Translation	• Mumamalat-I • Muashrat-II • Ekhlaqiaat-I • Mumamalat -II			
	• Behavioural Sciences, Bioethics & Professionlism	• Breaking the bad news • Stress and its management			
	• 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			
	Vertical Integration				
	• Community Medicine	• Risk factors of coronary vascular disease			
	• Pathology	• Edema			
	• Eye	• Hypertensive retinopathy			
	• Pharmacology	• Clinical Pharmacology of Anti hypertensive drugs			
	• Medicine	• ECG Changes (MI, Electrical Imbalance, Myocardial hypertrophy) • Overview of acute coronary syndrome & management of heart failure & management of shock			

		• Hypertension
	• Gynae & Obs	• Cardiovascular changes in pregnancy • Hypertensive disorders in pregnancy (gestational hypertension, pre-eclampsia)
	Early Clinical Exposure (ECE)	
	• Cardiology	• See cases of Heart Failure and Dyspnea Raised JVP/Oedema • Clinical Examination of Precordium • Normal Heart Sounds • Additional heart sounds See Cases of Coronary Heart Disease
	• Radiology	• X-Ray chest • Cardiomegaly • Radiological signs of heart failure
	• Pediatrics	• See cases of congenital heart diseases • Pediatric case of Heart Failure

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*11+1 =23 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*11+1 =23 hours
3.	Practical / Skill Lab	1.5 * 4 = 6 hours
4.	Self-Directed Learning (SDL)	1.5 * 8= 12 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	1. 2.	• 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

	CVS (**By Dr Fahad)** • Classification of blood vessels & Biophysical considerations (**By 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,					Introduction to CVS 2. Classification of blood vessels & Biophysical considerations 3. Regulation of 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

	cutaneous circulation **(By Dr Fareed)** • Skeletal muscle blood flow, Cardiovascular 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 Senior Demonstrator with Postgraduate Qualification.

Category B:** By Senior Demonstrators & APWMO

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	05

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 = 22.5hours	4.5
3.	Problem Based Learning (PBL)	Zero	zero
4.	Practical / Skill Lab	1.5 * 5= 22.5hours	4.5
5.	Self-Directed Learning (SDL)	----------	08

First Year Timetable for CVS Module (First Week)
12-09-2024 to 18-09-2024

Date/Day	8:00 AM – 09:00 AM	09:00 AM – 10:00 AM	10:00am – 10:20am	10:20am-11:20am	11:20am-12:10pm	12:10pm-12:30pm	12:30pm – 2:00pm	Home Assignment
Thursday 12-09-2024	**DISSECTION/SGD**		Break	**COMMUNITY MEDICINE (LGIS)**	**PHYSIOLOGY (LGIS)**	Break	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 Abdul Qadoos (Odd)	Dr Fahad (Even) / Dr. Aneela (Odd)			
Date/Day	**8:00 AM – 09:00 AM**	**09:00 AM – 10:00 AM**		**10:00 AM – 11:00 AM**	**11:00 AM – 12:00 PSM**			
Friday 13-09-2024	**QURAN TRANSLATION-I**	**QURAN TRANSLATION-II**		**ANATOMY (LGIS)**	**PHYSIOLOGY (LGIS)**		SDL Physiology Classification of Blood vessels & Biophysical considerations	
	Muashrat-II / Mumamalat-I	Mumamalat-I / Muashrat-II		**Embryology**: Development of Venous System	**General Anatomy**: (General Organization of CVS)	Classification of Blood vessels & Biophysical considerations / Introduction to CVS		
	Molana Abdul Wahid (Even) / Mufti Naeem (Odd)	Mufti Naeem (Even) / Molana Abdul Wahid (Odd)		Prof. Dr. Ayesha / Assoc Prof. Dr. Arsalan (Even)	Prof. Dr. Saima (Odd)	Dr. Aneela (Even) / Dr Fahad (Odd)		
Saturday 14-09-2024	**BIOCHEMISTRY (LGIS)**	**MEDICINE**	Break	**ANATOMY (LGIS)**	**PHYSIOLOGY (LGIS)**	Break	Practical &CBL Topics mentioned at the end.	SDL Biochemistry Classification & functions of carbohydrates
	Introduction and classification of carbohydrates & Isomerism / Introduction and classification of lipids &Fatty acids	Overview of acute coronary syndrome & Management of heart failure & Management of shock		**General Anatomy**: (General Organization of CVS) / **Embryology**: Development of Venous System	Heart sounds / Regulation of blood flow			
	Dr. Kashif (Even) / Dr. Uzma Zafar/Dr. Aneela (odd)	Dr. Asad cardiologist		Prof. Dr. Saima (Even) / Prof. Dr. Ayesha / Assoc Prof. Dr. Arsalan (Odd)	Dr. Uzma (Even) / Dr. Faizania (Odd)			
Monday 16-09-2024	**DISSECTION/SGD**	**BEHAVIOURAL SCIENCES**		**PBL 1 (SESSION I)**	**PHYSIOLOGY (LGIS)**		Practical &CBL Topics mentioned at the end.	SDL Biochemistry Classification & functions of lipids
	Mediastinum (General Features & Divisions)	Sociology & Health		PBL Team	Regulation of blood flow / Heart sounds			
		Dr. Mehmood Ali Khan (Even) / Dr. Mehboob Ali Shah (Odd)			Dr. Faizania (even) / Dr. Uzma (Odd)			
Tuesday 17-09-2024	Eid Milad-un-Nabi (12^{th} Rabi-ul- Awwal 1446 A.H)							
Wednesday 18-09-2024	**DISSECTION/SGD**	**BIOCHEMISTRY (LGIS)**		**ANATOMY (LGIS)**	**PHYSIOLOGY (LGIS)**		Practical &CBL Topics mentioned at the end.	SDl Anatomy Thoracic Vertebrae
	Dissection/Spotting	Introduction and classification of lipids &Fatty acids / Introduction and classification of carbohydrates & Isomerism		**General Anatomy**: (Classification of vessels) / **Embryology**: (Aortic Arches and derivatives)	Capillary circulation, Concept of vasomotion and starling forces / Functions of veins, Venous return and factors affecting venous return			
		Dr. Uzma Zafar/Dr.Aneela (Even) / Dr. Kahif (Odd)		Prof. Dr. Saima (Even) / Prof. Dr. Ayesha / Assoc Prof. Dr. Arsalan (Odd)	Dr. Fahad (Even) / Dr. Kamil (Odd)			

Table No. 1 (Time: 12:20pm – 02:00pm)

Batch Distribution for Practical Skills (all subjects) CBL / Small Group Disscusion (Biochemistry and Physiology)		
Sr. No	Batch	Roll No.
1.	A	01-70
2.	B	71-140
3.	C	141-210
4.	D	211-280
5.	E	281-onwards

Topics for Skill Lab with Venue

- Elastic Arteries (Anatomy/ Histology-practical) venue Histology Laboratory (Dr. Kashif)
- (Molisch's test) (Biochemistry practical) venue- Biochemistry Laboratory
- Examination of arterial pulse (Physiology –practical) Physiology Laboratory
- Determination of Jugular Venous Pressure (JVP) (Physiology –practical) Physiology Laboratory

Topics for SGDs / CBL with Venue

- Biochemistry tutorial – classification of carbohyrates and lipids
- Concept of vasomotion and starling forces. (SGD) (Physiology Lecture Hall No.05)
- Anatomy CBL: Cardiac Tamponade

Schedule for Practical / Small Group Discussion

Day	Histology Practical		Biochemistry Practical			Physiology Practical		Physiology SGD			Biochemistry SGD	
	Batch	Teacher Name	Batch	Teacher Name		Batch	Teacher Name	Batch	Teacher Name		Batch	Teacher Name
Monday	C	Supervised by HOD	B	Dr. Rahat	Supervised by HOD	E	Dr. Farid/ Dr. Ali Zain/Dr. Usman	A	Dr. Sheena/Dr. Nazia	Supervised by HOD	D	Dr. Uzma
Tuesday	D		C	Dr. Romessa		A	Dr. Sheena/ Dr..Nazia/Dr. Afsheen	B	Dr. Uzma/Dr. Farah		E	Dr. Almas
Wednesday	E		D	Dr. Uzma		B	Dr. Uzma/ Dr. Farah/Dr/ Ramsha	C	Dr. Fahd/ Dr. Najam		A	Dr. Romessa
Thursday	B		A	Dr. Almas		D	Dr. Maryam/ Dr. Afsheen/ Dr. Farah	E	Dr. Farid/ Dr. Ali Zain		C	Dr. Romessa
Saturday	A		E	Dr. Romessa		C	Dr. Fahd/Dr. Najam/Dr. Ali	D	Dr. Maryam/ Dr. Afsheen		B	Dr. Rahat

Table No. 2 Batch Distribution and Venues for Anatomy Small Group Discussion SGDs / Dissections

Batches	Roll No	Anatomy Teacher	Venue
A	01-90	Dr Sajjad	New Lecture theatre complex no.2
B	91-180	Dr Qurat ul Ain	Anatomy Lecture Hall No.03
C	181-270	Dr Zeneara	Anatomy Lecture Hall No.04
D	271- onwards	Dr Ali Raza	New Lecture theatre complex no.3

Supervised by Prof. Dr. Ayesha Yousaf

Table No. 3 Batch Distribution with Venues and Teachers Name for Problem Based Learning (PBL) Sessions

Sr No.	Batches	Roll No	Venue	Teachers	Sr No.	Batches	Roll No	Venue	Teachers
1.	A1	(01-35)	Lecture Hall no.05 Physiology	Dr. Sana Latif (Demostrator Biochemistry)	6.	C2	(176-210)	Lecture Hall no.04 (Basement)	Dr. Nayab Zonish (PGT Physiology)
2.	A2	(36-70)	Lecture Hall #.04 (1st Floor Anatomy)	Dr. Farah (Demonstrator of Physiology)	7.	D1	(210-245)	Lecture Hall no.02 (Basement)	Dr. Iqra Ayub (PGT Physiology)
3.	B1	(71-105)	Anatomy Museum (First Floor Anatomy)	Dr. Romessa (Demostrator Biochemistry)	8.	D2	(246-280)	Conference Room (Basement)	Dr. Rahat Afzal (Senior Demonstrator Biochemistry)
4.	B2	(106-140)	Lecture Hall no.03 (First Floor)	Dr. Ali Raza (Senior Demonstrator of Anatomy)	9.	E1	(281-315)	New Lecture Hall no.01	Dr. Ramsha (PGT Physiology)
5.	C1	(141-175)	Lecture Hall no.05 (Basement)	Dr. Ali Zain (PGT Physiology)	10	E2	(315 onwards)	Lecture Hall no.04	Dr. Jawad Hassan (Demonstrator Physiology)

Table No. 6 Venues for Large Group Interactive Session (LGIS)

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

First Year Timetable for CVS Module (Second Week)
19-09-2024 to 25-09-2024

Date/Day	8:00 AM – 09:00 AM	09:00 AM – 10:00 AM	10:00am – 10:20am	10:20am-11:20am	11:20am-12:10pm		12:10pm-12:30pm	12:30pm – 2:00pm	Home Assignment
Thursday 19-09-2024	**CBL/DISSECTION**		**Break**	**MEDICINE(LGIS)**	**PHYSIOLOGY (LGIS)**		**Break**	Practical &CBL Topics mentioned at the end	SDL Physiology Regulation of blood flow
	Pericardium / Cardiac tamponade			Hypertension	Functions of veins, Venous return and factors affecting venous return	Capillary circulation, Concept of vasomotion and starling forces			
				Dr. Asad cardiologist (Even)	Dr Kamil (Even)	Dr Fahad (Odd)			
Date/Day	**8:00AM – 09:00 AM**	**09:00AM – 10:00 AM**		**10:00 AM – 11:00 AM**	**11:00 AM – 12:00 PM**				
Friday 20-09-2024	**QURAN TRANSLATION -III**	**QURAN TRANSLATION -IV**		**PBL 1 (SESSION II)**	**PHYSIOLOGY (LGIS)**		SDL Physiology Introduction to ECG & its clinical importance		
	Mumamalat -II / Mufti Naeem (even)	Ekhlaqiaat-I / Molana Abdul Wahid (Odd)		PBL Team	Introduction to ECG & its clinical importance	Cardiac output & its control, measurement of cardiac output, pathologically high and low cardiac output-I			
	Ekhlaqiaat-I / Molana Abdul Wahid (even)	Mumamalat-II / Mufti Naeem (Odd)			Dr Fahd (Odd)	Dr Sidra (Even)			
Saturday 21-09-2024	**DISSECTION/SGD**		**Break**	**ANATOMY (LGIS)**	**PHYSIOLOGY (LGIS)**		**Break**	Practical &CBL Topics mentioned at the end	SDL Biochemistry Fatty acids & Simple lipids
	Heart (External Features)			**Embryology** / (Aortic Arches and derivatives) / Prof. Dr. Ayesha / Assoc Prof. Dr. Arsalan (Even)	**General Anatomy** / (Classification of vessels) / Prof. Dr. Saima (Odd)	Cardiac output & its control, measurement of cardiac output, pathologically high and low cardiac output-II / Dr. Sidra (Odd)	Introduction to ECG & its clinical importance / Dr Fahd (Even)		
Monday 23-09-2024	**DISSECTION/SGD**			**ANATOMY (LGIS)**	**PHYSIOLOGY (LGIS)**			Practical &CBL Topics mentioned at the end	SDL Biochemistry Classification and Chemical reactions of Monosaccharides
	Heart (Clinical Correlations of Heart)			**Histology** / (Arteries and Veins) / Assoc. Prof. Dr. Mohtasham (Even)	**Embryology** / (Formation, Position and Partitioning of heart tube) / Prof. Dr. Ayesha / Assoc Prof. Dr. Arsalan (Odd)	Vectorial analysis & arrhythmias I / Dr. Fahad (even)	Cardiac cycle - I, Events of cardiac cycle and its graphical representation / Dr Sidra (Odd)		
Tuesday 24-09-2024	**DISSECTION/SGD**			**BIOCHEMISTRY (LGIS)**	**PHYSIOLOGY (LGIS)**			Practical &CBL Topics mentioned at the end	SDL Anatomy Heart
	Heart (Internal Features)			Mutarotation & Monosaccharides & their chemical reaction / Dr. Uzma (Even)	Simple lipids & Compound lipids / Dr. Aneela (Odd)	Cardiac cycle - I, Events of cardiac cycle and its graphical representation / Dr Sidra (even)	Vectorial analysis & arrhythmias I / Dr Fahd (Odd)		
Wednesday 25-09-2024	**BEHAVIOUR SCIENCES**	**BIOCHEMISTRY (LGIS)**		**PATHOLOGY (LGIS)**	**PHYSIOLOGY (LGIS)**			Practical &CBL Topics mentioned at the end	SDL Anatomy Vassculature of Heart Online Evaluation
	Anthropology & Health	Simple lipids & Compound lipids / Mutarotation & Monosaccharides & their chemical reaction		Edema / Dr. Sara Rafi (Even) / Dr Rabia Khalid (Odd)	Arrhythmias II / Dr. Fahd (Even)	Cardiac cycle – II, Functions of ventricles as pumps, aortic pressure curve, regulation of heart pumping / Dr. Sidra (Odd)			
	Dr. Mehboob Ali Shah (Even) / Dr. Mehmood Ali Khan (Odd)	Dr. Aneela (even) / Dr Uzma (Odd)							

Table No. 1 (Time: 12:20pm – 02:00pm)

Batch Distribution for Practical Skills (all subjects)
CBL / Small Group Disscusion (Biochemistry and Physiology)

Sr. No	Batch	Roll No.
1.	A	01-70
2.	B	71-140
3.	C	141-210
4.	D	211-280
5.	E	281-onwards

Topics for Skill Lab with Venue

- Medium & Small Sized Arteries (Anatomy/ Histology-practical) venue Histology Laboratory (Dr. Kashif)
- 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

Schedule for Practical / Small Group Discussion

Day	Histology Practical		Biochemistry Practical			Physiology Practical		Physiology SGD			Biochemistry SGD	
	Batch	Teacher Name	Batch	Teacher Name		Batch	Teacher Name	Batch	Teacher Name		Batch	Teacher Name
Monday	C	Supervised by HOD	B	Dr. Rahat	Supervised by HOD	E	Dr. Farid/ Dr. Ali Zain/Dr. Usman	A	Dr. Sheena/Dr. Nazia	Supervised by HOD	D	Dr. Uzma
Tuesday	D		C	Dr. Romessa		A	Dr. Sheena/ Dr..Nazia/Dr. Afsheen	B	Dr. Uzma/Dr. Farah		E	Dr. Almas
Wednesday	E		D	Dr. Uzma		B	Dr. Uzma/ Dr. Farah/Dr/ Ramsha	C	Dr. Fahd/ Dr. Najam		A	Dr. Romessa
Thursday	B		A	Dr. Almas		D	Dr. Maryam/ Dr. Afsheen/ Dr. Farah	E	Dr. Farid/ Dr. Ali Zain		C	Dr. Romessa
Saturday	A		E	Dr. Romessa		C	Dr. Fahd/Dr. Najam/Dr. Ali	D	Dr. Maryam/ Dr. Afsheen		B	Dr. Rahat

Topics for SGDs / CBL with Venue

- Biochemistry tutorial – Classification & Properties of Fatty Acids. (Biochemistry Basement demo room)
- Physiology CBL- Pitting edema (Physiology Lecture Hall No.05)

Table No. 2 Batch Distribution and Venues for Anatomy Small Group Discussion SGDs / Dissections

Batches	Roll No	Anatomy Teacher	Venue
A	01-90	Dr Sajjad	New Lecture theatre complex no.2
B	91-180	Dr Qurat ul Ain	Anatomy Lecture Hall No.03
C	181-270	Dr Zeneara	Anatomy Lecture Hall No.04
D	271- onwards	Dr Ali Raza	New Lecture theatre complex no.3

Supervised by Prof. Dr. Ayesha Yousaf

Table No. 3 Batch Distribution with Venues and Teachers Name for Problem Based Learning (PBL) Sessions

Sr No.	Batches	Roll No	Venue	Teachers	Sr No.	Batches	Roll No	Venue	Teachers
1.	A1	(01-35)	Lecture Hall no.05 Physiology	Dr. Sana Latif (Demostrator Biochemistry)	6.	C2	(176-210)	Lecture Hall no.04 (Basement)	Dr. Nayab Zonish (PGT Physiology)
2.	A2	(36-70)	Lecture Hall #.04 (1st Floor Anatomy)	Dr. Farah (Demonstrator of Physiology)	7.	D1	(210-245)	Lecture Hall no.02 (Basement)	Dr. Iqra Ayub (PGT Physiology)
3.	B1	(71-105)	Anatomy Museum (First Floor Anatomy)	Dr. Romessa (Demostrator Biochemistry)	8.	D2	(246-280)	Conference Room (Basement)	Dr. Rahat Afzal (Senior Demonstrator Biochemistry)
4.	B2	(106-140)	Lecture Hall no.03 (First Floor)	Dr. Ali Raza (Senior Demonstrator of Anatomy)	9.	E1	(281-315)	New Lecture Hall no.01	Dr. Ramsha (PGT Physiology)
5.	C1	(141-175)	Lecture Hall no.05 (Basement)	Dr. Ali Zain (PGT Physiology)	10	E2	(315 onwards)	Lecture Hall no.04	Dr. Jawad Hassan (Demonstrator Physiology)

Table No. 6 Venues for Large Group Interactive Session (LGIS)

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

First Year Timetable for CVS Module (Third Week)
26-09-2024 to 02-10-2024

Date/Day	8:00 AM – 09:00 AM	09:00 AM – 10:00 AM	10:00am – 10:20am	10:20am-11:20am		11:20am-12:10pm		12:10pm-12:30pm	12:30pm – 2:00pm	Home Assignment
Thursday 26-09-2024	DISSECTION/SGD		Break	ANATOMY (LGIS)		PHYSIOLOGY (LGIS)		Break	Practical &CBL Topics mentioned at the end	SDL Physiology Regulation of BP
	Vassculature of Heart (Coarctation of Aorta)			Embryology (Formation, Position and Partitioning of heart tube)	Histology (Arteries and Veins)	Cardiac cycle – II, Functions of ventricles as pumps, aortic pressure curve, regulation of heart pumping	Arrhythmias II			
				Prof. Dr. Ayesha / Assoc Prof. Dr. Arsalan (Even)	Assoc. Prof. Dr. Mohtasham (Odd)	Dr. Sidra (Even)	Dr. Fahd (Odd)			
Date/Day	**8:00AM – 10:00 AM**		**10:00AM – 11:00 AM**			**11:00 AM – 12:00 PM**				
Friday 27-09-2024	DISSECTION/SGD		ANATOMY (LGIS)			PHYSIOLOGY (LGIS)		SDL Physiology Regulation of BP		
	Innervation of Heart		Embryology (Formation and partitioning of Ventricles)		Histology (Capillaries)	ECG changes in myocardial hypertrophies, ischemic heart disease	Short term regulation of blood pressure			
			Prof. Dr. Ayesha / Assoc Prof. Dr. Arsalan (Even)		Assoc. Prof. Dr. Mohtasham (Odd)	Dr. Fahd (Even)	Prof.Dr. Samia / Dr.Kamil (Odd)			
Saturday 28-09-2024	BIOCHEMISTRY (LGIS)	FAMILY MEDICINE	Break	ANATOMY (LGIS)		PHYSIOLOGY (LGIS)		Break	Practical &CBL Topics mentioned at the end	SDL Biochemistry Disaccharides
	Derived lipids / Disaccharides &homopolysaccharides	Approach to a patient with chest pain		Histology (Capillaries)	Embryology (Formation and partitioning of Ventricles)	Short term regulation of blood pressure	ECG changes in myocardial hypertrophies, ischemic heart disease			
	Dr. Kahif (even) / Dr. Uzma/Dr. Aneela (Odd)	Dr Sadia khan		Assoc. Prof. Dr. Mohtasham (Even)	Prof. Dr. Ayesha / Assoc Prof. Dr. Arsalan (Odd)	Prof. Dr. Samia / Dr. Kamil (Even)	Dr. Fahd (Odd)			
Monday 30-09-2024	DISSECTION/CBL			PHYSIOLOGY (LGIS)		PHYSIOLOGY (LGIS)			Practical &CBL Topics mentioned at the end	SDL Biochemistry Compound lipids
	Superior Mediastinum (Trachea, Esophagus Ascending Aorta) (Coarctaion of Aorta)			Splanchnic circulation, cutaneous circulation	Skeletal muscle blood flow, Cardiovascular changes during exercise	Congestive cardiac failure	Long term regulation of blood pressure			
				Dr. Fareed (Even)	Dr Uzma (Odd)	Dr.Fareed (Even)	Prof..Dr. Samia / Dr. Kamil (Odd)			
Tuesday 01-10-2024	ARTIFICIAL INTELLIGENCE	BIOCHEMISTRY (LGIS)		ANATOMY (LGIS)		PHYSIOLOGY (LGIS)			Practical &CBL Topics mentioned at the end	SDL Anatomy Innervation of Heart
	Guest Lecture	Disaccharides &homopolysaccharides / Derived lipids		Embryology (Fetal Circulation)	Histology (Tunics of heart & Lyphatic System)	Long term regulation of blood pressure	Congestive cardiac failure			
	Prof. Dr. Riaz Sheikh	Dr. Uzma/Dr. Aneela (Even) / Dr. Kahif (Odd)		Prof. Dr. Ayesha / Assoc Prof. Dr. Arsalan (Even)	Assoc. Prof. Dr. Mohtasham (Odd)	Prof.Dr. Samia /Dr. Kamil (Even)	Dr. Fareed (Odd)			
Wednesday 02-10-2024	Early Clinical Exposure									

Table No. 1 (Time: 12:20pm – 02:00pm)

Batch Distribution for Practical Skills (all subjects) CBL / Small Group Disscusion (Biochemistry and Physiology)		
Sr. No	Batch	Roll No.
1.	A	01-70
2.	B	71-140
3.	C	141-210
4.	D	211-280
5.	E	281-onwards

Topics for Skill Lab with Venue

- Large Veins (Anatomy/ Histology-practical) venue Histology Laboratory (Dr. Kashif)
- 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

Topics for SGDs / CBL with Venue

- Biochemistry CBL- Atherosclerosis.
- Physiology CBL Palpitations / Tachycardia (Physiology Lecture Hall No.05)
- Anatomy CBL: Coarctation of Aorta

Schedule for Practical / Small Group Discussion

Day	Histology Practical		Biochemistry Practical			Physiology Practical		Physiology SGD			Biochemistry SGD	
	Batch	Teacher Name	Batch	Teacher Name		Batch	Teacher Name	Batch	Teacher Name		Batch	Teacher Name
Monday	C	Supervised by HOD	B	Dr. Rahat	Supervised by HOD	E	Dr. Farid/ Dr. Ali Zain/Dr. Usman	A	Dr. Sheena/Dr. Nazia	Supervised by HOD	D	Dr. Uzma
Tuesday	D		C	Dr. Nayab		A	Dr. Sheena/ Dr..Nazia/Dr. Afsheen	B	Dr. Uzma/Dr. Farah		E	Dr. Almas
Wednesday	E		D	Dr. Uzma		B	Dr. Uzma/ Dr. Farah/Dr/ Ramsha	C	Dr. Fahd/ Dr. Najam		A	Dr. Romessa
Thursday	B		A	Dr. Almas		D	Dr. Maryam/ Dr. Afsheen/ Dr. Farah	E	Dr. Farid/ Dr. Ali Zain		C	Dr.Romessa
Saturday	A		E	Dr. Romessa		C	Dr. Fahd/Dr. Najam/Dr. Ali	D	Dr. Maryam/ Dr. Afsheen		B	Dr. Rahat

Table No. 2 Batch Distribution and Venues for Anatomy Small Group Discussion SGDs / Dissections

Batches	Roll No	Anatomy Teacher	Venue
A	01-90	Dr Sajjad	New Lecture theatre complex no.2
B	91-180	Dr Qurat ul Ain	Anatomy Lecture Hall No.03
C	181-270	Dr Zeneara	Anatomy Lecture Hall No.04
D	271- onwards	Dr Ali Raza	New Lecture theatre complex no.3

Supervised by Prof. Dr. Ayesha Yousaf

Table No. 3 Batch Distribution with Venues and Teachers Name for Problem Based Learning (PBL) Sessions

Sr No.	Batches	Roll No	Venue	Teachers	Sr No.	Batches	Roll No	Venue	Teachers
1.	A1	(01-35)	Lecture Hall no.05 Physiology	Dr. Sana Latif (Demostrator Biochemistry)	6.	C2	(176-210)	Lecture Hall no.04 (Basement)	Dr. Nayab Zonish (PGT Physiology)
2.	A2	(36-70)	Lecture Hall #.04 (1st Floor Anatomy)	Dr. Farah (Demonstrator of Physiology)	7.	D1	(210-245)	Lecture Hall no.02 (Basement)	Dr. Iqra Ayub (PGT Physiology)
3.	B1	(71-105)	Anatomy Museum (First Floor Anatomy)	Dr. Romessa (Demostrator Biochemistry)	8.	D2	(246-280)	Conference Room (Basement)	Dr. Rahat Afzal (Senior Demonstrator Biochemistry)
4.	B2	(106-140)	Lecture Hall no.03 (First Floor)	Dr. Ali Raza (Senior Demonstrator of Anatomy)	9.	E1	(281-315)	New Lecture Hall no.01	Dr. Ramsha (PGT Physiology)
5.	C1	(141-175)	Lecture Hall no.05 (Basement)	Dr. Ali Zain (PGT Physiology)	10	E2	(315 onwards)	Lecture Hall no.04	Dr. Jawad Hassan (Demonstrator Physiology)

No PBL Session during this week

Table No. 6 Venues for Large Group Interactive Session (LGIS)

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

First Year Timetable for CVS Module (Fourth Week)
03-10-2024 to 09-10-2024

Date/Day	8:00 AM – 09:00 AM	09:00 AM – 10:00 AM	10:00am – 10:20am	10:20am-11:20am	11:20am-12:10pm	12:10pm-12:30pm	12:30pm – 2:00pm	Home Assignment
Thursday 03-10-2024	**DISSECTION/SGD** Posterior mediastinum (Contents)		**Break**	**PBL 2 (SESSION I)** PBL Team	**PHYSIOLOGY (LGIS)** Fetal circulation & cardiac abnormalities in fetal circulation – Dr.Fahad (Even) Circulatory shock – Prof. Dr. Samia Sarwar / Dr. Fareed (Odd)	**Break**	Practical &CBL Topics mentioned at the end.	SDL Anatomy Superior Mediastinum
Date/Day	**8:00AM – 09:00 AM**	**09:00AM – 10:00 AM**	**10:00 AM – 11:00 AM**		**11:00 AM – 12:00 PM**			
Friday 04-10-2024	**GYNAE & OBS (LGIS)** Cardiovascular changes in pregnancy, common cardiac diseases – Dr. Sara Eijaz (Even), Dr. Sadia Bano (Odd)	**PHYSIOLOGY (LGIS)** Skeletal muscle blood flow, Cardiovascular changes during exercise – Dr. Uzma (Even) Splanchnic circulation, cutaneous circulation – Dr. Fareed (Odd)	Practical &CBL Topics mentioned at the end **Tuesday Batch 17-09-2024**		**PHYSIOLOGY (LGIS)** Circulatory shock – Prof. Dr. Samia Sarwar / Dr. Fareed (Even) Fetal circulation & cardiac abnormalities in fetal circulation – Dr .Fahad (Odd)		SDL Physiology Vectorial analysis & arrhythmias	
Saturday 05-10-2024	**RADIOLOGY (LGIS)** Chest radiograph with perspective of cardiovascular system – Dr Aniqua (Even), Dr. Fiza (Odd)	**BIOMEDICAL CLUB ACTIVITY III** PBL Team	**ANATOMY (LGIS)** **Histology** (Tunics of heart & Lyphatic System) – Assoc. Prof. Dr. Mohtasham (Even) **Embryology** (Fetal Circulation) – Prof. Dr. Ayesha / Assoc Prof. Dr. Arsalan (Odd)		**PHYSIOLOGY (LGIS)** Coronary circulation, Atherosclerosis & acute coronary occlusion – Prof.Dr. Samia/ Dr. kamil (Even) Short term regulation of blood pressure – Dr. Afsheen SDL (Odd)	**Break**	Practical &CBL Topics mentioned at the end	SDL Physiology Cardiac cycle
Monday 07-10-2024	**PHARMACOLOGY** Clinical Pharmacology of Anti hypertensive drugs – (Even) (Odd)	**BIOCHEMISTRY(LGIS)** Heteropolysaccharides – Dr. Kashif (even) Prostaglandins – Dr. Aneela (Odd)	**Break**	**GYNAE & OBS (LGIS)** Hypertensive disorders in pregnancy (gestational hypertension, pre-eclampsia) – Dr Amna Abbasi (Even), Dr. Farah Deeba (Odd)	**PHYSIOLOGY (LGIS)** Short term regulation of blood pressure – Dr. Afsheen SDL (Even) Coronary circulation, Atherosclerosis & acute coronary occlusion – Prof. Dr. Samia/ Dr. Kamil (Odd)	**Break**	Practical &CBL Topics mentioned at the end	SDL Biochemistry Prostaglandins
Tuesday 08-10-2024	**DISSECTION/SGD** Posterior Mediastinum (Azygous system of Veins)			**BIOCHEMISTRY(LGIS)** Prostaglandins – Dr. Aneela (even) Heteropolysaccharides – Dr. Kashif (Odd)	**EYE LGIS** Retinal changes in hypertension – Dr. Maria (Even), Dr. Saira (Odd)		Practical &CBL Topics mentioned at the end	SDL Biochemistry Heteropoly saccharides
Wednesday 09-10-2024	**DISSECTION/SGD** Cross Sectional Anatomy / Radiology			**PBL 2 (SESSION II)** PBL Team	Practical &CBL Topics mentioned at the end **Wednesday Batch 02-10-2024**		Practical &CBL Topics mentioned at the end	SDL Anatomy Posterior Mediastinum Online ClinicalEvaluation

Table No. 1 (Time: 12:20pm – 02:00pm)

Batch Distribution for Practical Skills (all subjects) CBL / Small Group Disscusion (Biochemistry and Physiology)		
Sr. No	Batch	Roll No.
1.	A	01-70
2.	B	71-140
3.	C	141-210
4.	D	211-280
5.	E	281-onwards

Topics for Skill Lab with Venue

- Medium & Small Sized Veins (Anatomy/ Histology-practical) venue Histology Laboratory (Dr. Kashif)
- Iodine Test (Biochemistry practical) venue- Biochemistry Laboratory
- Cardiopulmonary resuscitation (CPR) (Physiology –practical) Physiology Laboratory
- Demonstration of Triple Response (Physiology –practical) (Physiology Physiology Laboratory

Topics for SGDs / CBL with Venue

- 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	
	Batch	Teacher Name	Batch	Teacher Name		Batch	Teacher Name	Batch	Teacher Name		Batch	Teacher Name
Monday	C	Supervised by HOD	B	Dr. Rahat	Supervised by HOD	E	Dr. Farid/ Dr. Ali Zain/Dr. Usman	A	Dr. Sheena/Dr. Nazia	Supervised by HOD	D	Dr. Uzma
Tuesday	D		C	Dr. Romessa		A	Dr. Sheena/ Dr..Nazia/Dr. Afsheen	B	Dr. Uzma/Dr. Farah		E	Dr. Almas
Wednesday	E		D	Dr. Uzma		B	Dr. Uzma/ Dr. Farah/Dr/ Ramsha	C	Dr. Fahd/ Dr. Najam		A	Dr. Romessa
Thursday	B		A	Dr. Almas		D	Dr. Maryam/ Dr. Afsheen/ Dr. Farah	E	Dr. Farid/ Dr. Ali Zain		C	Dr. Romessa
Saturday	A		E	Dr. Romessa		C	Dr. Fahd/Dr. Najam/Dr. Ali	D	Dr. Maryam/ Dr. Afsheen		B	Dr. Rahat

Table No. 2 Batch Distribution and Venues for Anatomy Small Group Discussion SGDs / Dissections

Batches	Roll No	Anatomy Teacher	Venue
A	01-90	Dr Sajjad	New Lecture theatre complex no.2
B	91-180	Dr Qurat ul Ain	Anatomy Lecture Hall No.03
C	181-270	Dr Zeneara	Anatomy Lecture Hall No.04
D	271- onwards	Dr Ali Raza	New Lecture theatre complex no.3

Supervised by Prof. Dr. Ayesha Yousaf

Table No. 3 Batch Distribution with Venues and Teachers Name for Problem Based Learning (PBL) Sessions

Sr No.	Batches	Roll No	Venue	Teachers	Sr No.	Batches	Roll No	Venue	Teachers
1.	A1	(01-35)	Lecture Hall no.05 Physiology	Dr. Sana Latif (Demostrator Biochemistry)	6.	C2	(176-210)	Lecture Hall no.04 (Basement)	Dr. Nayab Zonish (PGT Physiology)
2.	A2	(36-70)	Lecture Hall #.04 (1st Floor Anatomy)	Dr. Farah (Demonstrator of Physiology)	7.	D1	(210-245)	Lecture Hall no.02 (Basement)	Dr. Iqra Ayub (PGT Physiology)
3.	B1	(71-105)	Anatomy Museum (First Floor Anatomy)	Dr. Romessa (Demostrator Biochemistry)	8.	D2	(246-280)	Conference Room (Basement)	Dr. Rahat Afzal (Senior Demonstrator Biochemistry)
4.	B2	(106-140)	Lecture Hall no.03 (First Floor)	Dr. Ali Raza (Senior Demonstrator of Anatomy)	9.	E1	(281-315)	New Lecture Hall no.01	Dr. Ramsha (PGT Physiology)
5.	C1	(141-175)	Lecture Hall no.05 (Basement)	Dr. Ali Zain (PGT Physiology)	10	E2	(315 onwards)	Lecture Hall no.04	Dr. Jawad Hassan (Demonstrator Physiology)

Table No. 6 Venues for Large Group Interactive Session (LGIS)

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

Schedule for LMS Based Weekly Online Assessments for First Year MBBS (CVS Module)

The online assessment for CVS Module for First Year MBBS will be as per following schedule:

Class	Module	Day & Date	Time of Assessment	Focal person	Department Responsible
First Year MBBS	CVS Module	Monday 23-09-2024	7:00 pm-7:30pm	Prof. Dr Ayesha Yousaf	Anatomy
		Tuesday 24-09-2024	7:00 pm-7:30pm	Prof. Dr Samia Sarwar	Physiology
		Wednesday 25-09-2024	7:00 pm-7:30pm	Dr Aneela Jamil	Biochemistry
		Monday 30-09-2024	7:00 pm-7:30pm	Prof. Dr Ayesha Yousaf	Anatomy
		Tuesday 01-10-2024	7:00 pm-7:30pm	Prof. Dr Samia Sarwar	Physiology
		Wednesday 02-10-2024	7:00 pm-7:30pm	Dr Aneela Jamil	Biochemistry

First Year Timetable for CVS Module (Fifth Week)
10-10-2024 to 16-10-2024

DAY/ TIME	8:00AM– 02:00pm
Thursday 10-10-2024	Assessment Week
Friday 11-10-2024	
Saturday 12-10-2024	
Monday 14-10-2024	
Tuesday 15-10-2024	
Wednesday 16-10-2024	

SECTION VII

Table of Specification (TOS) For CVS Module Examination for First Year MBBS

Domains: C-Core Subject (70%) Levels C1-C2, HV- Horizontal & Vertical Integration (20%) Levels C2-C3, S- Spiral Integration (10%) Levels C2-C3

End of Module Assessment	Subject	Theory (Cognitive) Assessment																			Practical (Skill & Attitude) Assessment											Grand Total	Total Time of Module Assessment
		MCQs					EMQs			SAQs					SEQs				Marks	Total Marks Theory	Total Time	AV OSPE					Time	AED Reflective Writing	OSVE			Total Practical Marks		
		C	HV	S	Total	Marks	C	Total	Marks	C	HV	S	Total	Marks	C	HV	S	Total				C	HV	S	Total	Marks			Viva	Copy	Total			
First Module	Anatomy	19	4	2	25	25	1	1	5	3	1	1	5	25	3	1	1	5	45	100	2 HRS	7	2	1	10	50	50 min	15 min	45	5	50	100	200	6 HRS
	Physiology	19	4	2	25	25	1	1	5	3	1	1	5	25	3	1	1	5	45	100	2 HRS	7	2	1	10	50	50 min	15 min	45	5	50	100	200	6 HRS
	Biochemistry	19	4	2	25	25	1	1	5	3	1	1	5	25	3	1	1	5	45	100	2 HRS	7	2	1	10	50	50 min	15 min	45	5	50	100	200	6 HRS
Formative- Weekly LMS Based Assessment of 30 MCQs (10 MCQs per Subject)																																	
End of Module Assessment	Subject	Theory (Cognitive) Assessment																			Practical (Skill & Attitude) Assessment											Grand Total	Total Time of Module Assessment
		MCQs					EMQs			SAQs					SEQs				Marks	Total Marks Theory	Total Time	AV OSPE					Time	AED Reflective Writing	OSVE			Total Practical Marks		
		C	HV	S	Total	Marks	C	Total	Marks	C	HV	S	Total	Marks	C	HV	S	Total				C	HV	S	Total	Marks			Viva	Copy	Total			
Second Module	Anatomy	19	4	2	25	25	1	1	5	3	1	1	5	25	3	1	1	5	45	100	2 HRS	7	2	1	10	50	50 min	15 min	45	5	50	100	200	6 HRS
	Physiology	19	4	2	25	25	1	1	5	3	1	1	5	25	3	1	1	5	45	100	2 HRS	7	2	1	10	50	50 min	15 min	45	5	50	100	200	6 HRS
	Biochemistry	19	4	2	25	25	1	1	5	3	1	1	5	25	3	1	1	5	45	100	2 HRS	7	2	1	10	50	50 min	15 min	45	5	50	100	200	6 HRS
Formative- Weekly LMS Based Assessmen tof 30 MCQs (10 MCQs per Subject)																																	

Block	Subjects	LMS Based Assessment					OSPE						Grand Total	Total Block Time
		MCQs					LabOSPE	IOSPE	COSPE	Total	Marks	Time		
		C	HV	S	Total	Time	C	HV	S					
BLOCK	Anatomy	21	6	3	30	30 min	14	4	2	20	60	6 HRS	90	10 HRS
	Physiology	21	6	3	30	30 min	14	4	2	20	60	6 HRS	90	10 HRS
	Biochemistry	21	6	3	30	30 min	14	4	2	20	60	6 HRS	90	10 HRS
50% Questions/OSPE Stations/Viva Stations will be from Foundation Module and 50% Questions will be from MSK-1 Module														
For Each assessment student will have to individually pass Theory and Practical components														

Weekly LMS Assessment			
Subjects	Anatomy	Physiology	Biochemist
No of MCQs*	30	30	30
Marks/MCQ	30	30	30
*MCQ=1 Mark each, 1 min each			

Marks per Item

MCQ=1	EMQ= 5	SAQ= 5	SEQ= 9	AVOSPE= 5		OSPE= 3
OSPE Time=1 Round of 40 Students =80 min						
3 Round of 40 Students =240 min						
OSVE=Time per student=5mins						

Annexure I

(Sample MCQ, SAQ, SEQ Papers, & AV OSPE)

Note: These sample papers aim to facilitate comprehension. However, it's important to note that the content and format of actual assessment papers may differ

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

Note: MCQs on USMLE Pattern

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. (4)

   b. What is a moderator band? (2)

   c. Define sudden death syndrome. (3)

2. a. What is Secondery Heart Field (2)

   b. Discuss formation and partitioning of heart tube. (4)

   c. Enlist different types of interatrial septal defects. (3)

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

Note: MCQs on USMLE Pattern

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 a. Draw and label a normal electrocardiogram. (6)

b. Give the normal duration of PR Interval, (2)

c. In which condition the PR Interval is prolonged. (1)

Q.2 a. Define cardiac output. (2)

b. Give its normal values in males and females. (1)

c. Discuss factors causing hypoeffective heart. (6)

Physiology Sample of EMQ

Hypertension Physiology and Management
Instructions: Match the following options (A-E) with the descriptions or statements (1-5) below.
Options:
A. Nitric Oxide
B. Aldosterone
C. Amlodipine
D. Lifestyle Modifications
E. Angiotensin Receptor Blockers (ARBs)
Statements: -
1. This hormone increases sodium reabsorption in the kidneys, leading to increased blood volume and blood pressure.
2. Medications that block the effects of angiotensin II on blood vessels, promoting vasodilation and lowering blood pressure.
3. Important strategies including diet and exercise to manage hypertension.
4. A calcium channel blocker that relaxes blood vessels by inhibiting calcium influx into vascular smooth muscle.
5. Endogenous vasodilator released by endothelial cells that helps regulate blood pressure.
Match the options with the statements:
Answers:
A-5
B-1
C-4
D-3
E-2

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. 03

b. Describe structure Glycolipids 03

c. Discuss functions of glycolipids. 03

RAWALPINDI MEDICAL UNIVERSITY

CVS MODULE EXAMINATION

1ST YEAR MBBS

EMQs PAPER

A 50-year-old man arrives at the emergency department complaining of sudden chest pain that radiates to his left arm. He appears sweaty and distressed. The nurse notes his blood pressure is 160/90 mmHg, pulse is 100 bpm, and respiratory rate is 22/min. An ECG shows ST-segment elevation in leads II, III, and aVF.

Match the types of heart conditions with their descriptions:

Types of Heart Conditions:

A. STEMI (ST-Elevation Myocardial Infarction)

B. NSTEMI (Non-ST-Elevation Myocardial Infarction)

C. Unstable angina

D. Stable angina

E. Coronary artery spasm

Descriptions:

This condition is characterized by ST-segment elevation on the ECG, indicating a complete blockage of a coronary artery and heart muscle damage.

This condition typically presents with elevated cardiac enzymes and may show ECG changes like ST-segment depression or T-wave inversion, indicating partial blockage of a coronary artery.

Chest pain caused by reduced blood flow to the heart muscle but does not result in permanent damage or elevated cardiac enzymes.

Chest pain due to transient narrowing of coronary arteries, often unrelated to physical exertion or emotional stress.

Chest pain that occurs predictably during physical exertion or stress and resolves with rest or medication.

Matching:

Type A:

Type B:

Type C:

Type D:

Type E:

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

AV OSPE
DEPARTMENT OF ANATOMY

Slide 1

Total Marks: 05 marks

Time Allotted: 05 minutes

Requirements: Answer sheet, Pen

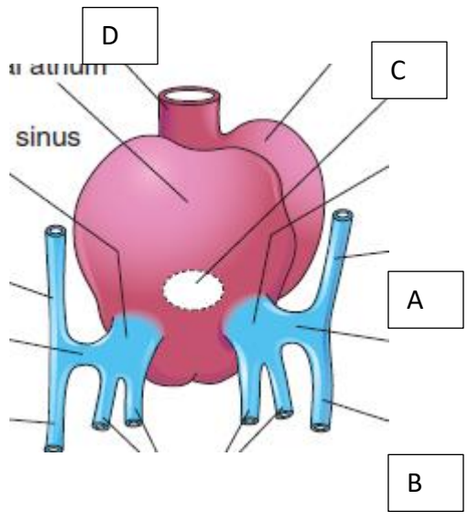
Objectives: _____

Section I: Core Concept
B. Embryology

Slide No. 1

I. Identify on the image
   - A (1)
   - B (1)
   - C (1)
   - D (1)

II. What is fate of structure 'B' (1)



AV OSPE
DEPARTMENT OF PHYSIOLOGY

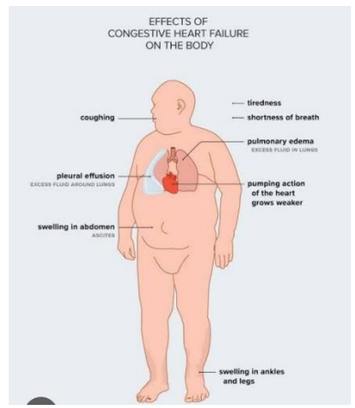
Slide 1

Total Marks: 05 marks

Time Allotted: 05 minutes

Requirements: Answer sheet, Pen

Objectives: _____



Q 1 What could be possible cause of this illness (1)

Q 2. Explain pathophysiology of right sided heart failure (1)

Q3. Explain Pathophysiology of left sided heart failure (1)

Q4. What is Ejection Fraction (1)

Q5. What are Symtopms of right sided heart failure. (1)

AV OSPE
DEPARTMENT OF BIOCHEMISTRY

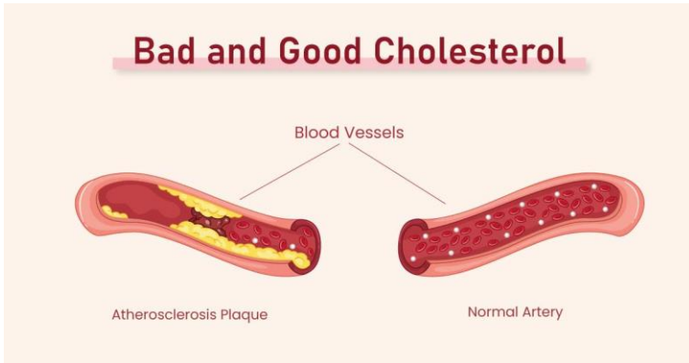
Slide 1

Total Marks: 05 marks

Time Allotted: 05 minutes

Requirements: Answer sheet, Pen

Objectives: _____



a. What is good and bad cholesterol? (1)
b. Briefly discuss the structure of cholesterol. (1)
c. What is normal range of plasma cholesterol. (1)
d. What is the most important carrier of cholesterol in Plasma (1)
e. How is plasma cholesterol level lowered. (1)