

# **Study Guide**

## **Block-III**

**1<sup>st</sup> Year MBBS**





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# Vision and Mission

## Vision & Mission of UHS

### Vision statement

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

### Mission statement

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

## Vision & Mission of SMDC

### Vision

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

*'Veritas et Devotio'*

### Mission

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

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

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

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

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

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

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# List of Abbreviations

| Abbreviations | Subjects                               |
|---------------|----------------------------------------|
| A             | Anatomy                                |
| ABG           | arterial blood gas                     |
| Ag            | Aging                                  |
| AKI           | acute kidney injury                    |
| ALT           | alanine transaminase                   |
| AMP           | Adenosine monophosphate                |
| ANS           | Autonomic Nervous System               |
| AST           | aspartate aminotransferase             |
| AV            | Atrioventricular                       |
| B             | Biochemistry                           |
| BhS           | Behavioral Sciences                    |
| C             | Civics                                 |
| CBC           | Complete Blood Count                   |
| C-FRC         | Clinical-Foundation Rotation Clerkship |
| CK            | Creatine kinase                        |
| CM            | Community Medicine                     |
| CNS           | Central Nervous System                 |
| CO            | Carbon monoxide                        |
| CO2           | Carbon dioxide                         |
| COPD          | Chronic obstructive pulmonary disease  |
| COX           | cyclooxygenase                         |
| CPR           | Cardio pulmonary Resuscitation         |
| CT            | Computed tomography                    |
| CV            | Cardiovascular                         |

---

|       |                                       |
|-------|---------------------------------------|
| CVA   | cerebral vascular accident            |
| DALY  | Disability-Adjusted Life Year         |
| DCMLS | Dorsal column medial lemniscus system |
| DLC   | differential Leukocyte Count          |
| DNA   | Deoxy Ribonucleic Acid                |
| ECF   | Extra Cellular Fluid                  |
| ECG   | Electrocardiography                   |
| ECP   | Emergency contraceptive pills         |
| EEG   | Electroencephalogram                  |
| EnR   | Endocrinology & Reproduction          |
| ENT   | Ear Nose Throat                       |
| ER    | Emergency Room                        |
| F     | Foundation                            |
| FEV1  | Forced Expiratory Volume 1            |
| FM    | Forensic Medicine                     |
| FVC   | Forced Vital Capacity                 |
| GFR   | Glomerular Filtration Rate            |
| GIT   | Gastrointestinal tract                |
| GMP   | guanosine monophosphate               |
| GO    | Gynecology and Obstetrics             |
| GTO   | Golgi Tendon Organ                    |
| HCL   | Hydrochloric acid                     |
| H & E | Hematoxylin and eosin                 |
| HL    | Hematopoietic & Lymphatic             |

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|      |                                   |
|------|-----------------------------------|
| HMP  | Hexose Monophosphate              |
| HNSS | Head & Neck and Special Senses    |
| ICF  | Intra Cellular Fluid              |
| IL   | Interleukin                       |
| IN   | Inflammation                      |
| INR  | International Normalized Ratio    |
| IUD  | Intrauterine device               |
| IUGR | Intra Uterine Growth Restriction  |
| JVP  | Jugular Venous Pulse              |
| LDH  | Lactate Dehydrogenase             |
| M    | Medicine                          |
| MALT | Mucosa Associated Lymphoid Tissue |
| MCH  | Mean Corpuscular Volume           |
| MCV  | Mean Corpuscular Volume           |
| MRI  | Magnetic resonance imaging        |
| MS   | Musculoskeletal                   |
| MSD  | Musculoskeletal disorders         |
| NEAA | non-essential amino acids         |
| NMJ  | Neuro Muscular Junction           |
| NS   | Neurosciences                     |
| O    | Ophthalmology                     |
| Or   | Orientation                       |
| P    | Physiology                        |

|       |                                               |
|-------|-----------------------------------------------|
| Pa    | Pathology                                     |
| PAF   | Platelet activating factor                    |
| PBL   | Problem Based Learning                        |
| PCR   | Polymerase Chain Reaction                     |
| PDGF  | Platelet derived growth factor                |
| Pe    | Pediatrics                                    |
| PEM   | Protein Energy Malnutrition                   |
| PERLs | Professionalism, Ethics, Research, Leadership |
| Ph    | Pharmacology                                  |
| PNS   | Peripheral Nervous System                     |
| Psy   | Psychiatry                                    |
| PVC   | Premature Ventricular Contraction             |
| QALY  | Quality-Adjusted Life Year                    |
| QI    | Quran and Islamiyat                           |
| R     | Renal                                         |
| Ra    | Radiology                                     |
| RBCs  | Red Blood cells                               |
| RDA   | Recommended Dietary Allowance                 |
| Re    | Respiratory                                   |
| RFLP  | Restriction Fragment Length Polymorphism      |
| RMP   | Resting Membrane Potential                    |
| RNA   | Ribonucleic Acid                              |
| S     | Surgery                                       |

|      |                          |
|------|--------------------------|
| SA   | Sinoatrial               |
| TCA  | Tricarboxylic acid cycle |
| TNF  | Tumor Necrotic Factor    |
| USG  | Ultrasonography          |
| UTI  | Urinary Tract Infections |
| WBCs | White Blood Cells        |

# Introduction to Study Guide

This is study guide of third block of first year. This will help and guide you in studies. Your effective study habits and strategies are essential as you embark on the exciting and challenging journey to become a healthcare professional. These will serve as the pillars supporting your achievement in medical college.

This study guide is intended to help you get a deeper understanding of the subject matter and become ready for the rigors of clinical practice, all while giving you a road map for navigating the complexities of medical school education. You're transitioning from undergraduate studies and pursuing a lifelong dream of entering the medical field, this guide aims to support your academic growth and personal development.

The purpose of this study guide is to help you to synthesize and summarize the information. You might think of your study guide as a mini outline. The primary advantage of a study guide is that it introduces the amount of information to be learned. study guide provides a focus for different educational activities in which the students are engaged. It equips students with information on the topic of study and assists in management of student learning.

This study guide is organized according to modules, each focusing on a specific subject area or discipline within the modular curriculum. Within each module, you'll find a structured outline of topics, accompanied by key concepts, learning objectives, and suggested resources for further exploration.

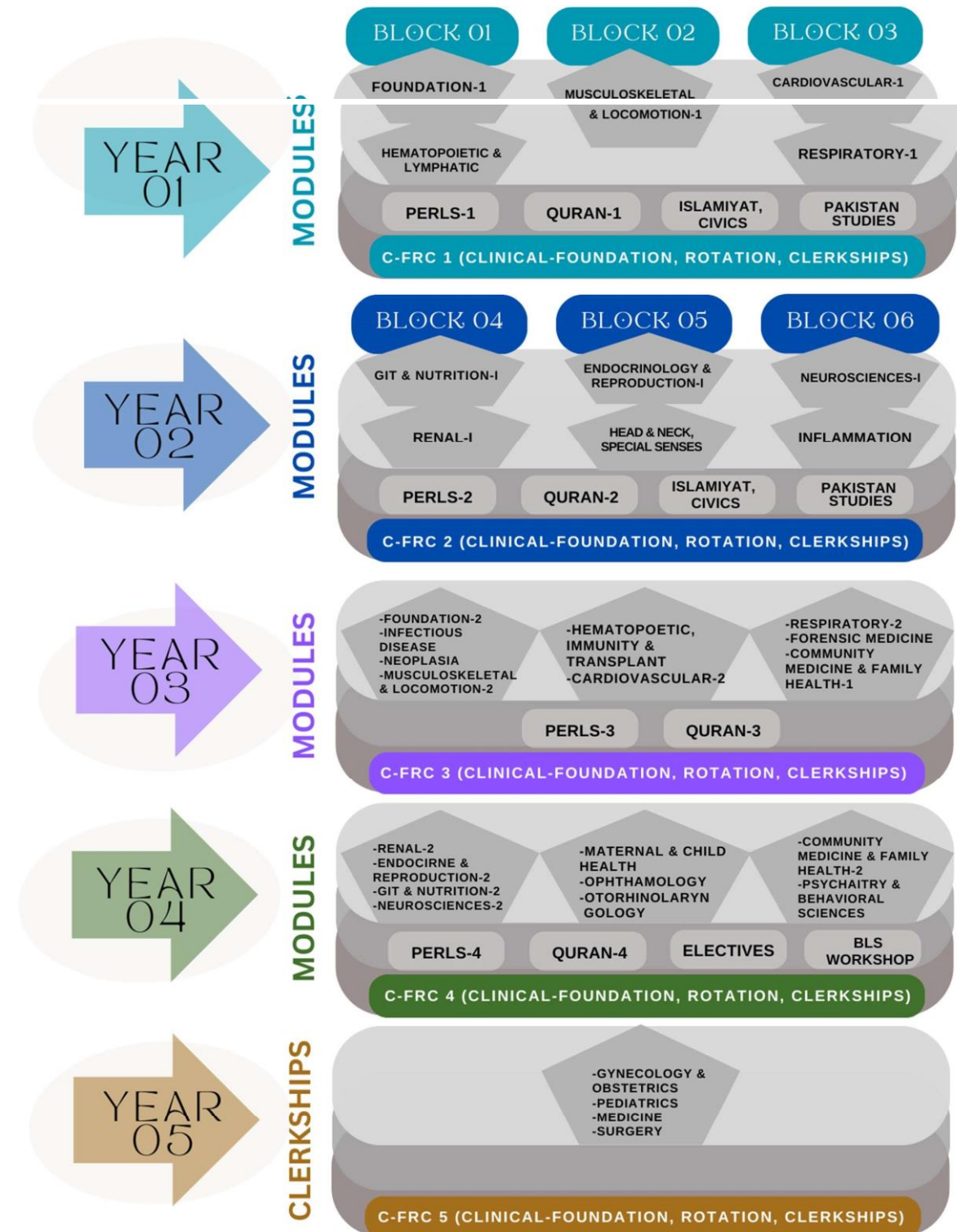
As you progress through your first year of medical school, refer to this study guide as a valuable companion on your academic journey. Embrace the opportunity to immerse yourself in the study of medicine, cultivate a lifelong passion for learning, and embrace the responsibilities of professionalism and patient-centered care.

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# Curriculum Framework

## Curriculum 2K23 *version 2.0*

### CURRICULUM FRAMEWORK



# Modular Committee

| Foundation Module Calendar      | Faculty Members                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cardiovascular Module Committee | <ul style="list-style-type: none"> <li>• Prof. Mohsin Gillani, Head Dept of Surgery</li> <li>• Prof. Taj Jamshaid, Dept of Medicine</li> <li>• Prof. Maria Aslam, Head Dept of Pathology</li> <li>• Dr. Waqas Iqbal Associate Professor Dept of Anatomy</li> <li>• Dr. Rafia Irum, Associate Professor Dept of Radiology</li> <li>• Dr. Nausheen Iftikhar, Associate Professor Dept of Peadritics</li> <li>• Dr. Fauzia Perveen, Associate Professor Dept of Pharmacology</li> <li>• Dr. Madiha Ehsan, Associate Professor Dept of Pathology</li> <li>• Dr. Amna Iqbal, Associate Professor Dept of Community Medicine</li> <li>• Dr. Sana Javaid, Assistant Professor Dept of Physiology</li> <li>• Dr. Anum Rehman, Assistant Professor Dept of Biochemistry</li> <li>• Miss. Kanwal Iqbal, Department of Psychiatry</li> </ul>          |
| Respiratory Module Committee    | <ul style="list-style-type: none"> <li>• Prof. Mohsin Gillani, Head Dept of Surgery</li> <li>• Prof. Taj Jamshaid, Dept of Medicine</li> <li>• Prof. Farooq Azam, Head Dept of Orthopeadic</li> <li>• Prof. Maria Aslam, Head Dept of Pathology</li> <li>• Prof. Sarmad Saif, Head Dept of Anesthesia</li> <li>• Prof. Samra Hafeez, Dept of Biochemistry</li> <li>• Prof. Sana Qanber, Dept of Physiology</li> <li>• Dr. Ammara Ghafoor, Associate Professor Dept of Anatomy</li> <li>• Dr. Farah Hanif, Associate Professor Head Dept of Forensic</li> <li>• Dr. Nausheen Iftikhar, Associate Professor Dept of Peadritics</li> <li>• Dr. Fauzia Parveen, Associate Professor Dept of Pharmacology</li> <li>• Dr. Madiha Ehsan, Associate Professor Dept of Pathology</li> <li>• Miss. Kanwal Iqbal, Department of Psychiatry</li> </ul> |
| PBL Committee                   | <ul style="list-style-type: none"> <li>• Prof. Taj Jamshaid, Dept of Medicine</li> <li>• Prof. Fouzia Butt, Dept of Gynae</li> <li>• Prof. Maria Aslam, Head Dept of Pathology</li> <li>• Prof. Ghazal Mansoor, Head Dept of Physiology</li> <li>• Dr Uzma Shahid, Head Dept of Medical Education</li> <li>• Dr. Ammara Ghafoor, Associate Professor Dept of Anatomy</li> <li>• Dr. Fauzia Parveen, Associate Professor Dept of Pharmacology</li> <li>• Dr. Amna Iqbal, Associate Professor Dept of Community Medicines</li> <li>• Dr. Nausheen Iftikhar, Associate Professor Dept of Peadritics</li> <li>• Dr. Anum Rehman, Assistant Professor Dept of Biochemistry</li> <li>• Dr. Hassan Taqi, Senior Registrar Dept of Surgery</li> <li>• Miss. Kanwal Iqbal, Department of Psychiatry</li> </ul>                                      |

# Faculty

| NAME                                 | DEPARTMENT   | DESIGNATION         | E-MAIL                                                                         |
|--------------------------------------|--------------|---------------------|--------------------------------------------------------------------------------|
| ANATOMY                              |              |                     |                                                                                |
| Prof. Nausheen Raza                  | Anatomy      | Professor           | <a href="mailto:nausheen410@gmail.com">nausheen410@gmail.com</a>               |
| Dr. Ammara Ghafoor                   | Anatomy      | Professor           | <a href="mailto:nabeeha.shahid1507@gmail.com">nabeeha.shahid1507@gmail.com</a> |
| Dr. Waqas Iqbal                      | Anatomy      | Associate Professor | <a href="mailto:drwaqasiqbal@gmail.com">drwaqasiqbal@gmail.com</a>             |
| Dr. Mamoon Shaukat                   | Anatomy      | Assistant Professor | <a href="mailto:monausman25@gmail.com">monausman25@gmail.com</a>               |
| Dr. Ittrat Umair                     | Anatomy      | Demonstrator        | <a href="mailto:ittratu@gmail.com">ittratu@gmail.com</a>                       |
| Dr. Ammarah Ejaz                     | Anatomy      | Demonstrator        | <a href="mailto:Ammarahejaz6@gmail.com">Ammarahejaz6@gmail.com</a>             |
| BIOCHEMISTRY                         |              |                     |                                                                                |
| Dr. Gul-e-Raana                      | Biochemistry | HOD & Professor     | <a href="mailto:guleraana60@gmail.com">guleraana60@gmail.com</a>               |
| Dr. Samra Hafeez                     | Biochemistry | Professor           | <a href="mailto:dr.samraisrar1993@gmail.com">dr.samraisrar1993@gmail.com</a>   |
| Dr. Hassan Jamil                     | Biochemistry | Associate Professor | <a href="mailto:biohassan86@gmail.com">biohassan86@gmail.com</a>               |
| Dr. Anam Rehman                      | Biochemistry | Demonstrator        | <a href="mailto:anamrana492@gmail.com">anamrana492@gmail.com</a>               |
| Dr. Haseeb Afzal                     | Biochemistry | Demonstrator        | <a href="mailto:haseebafzal1533@gmail.com">haseebafzal1533@gmail.com</a>       |
| Dr. Hadiqa Saeed                     | Biochemistry | Demonstrator        | <a href="mailto:Hadiqasaeed3@gmail.com">Hadiqasaeed3@gmail.com</a>             |
| PHYSIOLOGY                           |              |                     |                                                                                |
| Dr. Ghazal Mansoor                   | Physiology   | Professor           | <a href="mailto:ghazalmajeed100@gmail.com">ghazalmajeed100@gmail.com</a>       |
| Dr. Sana Qanber Abbasi               | Physiology   | Professor           | <a href="mailto:sanaqanberabbasi01@gmail.com">sanaqanberabbasi01@gmail.com</a> |
| Dr. Qurat-ul-ain                     | Physiology   | Associate Professor | <a href="mailto:quratkundi@gmail.com">quratkundi@gmail.com</a>                 |
| Dr. Sana Javaid                      | Physiology   | Assistant Professor | <a href="mailto:sana5120@hotmail.com">sana5120@hotmail.com</a>                 |
| Dr. Nazish Jamil                     | Physiology   | Assistant Professor | <a href="mailto:nazishjamil875@gmail.com">nazishjamil875@gmail.com</a>         |
| Dr. Wajih Malik                      | Physiology   | Demonstrator        | <a href="mailto:drwajihmalik@gmail.com">drwajihmalik@gmail.com</a>             |
| PATHOLOGY                            |              |                     |                                                                                |
| Prof. Maria Aslam                    | Pathology    | Professor & HOD     | <a href="mailto:mariaaslam77@outlook.com">mariaaslam77@outlook.com</a>         |
| Dr. Attia                            | Pathology    | Senior Demonstrator | <a href="mailto:atialateef@hotmail.com">atialateef@hotmail.com</a>             |
| PHARMACOLOGY AND THERAPEUTICS        |              |                     |                                                                                |
| Prof. Salman Bakhtiar                | Pharmacology | Prof & HOD          | <a href="mailto:salman_bakhtiar@hotmail.com">salman_bakhtiar@hotmail.com</a>   |
| Dr. Sabeen Arjumand                  | Pharmacology | Associate Prof      | <a href="mailto:sabeen_jabbar@hotmail.com">sabeen_jabbar@hotmail.com</a>       |
| COMMUNITY MEDICINE AND PUBLIC HEALTH |              |                     |                                                                                |

|                                                              |                              |                          |                                                                        |
|--------------------------------------------------------------|------------------------------|--------------------------|------------------------------------------------------------------------|
| Dr. Samina Khalid                                            | Community Medicine           | Associate Professor      | <a href="mailto:saminakhalid83@yahoo.com">saminakhalid83@yahoo.com</a> |
| Dr.Amna Iqbal Butt                                           | Community Medicine           | Assistant Professor      | <a href="mailto:dr_amnawaqas@hotmail.com">dr_amnawaqas@hotmail.com</a> |
| IMPACT (EPIDEMIOLOGY, SOCIOLOGY/SOCIETY, P heyUBLIC HEALTH)  |                              |                          |                                                                        |
| Dr.Ayaz M.Khan                                               | Behavioral Sciences          | Assisstant Professor     | <a href="mailto:dr.ayazmkhan@gmail.com">dr.ayazmkhan@gmail.com</a>     |
| Sarah Shirazi                                                | Behavioral Sciences          | Sr.Clinical Psychologist | <a href="mailto:shirazi1255@gmail.com">shirazi1255@gmail.com</a>       |
| PERLS (PROFESSIONALISM,ETHICS,RESEARCH,LEADERSHIP)           |                              |                          |                                                                        |
| Dr. Uzma Shahid                                              | Medical Education            | Head of Department       | <a href="mailto:uzma_shahid@yahoo.com">uzma_shahid@yahoo.com</a>       |
| HOLY QURAN AND ISLAMIYAT / CIVICS OTHER THAN MUSLIM STUDENTS |                              |                          |                                                                        |
| Ms. Oniba siddique                                           | Islamiyat/Civics/Pak Studies | Lecturerer               | <a href="mailto:onibasiddique@gmail.com">onibasiddique@gmail.com</a>   |

## **Rationale of Cardiovascular-I MODULE**

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

### **Module Outcomes**

- Describe the normal structure of heart including development, topographical anatomy, neurovascular supply, and histology.
  - Review the arrangement of circulatory system (arteries, veins, lymphatics).
  - Interpret pressure changes during cardiac cycle along with regulation of cardiac pumping.
  - Interpret normal & abnormal ECG, ST-T changes, and its abnormalities.
  - Identify the risk factors and role of lipids in coronary blockage and atherosclerosis (hyperlipidemia/ dyslipidemia).
  - Define cardiac output and its modulating/controlling factors.
  - Enumerate different types of arrhythmias and describe the electrical events that produce them.
-

# **CURRICULUM OF INDIVIDUAL SUBJECTS**

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# Human Anatomy

| CODE     | SPECIFIC LEARNING OUTCOMES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | TOTAL HOURS=10                      |             | MIT (Mode of information transfer)     |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------------|----------------------------------------|
|          | GROSS ANATOMY<br>UPPER LIMB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | DISCIPLINE                          | TOPIC       |                                        |
| CV-A-001 | <ul style="list-style-type: none"> <li>Define mediastinum giving its boundaries and compartments. List the contents of its various compartments.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Human Anatomy                       | Mediastinum | SGD (Small Group Discussion)           |
|          | <ul style="list-style-type: none"> <li>Describe the formation, tributaries, and termination of superior vena cava.</li> <li>Describe the formation, branches, and relations of ascending aorta, aortic arch and descending thoracic aorta.</li> <li>Discuss the distribution of ascending aorta, aortic arch and descending thoracic aorta in reference to their branches.</li> <li>Describe formation, course, and tributaries of azygous, hemizygous, and accessory hemizygous veins.</li> <li>Describe the course, relations, and distribution of vagus and thoracic splanchnic nerves in relation to nerve supply of heart.</li> </ul> | Human Anatomy                       |             | SGD (Small Group Discussion)           |
| CV-A-002 | <ul style="list-style-type: none"> <li>Describe Pericardium and its parts with emphasis on their neurovascular supply and lymphatic drainage.</li> <li>Describe the pericardial cavity mentioning transverse and oblique sinuses. Discuss their clinical significance</li> </ul>                                                                                                                                                                                                                                                                                                                                                           | Integrate with Surgery              | Pericardium | LGIS (Large group interactive session) |
|          | <ul style="list-style-type: none"> <li>Describe the anatomical correlates of pericardial rub, pericardial pain, pericarditis, pericardial effusion, and cardiac tamponade.</li> <li>Describe the anatomical basis for pericardiocentesis.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                       | Integrate with Medicine             |             | LGIS (Large group interactive session) |
| CV-A-003 | <ul style="list-style-type: none"> <li>Describe the external features of the heart.</li> <li>List various chambers of heart mentioning their salient features and openings.</li> <li>Describe the arterial supply of heart: coronary arteries and their distribution with special emphasis on collaterals established during ischemia.</li> <li>Describe the sites of anastomosis between right and left coronary arteries with the participating vessels.</li> </ul>                                                                                                                                                                      | Human Anatomy                       | Heart       | SGD (Small Group Discussion)           |
|          | <ul style="list-style-type: none"> <li>Discuss the anatomical correlates of cardiac arterial supply.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Integrate with cardiology/ Medicine |             | LGIS (Large group interactive session) |

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                     |                                                          |                                        |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|----------------------------------------------------------|----------------------------------------|
|             | <ul style="list-style-type: none"> <li>Describe the anatomical correlates of electrocardiography, cardiac referred pain</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Integrate with Cardiology/ Medicine | Heart                                                    | LGIS (Large group interactive session) |
|             | <ul style="list-style-type: none"> <li>Describe the anatomical basis for angioplasty, and coronary grafts</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Integrate with Cardiology/ Medicine |                                                          | LGIS (Large group interactive session) |
|             | <ul style="list-style-type: none"> <li>Describe the features of angina pectoris and myocardial infarction and correlate them anatomically</li> <li>Describe the venous drainage of the heart.</li> <li>Describe the alternative venous routes to the heart.</li> <li>Identify the vessels supplying the heart with their origins/terminations.</li> <li>Describe the Lymphatics of the heart.</li> <li>Describe the formation, relations, and distribution of cardiac plexus.</li> <li>Describe components and significance of fibrous skeleton of heart.</li> <li>Describe the cardiac valves</li> </ul> | Human Anatomy                       |                                                          | SGD (Small Group Discussion)           |
|             | <ul style="list-style-type: none"> <li>Explain the anatomical basis for valvular heart diseases</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Integrate with Cardiology/ Medicine |                                                          | LGIS (Large group interactive session) |
|             | <ul style="list-style-type: none"> <li>Perform surface marking of various anatomical landmarks of heart and great vessels</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Human Anatomy                       |                                                          | SGD (Small Group Discussion)           |
|             | <ul style="list-style-type: none"> <li>Perform percussion and auscultation of heart</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Integrate with Medicine             |                                                          | LGIS (Large group interactive session) |
|             | <ul style="list-style-type: none"> <li>Identify the salient features of heart and great vessels on CT/ MRI</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Integrate with Radiology            |                                                          | LGIS (Large group interactive session) |
|             | <b>EMBRYOLOGY &amp; POST-NATAL DEVELOPMENT</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                     | <b>TOTAL HOURS = 14</b>                                  |                                        |
| <b>CODE</b> | <b>SPECIFIC LEARNING OBJECTIVES</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>DESCIPLINE</b>                   | <b>TOPIC</b>                                             | <b>MIT (Mode of Information)</b>       |
| CV-A- 004   | <ul style="list-style-type: none"> <li>Describe the early development of heart and blood vessels</li> <li>Describe the development of pericardial cavity</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                       | Human Embryology                    | Introduction                                             | LGIS (Large group interactive session) |
| CV-A- 005   | <ul style="list-style-type: none"> <li>Define parts of primitive heart tube and give its folding.</li> <li>Describe the development of various chambers of the heart with emphasis on their partitioning.</li> <li>Identify various parts of developing heart tube and structures derived from them during embryonic and fetal life (Models and specimens)</li> </ul>                                                                                                                                                                                                                                     | Human Embryology                    | Development of Heart                                     | LGIS (Large group interactive session) |
| CV-A-006    | <ul style="list-style-type: none"> <li>Describe the embryological basis of dextrocardia and ectopia cordis.</li> <li>Describe the partitioning of primordial heart: atrioventricular canal and atrium.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                         | Human Embryology                    | Development of Heart and Development of Lymphatic System | LGIS (Large group interactive session) |

|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                     |                             |                                        |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-----------------------------|----------------------------------------|
|           | <ul style="list-style-type: none"> <li>Describe the development of sinus venosus</li> </ul>                                                                                                                                                                                                                                                                                                                                                              |                                     |                             |                                        |
|           | <ul style="list-style-type: none"> <li>List clinically significant types of atrial septal defects along with their embryological basis and features. Describe probe patent foramen ovale</li> </ul>                                                                                                                                                                                                                                                      | Integrate with Pediatrics           |                             | LGIS (Large group interactive session) |
|           | <ul style="list-style-type: none"> <li>Describe the partitioning of truncus arteriosus and bulbus cordis.</li> <li>Describe the formation of ventricles and interventricular septum</li> </ul>                                                                                                                                                                                                                                                           | Human Embryology                    |                             | LGIS (Large group interactive session) |
|           | <ul style="list-style-type: none"> <li>Describe the clinical features and embryological basis of ventricular septal defects</li> </ul>                                                                                                                                                                                                                                                                                                                   | Integrate with Pediatrics           |                             | LGIS (Large group interactive session) |
|           | <ul style="list-style-type: none"> <li>Describe the development of cardiac valves and conducting system.</li> </ul>                                                                                                                                                                                                                                                                                                                                      | Human Embryology                    |                             | LGIS (Large group interactive session) |
|           | <ul style="list-style-type: none"> <li>Describe the development of lymphatic system</li> </ul>                                                                                                                                                                                                                                                                                                                                                           | Human Embryology                    |                             | LGIS (Large group interactive session) |
| CV-A- 007 | <ul style="list-style-type: none"> <li>Describe the embryological correlates and clinical presentation of developmental defects of heart: Tetralogy of Fallot, Patent ductus arteriosus, Unequal division of arterial trunks, Transposition of great vessels and Valvular stenosis, Coarctation of aorta</li> </ul>                                                                                                                                      | Integrate with Pediatrics           | Development of Arteries     | LGIS (Large group interactive session) |
|           | <ul style="list-style-type: none"> <li>Describe the formation and fate of pharyngeal arch arteries</li> </ul>                                                                                                                                                                                                                                                                                                                                            | Human Embryology                    |                             | LGIS (Large group interactive session) |
|           | <ul style="list-style-type: none"> <li>Describe the anomalies of great arteries emerging from heart: Coarctation of aorta, anomalous arteries</li> </ul>                                                                                                                                                                                                                                                                                                 | Integrate with Cardiology/ Medicine |                             | LGIS (Large group interactive session) |
| CV-A- 008 | <ul style="list-style-type: none"> <li>Describe the development of embryonic veins associated with developing heart: Vitelline veins, Umbilical Veins and Common cardinal veins and their fate.</li> <li>Describe the formation of superior &amp; inferior vena cava and portal vein with their congenital anomalies.</li> <li>With the help of diagrams illustrate the development of superior vena cava, inferior vena cava and portal vein</li> </ul> | Human Embryology                    | Development of Veins        | LGIS (Large group interactive session) |
| CV-A- 009 | <ul style="list-style-type: none"> <li>List the derivatives of fetal vessels and structures: Umbilical vein, ductus venosus, umbilical artery, foramen ovale, ductus arteriosus</li> </ul>                                                                                                                                                                                                                                                               | Human Embryology                    | Fetal Vessels & Circulation | LGIS (Large group interactive session) |
|           | <ul style="list-style-type: none"> <li>Describe Fetal and neonatal circulation mentioning transitional neonatal circulation with its clinical implication</li> </ul>                                                                                                                                                                                                                                                                                     | Integrate with Pediatrics/ Obgyn    |                             | LGIS (Large group interactive session) |
| CV-A- 010 | <ul style="list-style-type: none"> <li>List clinically significant types of atrial septal defects along with their embryological basis and features. Describe patent foramen ovale.</li> </ul>                                                                                                                                                                                                                                                           | Pediatrics                          | Congenital Heart defects    | LGIS (Large group interactive session) |
|           | <ul style="list-style-type: none"> <li>Describe the embryological correlates and clinical presentation of developmental defects of heart: Tetralogy of Fallot,</li> </ul>                                                                                                                                                                                                                                                                                |                                     |                             | LGIS (Large group interactive session) |

|                                                        | Persistent ductus arteriosus, Unequal division of arterial trunks, Transposition of great vessels and Valvular stenosis                                                                                                                                                                                                                                                     |                          |                                               |                                        |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-----------------------------------------------|----------------------------------------|
| CODE                                                   | SPECIFIC LEARNING OBJECTIVES                                                                                                                                                                                                                                                                                                                                                | DISCIPLINE               | TOPIC                                         | MIT (Mode of information)              |
| <b>MICROSCOPIC ANATOMY (HISTOLOGY &amp; PATHOLOGY)</b> |                                                                                                                                                                                                                                                                                                                                                                             |                          | <b>Total Hours = 04</b>                       |                                        |
| CV-A- 011                                              | <ul style="list-style-type: none"> <li>Describe the microscopic structure of Heart wall (Endocardium, Myocardium, Epicardium)</li> <li>Describe cardiac skeleton, SA node, AV node, Purkinje fibers.</li> <li>Describe the microscopic and ultrastructural structure of cardiac muscle emphasizing on T-tubules, sarcoplasmic reticulum, and intercalated discs.</li> </ul> | Histology                | Heart & Cardiac Muscle                        | LGIS (Large group interactive session) |
|                                                        | <ul style="list-style-type: none"> <li>Identify, draw, and label histological structure of cardiac muscle</li> </ul>                                                                                                                                                                                                                                                        |                          |                                               | LGIS (Large group interactive session) |
| CV-A- 012                                              | <ul style="list-style-type: none"> <li>Describe general histological organization of blood vessels: Tunica intima, media, and adventitia.</li> </ul>                                                                                                                                                                                                                        | Histology                | Blood Vessels Organization                    | LGIS (Large group interactive session) |
|                                                        | <ul style="list-style-type: none"> <li>Identify, draw, and label histological sections of elastic artery, muscular artery, arterioles, vein, capillaries, and sinusoids</li> </ul>                                                                                                                                                                                          |                          |                                               | LGIS (Large group interactive session) |
| CV-A- 013                                              | <ul style="list-style-type: none"> <li>Describe histological features of arteries: Muscular arteries, elastic arteries, Arterioles</li> </ul>                                                                                                                                                                                                                               | Histology                | Arteries                                      | LGIS (Large group interactive session) |
| CV-A- 014                                              | <ul style="list-style-type: none"> <li>Describe histological features of veins and exchange vessels: large veins, medium sized veins, venules, Capillaries, and sinusoids</li> </ul>                                                                                                                                                                                        | Histology                | Veins                                         | LGIS (Large group interactive session) |
|                                                        | <ul style="list-style-type: none"> <li>Compare and contrast the light microscopic structure of arteries and veins</li> </ul>                                                                                                                                                                                                                                                |                          |                                               | LGIS (Large group interactive session) |
| CV-A- 015                                              | <ul style="list-style-type: none"> <li>Describe the histopathological basis of thrombus and embolus formation.</li> </ul>                                                                                                                                                                                                                                                   | Integrate with Pathology | Thrombus/ Embolus formation                   | LGIS (Large group interactive session) |
| CV-A- 016                                              | <ul style="list-style-type: none"> <li>Explain the histological basis of arteriosclerosis and atherosclerosis</li> <li>Describe role of arterioles in hypertension</li> </ul>                                                                                                                                                                                               | Histology                | Arteriosclerosis atherosclerosis Hypertension | LGIS (Large group interactive session) |
| CV-A- 017                                              | <ul style="list-style-type: none"> <li>Describe histological features of Lymph vascular system (Lymph capillaries, Lymph vessels &amp; Lymphatic Duct)</li> </ul>                                                                                                                                                                                                           | Histology                | Lymph vascular System                         | LGIS (Large group interactive session) |

| CODE     | SPECIFIC LEARNING OUTCOMES                                                                                                                                                       | TOTAL HOURS = 03 |                                         | MIT (Mode of information transfer) |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-----------------------------------------|------------------------------------|
|          |                                                                                                                                                                                  | DISCIPLINE       | TOPIC                                   |                                    |
| CV-A-018 | <ul style="list-style-type: none"> <li>Identify, Draw and Label histological structure of cardiac muscles.</li> </ul>                                                            | Histology        | Histological features of Cardiac Muscle | Laboratory Practical               |
| CV-A-019 | <ul style="list-style-type: none"> <li>Identify, draw and label histological sections of elastic artery, muscular artery, arterioles, vein, capillaries and sinusoids</li> </ul> | Histology        | Histological features of Blood vessels  | Laboratory Practical               |

# Medical Physiology

| CODE      | SPECIFIC LEARNING OUTCOMES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TOTAL HOURS=34                      |                             | MIT (Mode of information transfer)                                         |
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|           | NORMAL ORGAN FUNCTIONS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | DISCIPLINE                          | TOPIC                       |                                                                            |
| MS-P-001  | <ul style="list-style-type: none"> <li>Explain the physiological anatomy of cardiac muscle.</li> <li>Explain the functional importance of intercalated discs.</li> <li>Discuss the properties of cardiac muscles.</li> <li>Describe and draw the phases of action potential of ventricle.</li> <li>Describe and draw the phases of action potential of SA node along with explanation of the mechanism of self-excitation/ Auto rhythmicity of SA node.</li> <li>Define and give the duration of the Absolute and relative refractory period in cardiac muscle.</li> <li>Draw &amp; explain pressure &amp; volume changes of left ventricle during cardiac cycle.</li> <li>Explain &amp; draw relationship of ECG with cardiac cycle.</li> <li>Explain &amp; draw the relationship of heart sounds with cardiac cycle.</li> <li>Enlist, draw, and explain the physiological basis of atrial pressure waves in relation to cardiac cycle.</li> </ul> | Medical Physiology                  | Cardiac Muscle              | LGIS (Large group interactive session)<br><br>SGD (Small group discussion) |
|           | <ul style="list-style-type: none"> <li>Define &amp; give the normal values of the cardiac output, stroke volume, end diastolic volume &amp; end systolic volume</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Integrate with Medicine             |                             | LGIS (Large group interactive session)                                     |
| CV-P- 002 | <ul style="list-style-type: none"> <li>Describe the Frank Starling mechanism.</li> <li>Describe the autonomic regulation of heart pumping.</li> <li>Describe the effect of potassium, calcium ions &amp; temperature on heart function.</li> <li>Define chronotropic effect- positive and negative.</li> <li>Define the inotropic effect: positive and negative.</li> <li>Define dromotropic effect: positive and negative.</li> <li>Describe the location of adrenergic &amp; cholinergic receptors in the heart.</li> <li>Name the receptors present in coronary arterioles.</li> <li>Explain sympathetic &amp; parasympathetic effects on heart rate &amp; conduction velocity</li> </ul>                                                                                                                                                                                                                                                        | Medical Physiology                  | Regulation of heart pumping | LGIS (Large group interactive session)                                     |
| CV-P- 003 | <ul style="list-style-type: none"> <li>Draw and explain the conducting system of heart.</li> <li>Describe the physiological basis and</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Integrate with Cardiology/ Medicine | Conducting system of heart  | LGIS (Large group interactive session)                                     |

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|           | significance of AV nodal delay.                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                     |                              |                                                                        |
| CV-P- 004 | <ul style="list-style-type: none"> <li>Enlist, draw, and explain the physiological basis &amp; give durations of waves, intervals, and segments of normal ECG.</li> <li>Describe the standard limb leads, Augmented limb leads &amp; precordial leads.</li> <li>Explain the physiological basis of upright T wave in normal ECG.</li> <li>Describe the location and significance of J point in ECG.</li> <li>Explain the physiological basis of current of injury.</li> </ul> | Medical Physiology                  | Fundamentals of ECG          | LGIS (Large group interactive session)                                 |
|           | <ul style="list-style-type: none"> <li>Enlist the ECG changes in angina pectoris.</li> <li>Enlist the ECG changes in myocardial infarction.</li> </ul>                                                                                                                                                                                                                                                                                                                        | Integrate with Medicine             |                              | LGIS (Large group interactive session)<br>SGD (Small group discussion) |
|           | <ul style="list-style-type: none"> <li>Plot the mean cardiac axis.</li> <li>Enlist the physiological &amp; pathological causes of right axis deviation of heart.</li> <li>Enlist the physiological &amp; pathological causes of left axis deviation of heart</li> </ul>                                                                                                                                                                                                       | Medical Physiology                  |                              | LGIS (Large group interactive session)                                 |
|           | <ul style="list-style-type: none"> <li>Describe the abnormalities of T wave and their causes.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                      | Integrate with Medicine             |                              | LGIS (Large group interactive session)                                 |
| CV-P- 005 | <ul style="list-style-type: none"> <li>Describe the effect of hypokalemia and hyperkalemia on ECG.</li> <li>Describe the effect of hypocalcemia and hypercalcemia on ECG.</li> </ul>                                                                                                                                                                                                                                                                                          | Integrate with Biochemistry         | Effect of electrolyte on ECG | LGIS (Large group interactive session)                                 |
| CV-P- 006 | <ul style="list-style-type: none"> <li>Define tachycardia and enlist its causes.</li> <li>Define bradycardia and enlist its causes.</li> </ul>                                                                                                                                                                                                                                                                                                                                | Integrate with Medicine             | Cardiac arrhythmia           | LGIS (Large group interactive session)                                 |
|           | <ul style="list-style-type: none"> <li>Classify arrhythmias.</li> <li>Explain the physiological basis of sinus arrhythmia.</li> <li>Explain the physiological basis of reflex bradycardia in Athletes.</li> <li>Explain the carotid sinus syndrome.</li> </ul>                                                                                                                                                                                                                | Medical Physiology                  |                              | LGIS (Large group interactive session)                                 |
|           | <ul style="list-style-type: none"> <li>Enlist the causes of atrioventricular block.</li> <li>Explain the types of atrioventricular blocks.</li> <li>Explain the ECG changes in 1st, 2nd &amp; 3rd degree heart block.</li> </ul>                                                                                                                                                                                                                                              | Integrate with Cardiology/ Medicine |                              | LGIS (Large group interactive session)<br>PBL (Problem Based Learning) |
|           | <ul style="list-style-type: none"> <li>Explain the cause, physiological basis &amp; ECG changes in Stokes Adam syndrome/ventricular escape.</li> </ul>                                                                                                                                                                                                                                                                                                                        | Medical Physiology                  |                              | LGIS (Large group interactive session)<br>PBL (Problem Based Learning) |

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|           | <ul style="list-style-type: none"> <li>Enlist the causes of premature contractions.</li> <li>Explain the causes and ECG changes of premature atrial contractions.</li> </ul>                                                                                                                                                                                                                                                                                             | Integrate with Cardiology/ Medicine |                                       | LGIS (Large group interactive session)                                 |
|           | <ul style="list-style-type: none"> <li>Explain the physiological basis of pulses deficit.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                     | Medical Physiology                  |                                       | LGIS (Large group interactive session)                                 |
|           | <ul style="list-style-type: none"> <li>Explain the causes and ECG changes in PVC.</li> <li>Enlist the causes and ECG findings in Long QT syndrome.</li> <li>Explain the causes, physiological basis, features, ECG changes &amp; management of ventricular fibrillation.</li> <li>Explain the causes, physiological basis, features &amp; ECG changes of atrial fibrillation.</li> </ul>                                                                                 | Integrate with Cardiology/ Medicine |                                       | LGIS (Large group interactive session)                                 |
|           | <ul style="list-style-type: none"> <li>Explain the physiological basis, features &amp; ECG changes of atrial flutter.</li> <li>Compare Flutter and Fibrillations</li> </ul>                                                                                                                                                                                                                                                                                              | Medical Physiology                  |                                       | LGIS (Large group interactive session)                                 |
| CV-P-007  | <ul style="list-style-type: none"> <li>Explain the functional parts of circulation (arteries, arterioles, capillaries, veins, venules).</li> </ul>                                                                                                                                                                                                                                                                                                                       | Medical Physiology                  | Organization of Circulation           | LGIS (Large group interactive session)                                 |
| CV-P-008  | <ul style="list-style-type: none"> <li>Explain the pressures in systemic &amp; pulmonary circulation.</li> <li>Explain the types of Blood flow and significance of Reynolds number.</li> </ul>                                                                                                                                                                                                                                                                           | Medical Physiology                  | Blood flow                            | LGIS (Large group interactive session)                                 |
| CV-P- 009 | <ul style="list-style-type: none"> <li>Discuss acute local control of local blood flow.</li> <li>Discuss acute humoral control of local blood flow.</li> <li>Explain long term control of local blood flow.</li> <li>Name the organs in which auto regulation of blood flow occurs during changes in arterial pressure (metabolic &amp; myogenic mechanisms).</li> </ul>                                                                                                 | Medical Physiology                  | Local & Humoral Control of Blood flow | LGIS (Large group interactive session)                                 |
| CV-P- 010 | <ul style="list-style-type: none"> <li>Explain the role of autonomic nervous system for regulating the circulation.</li> <li>Explain the vasomotor center.</li> <li>Explain the control of vasomotor center by higher nervous centers.</li> <li>Explain emotional fainting/vasovagal syncope.</li> <li>Identify vessels constituting micro-capillaries. Enumerate hydrostatic and osmotic factors that underline Starling's Hypothesis for capillary function</li> </ul> | Medical Physiology                  | Nervous Regulation of circulation     | LGIS (Large group interactive session)                                 |
| CV-P- 011 | <ul style="list-style-type: none"> <li>Explain the role of the nervous system in rapid control of arterial blood pressure.</li> <li>Explain the regulation of arterial blood pressure during exercise.</li> <li>Enlist different mechanisms for short term regulation of arterial blood pressure.</li> </ul>                                                                                                                                                             |                                     |                                       | LGIS (Large group interactive session)<br>SGD (Small group discussion) |

|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                     |                                                                    |                                                                        |
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|           | <ul style="list-style-type: none"> <li>Explain the role of baroreceptors in regulation of arterial blood pressure.</li> <li>Explain the role of chemoreceptors in regulation of arterial blood pressure.</li> <li>Make a flow chart to discuss the role of Atrial volume reflexes/ Bainbridge reflex in control of blood pressure.</li> <li>Make a flow chart to show the reflex responses to increased blood volume which increase blood pressure and atrial stretch.</li> <li>Describe the role of CNS ischemic response in regulation of blood pressure.</li> <li>Explain the Cushing reflex.</li> <li>Explain the role of abdominal compression reflex to increase the arterial blood pressure.</li> </ul> | Medical Physiology                  | Rapid control of arterial blood pressure                           |                                                                        |
| CV-P- 012 | <ul style="list-style-type: none"> <li>Make a flow chart to discuss the role of renin angiotensin system for long term control of blood pressure.</li> <li>Make a flow chart to show the regulation of blood pressure in response to increase in ECF volume.</li> <li>Make a flow chart to show the regulation of blood pressure in response to increase in salt intake.</li> </ul>                                                                                                                                                                                                                                                                                                                            | Medical Physiology                  | Role of kidneys in long term Regulation of Arterial Blood Pressure | LGIS (Large group interactive session)                                 |
| CV-P- 013 | <ul style="list-style-type: none"> <li>Define cardiac output, cardiac index &amp; venous return with their normal values.</li> <li>Explain the pathological causes of high &amp; low cardiac output.</li> <li>Discuss the factors regulating cardiac output.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                        | Integrate with Cardiology/ Medicine | Cardiac output                                                     | LGIS (Large group interactive session)                                 |
|           | <ul style="list-style-type: none"> <li>Discuss factors regulating venous return</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Medical Physiology                  |                                                                    | LGIS (Large group interactive session)<br>SGD (Small group discussion) |
| CV-P- 014 | <ul style="list-style-type: none"> <li>Explain the regulation of skeletal muscle blood flow at rest &amp; during exercise.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Medical Physiology                  | Skeletal muscle circulation                                        | LGIS (Large group interactive session)                                 |
| CV-P- 015 | <ul style="list-style-type: none"> <li>Explain the physiological anatomy of coronary circulation.</li> <li>Explain the regulation of coronary blood flow.</li> <li>Explain the physiological basis of angina, myocardial &amp; subendocardial infarction</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                            | Medical Physiology                  | Coronary circulation                                               | LGIS (Large group interactive session)                                 |
| CV-P- 016 | <ul style="list-style-type: none"> <li>Define &amp; enlist different types of shock.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Medical Physiology                  | Circulatory shock                                                  | LGIS (Large group interactive session)                                 |
|           | <ul style="list-style-type: none"> <li>Explain the causes, features, and pathophysiology of hypovolemic/hemorrhagic shock.</li> <li>Explain the causes, features, and pathophysiology of septic shock.</li> <li>Explain the causes, features, and</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Integrate with Pathology            |                                                                    | LGIS (Large group interactive session)                                 |

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|           | <ul style="list-style-type: none"> <li>pathophysiology of neurogenic shock.</li> <li>Explain the causes, features, and pathophysiology of anaphylactic shock.</li> </ul>                                                                                                                                                              |                                 |                                     |                                                                                                        |
|           | <ul style="list-style-type: none"> <li>Discuss the treatment of different types of shock.</li> </ul>                                                                                                                                                                                                                                  | Integrate with Medicine         |                                     | LGIS (Large group interactive session)                                                                 |
| CV-P- 017 | <ul style="list-style-type: none"> <li>Explain the different stages of shock.</li> <li>Explain the mechanisms that maintain the cardiac output &amp; arterial blood pressure in non-progressive shock.</li> <li>Enlist different types of positive feedback</li> <li>mechanisms that can lead to the progression of shock.</li> </ul> | Medical Physiology              | Heart Sounds                        | LGIS (Large group interactive session)<br>SGD (Small group discussion)<br>PBL (Problem Based Learning) |
|           | <ul style="list-style-type: none"> <li>Enlist the different types of heart sounds and explain the physiological basis of each.</li> <li>Enlist the causes of 3rd and 4th heart sounds.</li> <li>Explain the causes &amp; physiological basis of murmurs caused by valvular lesions.</li> </ul>                                        | Integrate with Medicine         |                                     | LGIS (Large group interactive session)                                                                 |
| CV-P- 018 | <ul style="list-style-type: none"> <li>Classify different types of heart failure.</li> <li>Discuss the signs and symptoms of Heart failure.</li> <li>Discuss the management of Heart failure.</li> </ul>                                                                                                                              | General Medicine/<br>Cardiology | Heart Failure                       | LGIS (Large group interactive session)                                                                 |
| CV-P-019  | <ul style="list-style-type: none"> <li>Discuss the signs and symptoms of: Arrhythmias.</li> <li>Discuss the management of Arrhythmias.</li> </ul>                                                                                                                                                                                     |                                 | Arrhythmias                         | LGIS (Large group interactive session)                                                                 |
| CV-P- 020 | <ul style="list-style-type: none"> <li>Enlist various categories of ischemic heart diseases.</li> <li>Discuss the signs and symptoms of ischemic heart diseases.</li> <li>Discuss the management of ischemic heart diseases.</li> </ul>                                                                                               |                                 | Ischemic Heart Disease (IHD)        | LGIS (Large group interactive session)                                                                 |
| CV-P-021  | <ul style="list-style-type: none"> <li>Discuss the signs and symptoms of: Hypertension.</li> <li>Discuss the management of Hypertension.</li> </ul>                                                                                                                                                                                   |                                 | Hypertension                        | LGIS (Large group interactive session)                                                                 |
| CV-P- 022 | <ul style="list-style-type: none"> <li>Enlist various valvular heart diseases.</li> <li>Identify presentations and signs and symptoms of valvular heart diseases.</li> <li>Outline management strategies</li> </ul>                                                                                                                   |                                 | Valvular Heart Diseases             | LGIS (Large group interactive session)                                                                 |
| CV-P- 023 | <ul style="list-style-type: none"> <li>Identify various pericardial diseases.</li> <li>Identify presentations and signs and symptoms.</li> <li>Outline management strategies</li> </ul>                                                                                                                                               | General Medicine/<br>Cardiology | Pericardial Diseases                | LGIS (Large group interactive session)                                                                 |
| CV-P- 024 | <ul style="list-style-type: none"> <li>Identify various endocardial and myocardial diseases.</li> <li>Identify presentations and signs and symptoms.</li> <li>Outline management strategies</li> </ul>                                                                                                                                | General Medicine/<br>Cardiology | Endocardial and myocardial diseases | LGIS (Large group interactive session)                                                                 |
| CV-P- 025 | <ul style="list-style-type: none"> <li>Define Peripheral arterial diseases.</li> <li>Identify symptoms and signs of PAD.</li> <li>Outline management strategies</li> </ul>                                                                                                                                                            | General Medicine                | Peripheral Arterial Diseases (PAD)  | LGIS (Large group interactive session)                                                                 |

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| CV-P- 026 | <ul style="list-style-type: none"> <li>Enlist various sites of venous thromboembolism.</li> <li>Identify various symptoms and signs of DVT.</li> <li>Identify various symptoms and signs of pulmonary embolism.</li> <li>Outline management strategies</li> </ul> | General Medicine, Surgery | Venous thrombo-embolism       | LGIS (Large group interactive session) |
| CV-P- 027 | <ul style="list-style-type: none"> <li>Identify the salient features of heart and great vessels on CT/ MRI</li> <li>Discuss the principles of cardiac catheterization</li> </ul>                                                                                  | Radiology                 | Imaging in CVS disorders      | LGIS (Large group interactive session) |
| CV-P- 028 | <ul style="list-style-type: none"> <li>Justify the clinical picture of superior mediastinum syndrome anatomically</li> </ul>                                                                                                                                      | Surgery                   | Superior mediastinum Syndrome | LGIS (Large group interactive session) |
| CV-P- 029 | <ul style="list-style-type: none"> <li>Describe Fetal and neonatal circulation mentioning transitional neonatal circulation with its clinical implication</li> </ul>                                                                                              | Pediatrics, Obgyn         | Fetal circulation at Birth    | LGIS (Large group interactive session) |
| CV-P-030  | <ul style="list-style-type: none"> <li>Psychological basis of emotional fainting and its impact</li> </ul>                                                                                                                                                        | Behavioral Sciences       | Emotional fainting            | LGIS (Large group interactive session) |

| CODE     | SPECIFIC LEARNING OUTCOMES                                                                                               | TOTAL HOURS=10     |                | MIT (Mode of information transfer) |
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|          | PHYSIOLOGY PRACTICALS                                                                                                    | DISCIPLINE         | TOPIC          |                                    |
| CV-P-031 | <ul style="list-style-type: none"> <li>Record an electrocardiogram by correct lead placement and connections.</li> </ul> | Medical Physiology | ECG            | Practical/Demonstrations           |
| CV-P-032 | <ul style="list-style-type: none"> <li>Perform auscultation of chest to recognize normal heart sounds.</li> </ul>        |                    | Heart Sounds   |                                    |
| CV-P-033 | <ul style="list-style-type: none"> <li>Examine neck veins to determine Jugular Venous Pulse.</li> </ul>                  |                    | JVP            |                                    |
| CV-P-034 | <ul style="list-style-type: none"> <li>Examine arterial pulse to recognize normal characteristics of pulse.</li> </ul>   |                    | Arterial Pulse |                                    |

## Medical Biochemistry

| CODE     | SPECIFIC LEARNING OUTCOMES                                                                                                                                                                                                                        | TOTAL HOURS=30       |                                            | MIT (Mode of information transfer)                                                              |
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|          | BIOCHEMISTRY                                                                                                                                                                                                                                      | DISCIPLINE           | TOPIC                                      |                                                                                                 |
| CV-B-001 | <ul style="list-style-type: none"> <li>Classify lipids.</li> </ul>                                                                                                                                                                                | Medical Biochemistry | Classification of lipids                   | LGIS (Large group interactive session) / Tutorials / SGD (Small Group Discussion)               |
| CV-B-002 | <ul style="list-style-type: none"> <li>Discuss the biomedical functions &amp; properties of lipids.</li> </ul>                                                                                                                                    | Medical Biochemistry | Functions of lipids & Properties of lipids | LGIS (Large group interactive session) / Tutorials / SGD (Small Group Discussion)/Presentations |
| CV-B-003 | <ul style="list-style-type: none"> <li>Classify fatty acids. Discuss the role of trans saturated, saturated, poly- and mono-unsaturated fatty acids in diet on lipid profile.</li> <li>Discuss lipid peroxidation and its significance</li> </ul> | Medical Biochemistry | Classification of fatty acids              | LGIS (Large group interactive session) / Tutorials / SGD (Small Group Discussion)/Presentations |
| CV-B-004 | <ul style="list-style-type: none"> <li>Explain the biochemical and therapeutic roles of eicosanoids (prostaglandins, leukotrienes, thromboxane, and prostacyclin)</li> </ul>                                                                      | Medical Biochemistry | Eicosanoids                                | LGIS (Large group interactive session) / Tutorials / SGD (Small Group Discussion)/Presentations |
| CV-B-005 | <ul style="list-style-type: none"> <li>Describe the types, structure, and biomedical importance of Lipoproteins.</li> <li>Discuss the synthesis, transport, and fate of Lipoproteins</li> </ul>                                                   | Medical Biochemistry | Circulation Lipoproteins                   | LGIS (Large group interactive session) / Tutorials / SGD (Small Group Discussion)/Presentations |
| CV-B-006 | <ul style="list-style-type: none"> <li>Interpret the disorders associated with impairment of lipoprotein metabolism especially atherosclerosis and LDL oxidized</li> </ul>                                                                        | Medical Biochemistry | Hyperlipidemias                            | LGIS (Large group interactive session) / Tutorials / SGD (Small Group Discussion)/Presentations |
| CV-B-007 | <ul style="list-style-type: none"> <li>Describe the reactions of cholesterol biosynthesis and its regulation &amp; fate.</li> <li>Discuss Genetic basis of the Hypercholesterolemia</li> </ul>                                                    | Medical Biochemistry | Cholesterol                                | LGIS (Large group interactive session) / Tutorials / SGD (Small Group Discussion)               |

|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                     |                             |                                                                                                 |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-----------------------------|-------------------------------------------------------------------------------------------------|
| CV-B- 008 | <ul style="list-style-type: none"> <li>Describe enzymes with reference to:               <ul style="list-style-type: none"> <li>Active sites</li> <li>Specificity</li> <li>Catalytic</li> <li>Cofactor efficiency</li> <li>Coenzyme</li> <li>Holoenzyme</li> <li>Apoenzyme</li> <li>Prosthetic group</li> <li>Zymogens</li> <li>Location</li> </ul> </li> </ul>                                                                                                                                                                                                                                                                               | Medical Biochemistry                | Hypercholesterolemia        | LGIS (Large group interactive session) / Tutorials / SGD (Small Group Discussion)/Presentations |
| CV-B- 009 | <ul style="list-style-type: none"> <li>Classify enzymes according to the reaction they catalyze.</li> <li>Explain the mechanism of enzyme action from reactants to products (catalysis).               <ul style="list-style-type: none"> <li>a) Illustrate enzyme kinetics in relation to MM Equation &amp; Lineweaver- Burke plot</li> </ul> </li> <li>Discuss the effect of various factors (with special reference to <math>K_m/V_{max}</math>) on enzymatic activity.               <ul style="list-style-type: none"> <li>Substrate concentration</li> <li>Temperature</li> <li>PH</li> <li>Enzyme concentration</li> </ul> </li> </ul> | Medical Biochemistry                | Enzymes                     | LGIS (Large group interactive session) / Tutorials / SGD (Small Group Discussion)               |
|           | <ul style="list-style-type: none"> <li>Explain the regulation of enzymatic activity. Compare allosteric regulation with regulation by covalent modification. Discuss the effect of inhibitors on enzymatic activity which includes:               <ul style="list-style-type: none"> <li>Competitive inhibition</li> <li>Uncompetitive inhibition</li> </ul> </li> <li>Interpret the effect of organophosphorus poisoning on enzyme activity on basis of given data</li> </ul>                                                                                                                                                                |                                     |                             | LGIS (Large group interactive session) / Tutorials / SGD (Small Group Discussion)/Presentations |
|           | <ul style="list-style-type: none"> <li>Explain the application of enzyme in clinical diagnosis and therapeutic use</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Integrate with Medicine/ Cardiology |                             | LGIS (Large group interactive session)                                                          |
| CV-B- 010 | <ul style="list-style-type: none"> <li>Discuss the signs and symptoms of hyperlipidemia.</li> <li>Interpret data related to hyperlipidemia</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Biochemistry / Medicine             | Type I to V hyperlipidemias | LGIS (Large group interactive session) / Tutorials / SGD (Small Group Discussion)/Presentations |

| CODE     | SPECIFIC LEARNING OUTCOMES                                                                                                                       | TOTAL HOURS=8        |                              | MIT (Mode of information transfer) |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|------------------------------|------------------------------------|
|          | BIOCHEMISTRY PRACTICALS                                                                                                                          | DISCIPLINE           | TOPIC                        |                                    |
| CV-B-011 | <ul style="list-style-type: none"> <li>Perform estimation of Cholesterol by kit method</li> </ul>                                                | Medical Biochemistry | Cholesterol Estimation       | Demonstration Performance          |
| CV-B-012 | <ul style="list-style-type: none"> <li>Perform estimation of HDL, LDL</li> </ul>                                                                 |                      | HDL, LDL Estimation          | Demonstration Performance          |
| CV-B-013 | <ul style="list-style-type: none"> <li>Estimation of cardiac markers</li> </ul>                                                                  |                      | Cardiac Marker Estimation    | Demonstration Performance          |
| CV-B-014 | <ul style="list-style-type: none"> <li>Interpret lab reports based on enzymes for diseases like cardiac disorders and hyperlipidemias</li> </ul> |                      | Interpretation of Lab report | Demonstration                      |

## Pathophysiology and Pharmacotherapeutics

| CODE       | SPECIFIC LEARNING OUTCOMES                                                                                                                                                                                                   | TOTAL HOURS=4+7= 11         |                                        | MIT (Mode of information transfer)     |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|----------------------------------------|----------------------------------------|
|            |                                                                                                                                                                                                                              | DISCIPLINE                  | TOPIC                                  |                                        |
| CV-Ph- 001 | <ul style="list-style-type: none"> <li>Outline the pharmacological concepts of drugs used in hypertension.</li> </ul>                                                                                                        | Pharmacology & Therapeutics | Antihypertensive drugs                 | LGIS (Large group interactive session) |
| CV-Ph- 002 | <ul style="list-style-type: none"> <li>Outline the pharmacological concepts of drugs used in angina.</li> </ul>                                                                                                              |                             | Antianginal drugs                      | LGIS (Large group interactive session) |
| CV-Ph- 003 | <ul style="list-style-type: none"> <li>Outline the pharmacological concepts of drugs used in arrhythmias.</li> </ul>                                                                                                         |                             | Antiarrhythmics drugs                  | LGIS (Large group interactive session) |
| CV-Ph- 004 | <ul style="list-style-type: none"> <li>Outline the pharmacological concepts of drugs used in cardiac failure.</li> </ul>                                                                                                     |                             | Drugs for cardiac failure              | LGIS (Large group interactive session) |
| CV-Ph- 005 | <ul style="list-style-type: none"> <li>Outline the pharmacological concepts of drugs used in peripheral vascular diseases.</li> </ul>                                                                                        |                             | Drugs for peripheral vascular diseases | LGIS (Large group interactive session) |
| CV-Pa- 001 | <ul style="list-style-type: none"> <li>Classify types of thrombosis, embolism, and infarction</li> </ul>                                                                                                                     | Pathology                   | Hemodynamics and CVS                   | LGIS (Large group interactive session) |
| CV-Pa- 002 | <ul style="list-style-type: none"> <li>Discuss the pathophysiology of thrombosis, embolism, and infarction</li> </ul>                                                                                                        |                             | Atherosclerosis                        | LGIS (Large group interactive session) |
| CV-Pa- 003 | <ul style="list-style-type: none"> <li>Identify the types and causes of hypertension</li> </ul>                                                                                                                              |                             | Hypertension                           | LGIS (Large group interactive session) |
| CV-Pa- 004 | <ul style="list-style-type: none"> <li>Discuss the pathophysiology of atherosclerosis, hypertension, and shock</li> </ul>                                                                                                    |                             | Shock                                  | LGIS (Large group interactive session) |
| CV-Pa- 005 | <ul style="list-style-type: none"> <li>Discuss the clinical consequences of hypertension and atherosclerosis.</li> <li>Classify the types of heart failure.</li> <li>Identify the causes leading to heart failure</li> </ul> |                             | Cardiac Failure                        | LGIS (Large group interactive session) |
| CV-Pa- 006 | <ul style="list-style-type: none"> <li>Identify the types of ischemic heart disease.</li> <li>Discuss the pathophysiology of different types of ischemic heart disease</li> </ul>                                            |                             | Ischemic Heart Disease                 | LGIS (Large group interactive session) |

## Disease Prevention and Impact

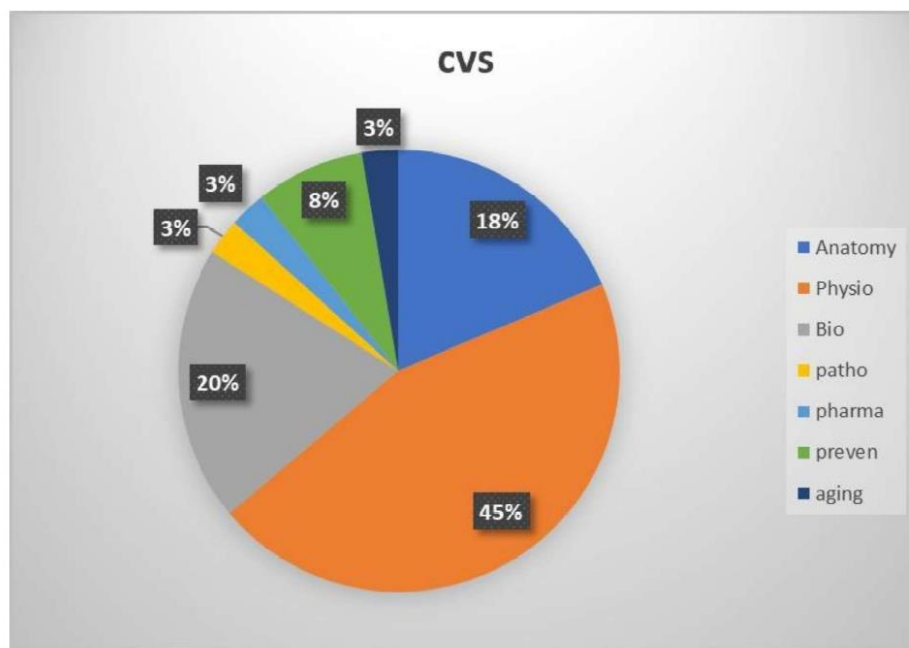
| CODE       | SPECIFIC LEARNING OUTCOMES                                                                                                                                                                                                                                                                 | TOTAL HOURS=15                       |                                               | MIT (Mode of information transfer)     |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-----------------------------------------------|----------------------------------------|
|            |                                                                                                                                                                                                                                                                                            | DISCIPLINE                           | TOPIC                                         |                                        |
| CV-CM-001  | <ul style="list-style-type: none"> <li>Describe the various strategies and models to prevent diseases.</li> </ul>                                                                                                                                                                          | Community Medicine and Public Health | Disease Prevention Models                     | LGIS (Large group interactive session) |
| CV-CM-002  | <ul style="list-style-type: none"> <li>Describe primordial prevention and its application to preventing CVS diseases.</li> <li>Depict the concept of primary prevention in context to CVS and able to apply on CVS diseases.</li> </ul>                                                    |                                      | Primordial Prevention                         | LGIS (Large group interactive session) |
| CV-CM-003  | <ul style="list-style-type: none"> <li>Discuss the basic concept of health promotion and its application to CVS.</li> </ul>                                                                                                                                                                |                                      | Health Promotion                              | LGIS (Large group interactive session) |
| CV-CM-004  | <ul style="list-style-type: none"> <li>Discuss various methods of behavioral change interventions at community level.</li> </ul>                                                                                                                                                           |                                      | Behavioral Change Intervention                | LGIS (Large group interactive session) |
| CV-CM-005  | <ul style="list-style-type: none"> <li>To apply secondary and tertiary preventions on CVS diseases (coronary heart disease, ischemic heart disease, hypertension)</li> </ul>                                                                                                               |                                      | Secondary & Tertiary Prevention               | LGIS (Large group interactive session) |
| CV-CM-006  | <ul style="list-style-type: none"> <li>Describe the concept of cardiovascular diseases as non-communicable diseases</li> </ul>                                                                                                                                                             |                                      | Non-communicable disease                      | LGIS (Large group interactive session) |
| CV-CM-007  | <ul style="list-style-type: none"> <li>Identify the risk factors in the community for CVS diseases.</li> <li>Learn and apply interventions to prevent the risk factors in community.</li> </ul>                                                                                            |                                      | Risk factor assessment of CVS diseases        | LGIS (Large group interactive session) |
| CV-BhS-001 | <ul style="list-style-type: none"> <li>Identify and deal with the various psychosocial aspects of Cardiovascular conditions (such as Hypertension, Coronary artery disease, Heart failure, Arrhythmias, and other cardiovascular conditions) on Individual, Family and Society.</li> </ul> | Behavioral Sciences                  | Personal, Psychosocial, and vocational issues | LGIS (Large group interactive session) |

## Aging

| CODE       | SPECIFIC LEARNING OUTCOMES                                                                                                                              | TOTAL HOURS=5                         |                                       | MIT (Mode of information transfer) |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------|------------------------------------|
|            |                                                                                                                                                         | DISCIPLINE                            | TOPIC                                 |                                    |
| CV-Ag- 002 | <ul style="list-style-type: none"> <li>Discuss the effect of age on blood vessels with reference to hypertension</li> </ul>                             | Geriatrics/ Medicine/ Biochemistry    | Hypertension                          |                                    |
| CV-Ag- 002 | <ul style="list-style-type: none"> <li>Discuss the risk of cardiac attack in old age and weather conditions</li> </ul>                                  |                                       | Cardiac Attack                        |                                    |
| CV-Ag- 003 | <ul style="list-style-type: none"> <li>Discuss the effect of age on valvular system of the heart.</li> </ul>                                            |                                       | Valvular diseases                     |                                    |
| CV-Ag- 004 | <ul style="list-style-type: none"> <li>Discuss the effect of age on neural conduction of the heart in relation to arrhythmia.</li> </ul>                |                                       | Arrhythmia                            |                                    |
| CV-Ag- 005 | <ul style="list-style-type: none"> <li>Discuss the protective role of female hormone against CVS diseases in women of reproductive age group</li> </ul> | Physiology/ Obstetrics and Gynecology | Role of female hormone on CVS disease |                                    |

## Distribution of teaching hours amongst disciplines

|                           |     |
|---------------------------|-----|
| Module Weeks              | 7   |
| Recommended Minimum Hours | 188 |



## Rationale of Respiratory-1 MODULE

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

### Module Outcomes

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

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

### THEMES

- Ribcage
- Thoracic vertebrae Upper
- respiratory system
- Lower Respiratory system

### Clinical Relevance

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

# **CURRICULUM OF INDIVIDUALSUBJECTS**

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# Human Anatomy

| CODE     | SPECIFIC LEARNING OUTCOMES                                                                                                                                                                                                                                                           | TOTAL HOURS=24                         |                         | MIT (Mode of information transfer)     |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|-------------------------|----------------------------------------|
|          | GROSS ANATOMY                                                                                                                                                                                                                                                                        | DISCIPLINE                             | TOPIC                   |                                        |
| Re-A-001 | <ul style="list-style-type: none"><li>Describe the anatomical features and neurovascular supply of nasal cavity.</li><li>Describe the anatomical features and neurovascular supply of pharynx.</li><li>Describe the anatomical features and neurovascular supply of larynx</li></ul> | Human Anatomy                          | Upper respiratory tract | SGD (Small group discussion)           |
| Re-A-002 | <ul style="list-style-type: none"><li>Describe the anatomical features of the Trachea with its extent, relations, neurovascular supply, and lymphatics.</li></ul>                                                                                                                    |                                        | Trachea                 | SGD (Small group discussion)           |
| Re-A-003 | <ul style="list-style-type: none"><li>Give the boundaries of thoracic cavity, superior and inferior thoracic apertures and list the structures contained/ traversing them.</li></ul>                                                                                                 |                                        | Integrate with Surgery  | Thoracic Cavity                        |
|          | <ul style="list-style-type: none"><li>Describe the anatomical correlates of Thoracic inlet syndrome &amp; Thoracic outlet syndrome</li></ul>                                                                                                                                         | LGIS (Large group interactive session) |                         |                                        |
| Re-A-004 | <ul style="list-style-type: none"><li>Identify and differentiate the typical from atypical ribs.</li><li>Describe the anatomical features of ribs and give their attachments.</li></ul>                                                                                              | Human Anatomy                          | Rib Cage                | SGD (Small group discussion)           |
|          | <ul style="list-style-type: none"><li>Describe the anatomical correlates of supernumerary cervical rib.</li></ul>                                                                                                                                                                    | Integrate with Surgery                 |                         | LGIS (Large group interactive session) |
|          | <ul style="list-style-type: none"><li>Classify the articulations of the ribs.</li><li>Describe the anatomical features of these articulations.</li></ul>                                                                                                                             | Human Anatomy                          |                         | SGD (Small group discussion)           |
|          | <ul style="list-style-type: none"><li>Describe the movements with the muscles producing articulations.</li></ul>                                                                                                                                                                     |                                        |                         | SGD (Small group discussion)           |
|          | <ul style="list-style-type: none"><li>Describe the effects of fracture to the neck of rib and give its anatomical justification.</li><li>Describe the anatomical correlates of Flail Chest.</li></ul>                                                                                | Integrate with Orthopedics             |                         | LGIS (Large group interactive session) |
| Re-A-005 | <ul style="list-style-type: none"><li>Describe the anatomical correlates of Thoracotomy</li></ul>                                                                                                                                                                                    | Integrate with Surgery                 | Intercostal Space       | LGIS (Large group interactive session) |
|          | <ul style="list-style-type: none"><li>Define the attachments, relations, nerve supply and actions of intercostal muscles.</li><li>Define an intercostal space and give details of its contents</li></ul>                                                                             | Human Anatomy                          |                         | SGD (Small group discussion)           |
| Re-A-006 | <ul style="list-style-type: none"><li>Describe the anatomical features and attachments on typical &amp; atypical thoracic vertebrae.</li><li>Differentiate between typical and atypical vertebrae.</li><li>Explain the thoracic part of vertebral</li></ul>                          | Human Anatomy                          | Thoracic Vertebrae      | LGIS (Large group interactive session) |

|           |                                                                                                                                                                                                                                                                                                               |                            |                                  |                                        |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|----------------------------------|----------------------------------------|
|           | column (normal curvature, intervertebral joints, muscles & fascia of the back, blood supply, lymphatic drainage, nerve supply of back) Associated Clinical conditions -Kyphosis, Scoliosis                                                                                                                    |                            |                                  |                                        |
| Re-A- 007 | <ul style="list-style-type: none"><li>Describe the bony features and attachments on the sternum</li></ul>                                                                                                                                                                                                     | Human Anatomy              | Sternum                          | SGD (Small group discussion)           |
|           | <ul style="list-style-type: none"><li>Describe the anatomical correlates of sternal biopsy and median sternotomy.</li></ul>                                                                                                                                                                                   | Integrate with Surgery     |                                  | LGIS (Large group interactive session) |
|           | <ul style="list-style-type: none"><li>Describe the presentation of sternal fractures and correlate it anatomically</li></ul>                                                                                                                                                                                  | Integrate with Orthopedics |                                  | LGIS (Large group interactive session) |
| Re-A- 008 | <ul style="list-style-type: none"><li>Describe the endo thoracic fascia with its attachments.</li><li>Describe the supra-pleural membrane with its attachments.</li></ul>                                                                                                                                     | Human Anatomy              | Connective tissue of thorax      | SGD (Small group discussion)           |
| Re-A- 009 | <ul style="list-style-type: none"><li>Classify the joints of the thorax mentioning their articulations, movements with the muscle producing them.</li><li>Describe the mechanism of inspiration and expiration.</li></ul>                                                                                     | Human Anatomy              | Joints of thorax                 | SGD (Small group discussion)           |
| Re-A- 010 | <ul style="list-style-type: none"><li>Describe the origin, course, relations and distribution of intercostal nerves and vessels.</li></ul>                                                                                                                                                                    | Human Anatomy              | Neurovascular supply of thorax   | SGD (Small group discussion)           |
|           | <ul style="list-style-type: none"><li>Describe the alternate routes of venous drainage in blockage of superior/ inferior vena cava</li></ul>                                                                                                                                                                  | Integrate with medicine    |                                  | LGIS (Large group interactive session) |
| Re-A- 011 | <ul style="list-style-type: none"><li>Describe the cutaneous nerve supply and dermatomes of thorax.</li></ul>                                                                                                                                                                                                 | Human Anatomy              | Cutaneous nerve supply of thorax | SGD (Small group discussion)           |
|           | <ul style="list-style-type: none"><li>Give anatomical justification of the manifestations of herpes zoster infection on thoracic wall.</li></ul>                                                                                                                                                              | Integrate with medicine    |                                  | LGIS (Large group interactive session) |
|           | <ul style="list-style-type: none"><li>Discuss anatomical correlates of intercostal nerve block</li></ul>                                                                                                                                                                                                      |                            |                                  | LGIS (Large group interactive session) |
| Re-A- 012 | <ul style="list-style-type: none"><li>Name the parts of diaphragm mentioned their attachments and neurovascular supply.</li><li>Explain the role of diaphragm in respiration.</li><li>Enumerate the diaphragmatic apertures with their vertebral levels, mentioning the structures traversing them.</li></ul> | Human Anatomy              | Diaphragm                        | SGD (Small group discussion)           |
| Re-A- 013 | <ul style="list-style-type: none"><li>Describe the pleura giving its parts, layers, neurovascular supply, and lymphatic drainage.</li><li>Describe the pleural cavity giving its recesses and the lines of pleural reflection</li></ul>                                                                       | Human Anatomy              | Pleural cavity                   | LGIS (Large group interactive session) |

|                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                  |                                    |                                        |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|------------------------------------|----------------------------------------|
|                                     | <ul style="list-style-type: none"><li>Describe the anatomical correlates of pleural pain pleurisy, pneumothorax, pleural effusion</li></ul>                                                                                                                                                                                                                                                                                                                                                                 | Integrate with Medicine          |                                    | LGIS (Large group interactive session) |
| Re-A- 014                           | <ul style="list-style-type: none"><li>Describe the anatomical features of, relations of lungs.</li><li>Describe the neurovascular supply and lymphatic drainage of lungs.</li><li>Compare and contrast the anatomical features and relations of right and left lung</li><li>Describe the root of the lung and pulmonary ligament with arrangement of structures at the hilum.</li><li>Define Bronchopulmonary segments. Give their vascular supply, lymphatic drainage, and clinical significance</li></ul> | Human Anatomy                    | Lungs                              | LGIS (Large group interactive session) |
|                                     | <ul style="list-style-type: none"><li>Describe the anatomical correlates of chest tube intubation.</li><li>Describe the anatomical correlates of Thoracentesis</li></ul>                                                                                                                                                                                                                                                                                                                                    | Integrate with surgery           |                                    | LGIS (Large group interactive session) |
|                                     | <ul style="list-style-type: none"><li>Describe the anatomical correlates of bronchoscopy</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                          | Integrate with Pulmonology       |                                    | LGIS (Large group interactive session) |
|                                     | <ul style="list-style-type: none"><li>Describe the anatomical basis for medico-legal significance of lungs in determining the viability of newborn</li></ul>                                                                                                                                                                                                                                                                                                                                                | Integrate with Forensic Medicine |                                    | LGIS (Large group interactive session) |
|                                     | <ul style="list-style-type: none"><li>Identify various anatomical landmarks on chest X-Rays, CT and MRI</li></ul>                                                                                                                                                                                                                                                                                                                                                                                           | Integrate with Radiology         |                                    | LGIS (Large group interactive session) |
| EMBRYOLOGY & POST-NATAL DEVELOPMENT |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | TOTAL HOURS = 05                 |                                    |                                        |
| CODE                                | SPECIFIC LEARNING OBJECTIVES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | DESCIPLINE                       | TOPIC                              | MIT (Mode of Information)              |
| Re-A- 015                           | <ul style="list-style-type: none"><li>Describe the development of ribs, sternum, and thoracic vertebrae. Give the associated congenital malformations</li></ul>                                                                                                                                                                                                                                                                                                                                             | Human Embryology                 | Bony components of thoracic Cavity | LGIS (Large group interactive session) |
| Re-A- 016                           | <ul style="list-style-type: none"><li>List the embryological sources of the diaphragm. Describe the events taking place in the development and descent of the Diaphragm. Describe the development of Thoracic cavities (Pleural &amp; Pericardial cavities)</li></ul>                                                                                                                                                                                                                                       | Human Embryology                 | Diaphragm & thoracic Cavity        | LGIS (Large group interactive session) |
|                                     | <ul style="list-style-type: none"><li>Describe the embryological basis of congenital anomalies of the diaphragm: diaphragmatic hernias, eventuation of diaphragm, epigastric hernia, hiatal hernia, retrosternal hernia</li></ul>                                                                                                                                                                                                                                                                           | Integrate with Pediatrics        |                                    | LGIS (Large group interactive session) |
| Re-A-017                            | <ul style="list-style-type: none"><li>Describe the development of upper respiratory tract: larynx and trachea</li></ul>                                                                                                                                                                                                                                                                                                                                                                                     | Human Embryology                 | Upper respiratory tract            | LGIS (Large group interactive session) |
|                                     | <ul style="list-style-type: none"><li>Describe congenital anomalies of larynx and trachea: laryngeal web, laryngeal atresia, tracheal stenosis, and atresia and the types of tracheo-esophageal fistulas.</li></ul>                                                                                                                                                                                                                                                                                         | Integrate with Pediatrics        |                                    | LGIS (Large group interactive session) |

| Re-A- 018                                              | <ul style="list-style-type: none"> <li>List the phases of lung development with their time periods. Describe the events taking place in each phase</li> </ul>                                                                                                                                      | Human Embryology          | Lungs                                  | LGIS (Large group interactive session) |
|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|----------------------------------------|----------------------------------------|
|                                                        | <ul style="list-style-type: none"> <li>Describe the embryological basis and clinical presentation of respiratory distress syndrome/Hyaline membrane disease, Ectopic lung lobes, congenital cysts of lung..</li> </ul>                                                                             | Integrate with Pediatrics |                                        | LGIS (Large group interactive session) |
| CODE                                                   | SPECIFIC LEARNING OBJECTIVES                                                                                                                                                                                                                                                                       | DISCIPLINE                | TOPIC                                  | MIT (Mode of information)              |
| <b>MICROSCOPIC ANATOMY (HISTOLOGY &amp; PATHOLOGY)</b> |                                                                                                                                                                                                                                                                                                    |                           | <b>Total Hours = 04</b>                |                                        |
| Re-A- 019                                              | <ul style="list-style-type: none"> <li>Give the general histological organization of respiratory system.</li> </ul>                                                                                                                                                                                | Histology                 | Organization of respiratory system     | LGIS (Large group interactive session) |
| Re-A- 020                                              | <ul style="list-style-type: none"> <li>Describe the microscopic features of respiratory epithelium &amp; olfactory epithelium</li> </ul>                                                                                                                                                           |                           | Respiratory epithelium                 | LGIS (Large group interactive session) |
| Re-A-021                                               | <ul style="list-style-type: none"> <li>Describe the histology of Nasopharynx</li> </ul>                                                                                                                                                                                                            |                           | Nasopharynx                            | LGIS (Large group interactive session) |
| Re-A-022                                               | <ul style="list-style-type: none"> <li>Describe the histological features of epiglottis and larynx</li> </ul>                                                                                                                                                                                      |                           | Epiglottis & larynx                    | LGIS (Large group interactive session) |
| Re-A-023                                               | <ul style="list-style-type: none"> <li>Describe the histological features of trachea and lungs</li> <li>Describe the histology of blood air barrier</li> </ul>                                                                                                                                     |                           | Trachea and Lungs<br>Blood Air Barrier | LGIS (Large group interactive session) |
| Re-A- 024                                              | <ul style="list-style-type: none"> <li>Explain the histological basis of:               <ul style="list-style-type: none"> <li>Laryngitis</li> <li>Singer's nodule</li> <li>Emphysema</li> <li>Pneumonia</li> <li>Atelectasis</li> <li>Infant respiratory distress syndrome</li> </ul> </li> </ul> | Integrate with pathology  | Clinical correlates                    | LGIS (Large group interactive session) |

| CODE     | SPECIFIC LEARNING OUTCOMES                                                                                                                                                                                                                                                                                                                                                                       | TOTAL HOURS = 05 |                                              | MIT (Mode of information transfer) |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|----------------------------------------------|------------------------------------|
|          |                                                                                                                                                                                                                                                                                                                                                                                                  | DISCIPLINE       | TOPIC                                        |                                    |
| Re-A-025 | <ul style="list-style-type: none"> <li>Identify, draw, and label the histologic sections of epiglottis and larynx.</li> </ul>                                                                                                                                                                                                                                                                    | Histology        | Epiglottis & larynx                          | Laboratory Practical               |
| Re-A-026 | <ul style="list-style-type: none"> <li>Describe the histological features of bronchial tree: trachea, bronchi, bronchioles, alveoli</li> </ul>                                                                                                                                                                                                                                                   |                  | Trachea & Organization of respiratory system | Laboratory Practical               |
| Re-A-027 | <ul style="list-style-type: none"> <li>Identify, draw, and label the histological sections of bronchial tree: trachea, bronchi, bronchioles, alveoli, Lung.</li> <li>Describe the mucosal changes encountered in the trachea-bronchial tree.</li> <li>Compare and contrast the histological features of various components of bronchial tree: trachea, bronchi, bronchioles, alveoli.</li> </ul> |                  | Bronchial tree & Lung                        | Laboratory Practical               |
| Re-A-028 | <ul style="list-style-type: none"> <li>Describe, compare, and contrast the light and electron microscopic features of type I and type II pneumocytes</li> </ul>                                                                                                                                                                                                                                  |                  | Pneumocytes                                  | Laboratory Practical               |

# Medical Physiology

| CODE      | SPECIFIC LEARNING OUTCOMES                                                                                                                                                                                                                                                                                                                    | TOTAL HOURS=45             |                                | MIT (Mode of information transfer)                                     |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|--------------------------------|------------------------------------------------------------------------|
|           | NORMAL ORGAN FUNCTIONS                                                                                                                                                                                                                                                                                                                        | DISCIPLINE                 | TOPIC                          |                                                                        |
| Re-P- 001 | <ul style="list-style-type: none"> <li>Enlist the muscles of inspiration and expiration in quiet breathing.</li> <li>Enlist the muscles of inspiration and expiration in labored breathing</li> </ul>                                                                                                                                         | Integrate with Anatomy     | Breathing                      | LGIS (Large group interactive session)                                 |
|           | <ul style="list-style-type: none"> <li>Explain the components of the work of breathing.</li> <li>Discuss the mechanics of pulmonary ventilation.</li> <li>Explain periodic breathing</li> </ul>                                                                                                                                               | Medical Physiology         |                                | LGIS (Large group interactive session)                                 |
|           | <ul style="list-style-type: none"> <li>Explain the causes and pathophysiology of sleep apnea</li> </ul>                                                                                                                                                                                                                                       | Integrate with medicine    |                                | LGIS (Large group interactive session)                                 |
| Re-P- 002 | <ul style="list-style-type: none"> <li>Define lung compliance.</li> <li>Enlist the factors that affect lung compliance.</li> <li>Draw the compliance diagram of air filled and saline filled lungs.</li> <li>Enlist the components of surfactant.</li> <li>Describe the role of surfactant in lung compliance</li> </ul>                      | Medical Physiology         | Lung Compliance                | LGIS (Large group interactive session)                                 |
|           | <ul style="list-style-type: none"> <li>Explain the role of surfactant in premature babies</li> </ul>                                                                                                                                                                                                                                          | Integrate with Pediatrics  |                                | LGIS (Large group interactive session)<br>PBL (Problem Based Learning) |
| Re-P- 003 | <ul style="list-style-type: none"> <li>Define the different lung volumes and capacities and their clinical significance.</li> <li>Discuss FEV1/ FVC ratio and its clinical significance.</li> <li>Enlist the lung volumes and capacities that cannot be measured by spirometer.</li> <li>Define dead space &amp; explain its types</li> </ul> | Medical Physiology         | Lung volumes and Capacities    | LGIS (Large group interactive session)                                 |
|           | <ul style="list-style-type: none"> <li>Discuss FEV1/FVC ratio in relation to Bronchial Asthma.</li> <li>Discuss FEV1/FVC ratio in relation to Chronic Obstructive Pulmonary disease/restrictive lung diseases</li> </ul>                                                                                                                      | Integrate with Pulmonology |                                | LGIS (Large group interactive session)<br>SGD (Small Group Discussion) |
| Re-P- 004 | <ul style="list-style-type: none"> <li>Define alveolar ventilation.</li> <li>Define minute respiratory volume</li> </ul>                                                                                                                                                                                                                      | Medical Physiology         | Alveolar ventilation           | LGIS (Large group interactive session)                                 |
| Re-P- 005 | <ul style="list-style-type: none"> <li>Explain the ultrastructure of respiratory membrane.</li> <li>Discuss the factors affecting diffusion of gases across the respiratory membrane.</li> <li>Explain the diffusion capacity of respiratory membrane for oxygen and</li> </ul>                                                               | Medical Physiology         | Principles of gaseous exchange | LGIS (Large group interactive session)                                 |

|           |                                                                                                                                                                                                                                                                                                                                                                       |                         |                                       |                                                                        |
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|           | carbon dioxide. <ul style="list-style-type: none"> <li>Define alveolar, pleural and transpulmonary pressure.</li> <li>Explain differences in the partial pressures of atmospheric, humidified, alveolar air and explain physiological basis of change in each pressure</li> </ul>                                                                                     |                         |                                       |                                                                        |
| Re-P- 006 | <ul style="list-style-type: none"> <li>Explain the different forms of transport of oxygen in the blood.</li> <li>Draw and explain oxyhemoglobin dissociation curve.</li> <li>Enlist the factors that cause rightward shift of oxyhemoglobin dissociation curve.</li> <li>Enlist the factors that cause leftward shift of oxyhemoglobin dissociation curve.</li> </ul> | Medical Physiology      | Transport of oxygen in the blood      | LGIS (Large group interactive session)<br>SGD (Small Group Discussion) |
|           | <ul style="list-style-type: none"> <li>Define; enlist the types, and causes of cyanosis</li> </ul>                                                                                                                                                                                                                                                                    | Integrate with Medicine |                                       | LGIS (Large group interactive session)                                 |
| Re-P- 007 | <ul style="list-style-type: none"> <li>Enlist different forms in which CO<sub>2</sub> is transported in the blood.</li> <li>Explain the Carboxyhemoglobin dissociation curve.</li> <li>Explain the Haldane effect.</li> <li>Explain the chloride shift/Hamburger phenomenon.</li> <li>Define the respiratory exchange ratio (RER)</li> </ul>                          | Medical Physiology      | Transport of CO <sub>2</sub> in blood | LGIS (Large group interactive session)<br>SGD (Small Group Discussion) |
| Re-P- 008 | <ul style="list-style-type: none"> <li>Explain the alveolar oxygen and carbon dioxide pressure when VA/Q = infinity, zero and normal</li> <li>Explain the concept of physiological shunt when VA/Q ratio is less than normal.</li> <li>Explain the concept of physiological dead space when VA/Q ratio is above normal</li> </ul>                                     | Medical Physiology      | VA/Q (Ventilation Perfusion Ratio)    | LGIS (Large group interactive session)                                 |
| Re-P- 009 | <ul style="list-style-type: none"> <li>Enlist the respiratory &amp; non-respiratory functions of lungs.</li> <li>Explain the nervous control of bronchiolar musculature.</li> <li>Trace the reflex arc of cough reflex and sneeze reflex</li> </ul>                                                                                                                   | Medical Physiology      | Protective Reflexes                   | LGIS (Large group interactive session)                                 |
| Re-P- 010 | <ul style="list-style-type: none"> <li>Explain the principal means by which acclimatization occurs.</li> <li>Explain the events that occur during acute mountain sickness</li> <li>Enlist the features of chronic mountain sickness</li> </ul>                                                                                                                        | Medical Physiology      | Aviation and Space                    | LGIS (Large group interactive session)                                 |
| Re-P- 011 | <ul style="list-style-type: none"> <li>Explain the pathophysiology, features, prevention, and treatment of decompression sickness.</li> </ul>                                                                                                                                                                                                                         | Medical Physiology      | Deep sea diving                       | LGIS (Large group interactive session)<br>PBL (Problem Based Learning) |
| Re-P- 012 | <ul style="list-style-type: none"> <li>Draw and explain the effect of CO poisoning on oxyhemoglobin dissociation curve</li> </ul>                                                                                                                                                                                                                                     | Medical Physiology      | CO poisoning                          | LGIS (Large group interactive session)                                 |

|           |                                                                                                                                                                                                                                  |                          |                                   |                                                                        |
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|           | <ul style="list-style-type: none"> <li>Explain the pathophysiology, features, and treatment of CO poisoning.</li> </ul>                                                                                                          | Integrate with medicine  |                                   | LGIS (Large group interactive session)<br>SGD (Small Group Discussion) |
| Re-P- 013 | <ul style="list-style-type: none"> <li>Enumerate the components of respiratory centers and explain their functions.</li> </ul>                                                                                                   | Medical Physiology       | Nervous regulation of respiration | LGIS (Large group interactive session)                                 |
|           | <ul style="list-style-type: none"> <li>Explain the inspiratory RAMP signal</li> </ul>                                                                                                                                            |                          |                                   | LGIS (Large group interactive session)                                 |
|           | <ul style="list-style-type: none"> <li>Explain the Herring Breuer reflex/lung inflation reflex and its clinical significance</li> </ul>                                                                                          |                          |                                   | LGIS (Large group interactive session)                                 |
| Re-P- 014 | <ul style="list-style-type: none"> <li>Explain the location of chemo sensitive area (central chemoreceptors) and peripheral chemoreceptors</li> </ul>                                                                            | Medical Physiology       | Chemical control of respiration   | LGIS (Large group interactive session)                                 |
|           | <ul style="list-style-type: none"> <li>Explain the effect of hydrogen ions &amp; carbon dioxide on the chemo- sensitive area</li> </ul>                                                                                          |                          |                                   | LGIS (Large group interactive session)                                 |
|           | <ul style="list-style-type: none"> <li>Explain the role of oxygen in the control of respiration/peripheral chemoreceptors</li> </ul>                                                                                             |                          |                                   | LGIS (Large group interactive session)                                 |
| Re-P- 015 | <ul style="list-style-type: none"> <li>Explain the regulation of Respiration during Exercise</li> </ul>                                                                                                                          | Medical Physiology       | Exercise and respiration          | LGIS (Large group interactive session)                                 |
| Re-P- 016 | <ul style="list-style-type: none"> <li>Enlist the effects of acute hypoxia.</li> <li>Explain the hypoxia inducible factor a masters switch for body response to hypoxia</li> </ul>                                               | Medical Physiology       | Hypoxia                           | LGIS (Large group interactive session)                                 |
|           | <ul style="list-style-type: none"> <li>Define and explain different types of hypoxias</li> </ul>                                                                                                                                 | Integrate with Medicine  |                                   | LGIS (Large group interactive session)                                 |
| Re-P- 017 | <ul style="list-style-type: none"> <li>Explain the pathophysiology of Tuberculosis.</li> </ul>                                                                                                                                   | Integrate with pathology | Tuberculosis                      | LGIS (Large group interactive session)                                 |
| Re-P- 018 | <ul style="list-style-type: none"> <li>Describe the pathophysiology of Pneumonia</li> </ul>                                                                                                                                      | Integrate with pathology | Pneumonia                         | LGIS (Large group interactive session)                                 |
| Re-P- 019 | <ul style="list-style-type: none"> <li>Define Dyspnea</li> <li>Enlist different causes of dyspnea.</li> <li>Differentiate between cardiac and respiratory dyspnea.</li> <li>Outline management strategies for dyspnea</li> </ul> | General Medicine         | Dyspnea                           | LGIS (Large group interactive session)                                 |
| Re-P- 020 | <ul style="list-style-type: none"> <li>Enlist the causes of Pneumothorax.</li> <li>Describe the signs and symptoms of Pneumothorax</li> </ul>                                                                                    | Surgery                  | Pneumothorax                      | LGIS (Large group interactive session)                                 |
| Re-P- 021 | <ul style="list-style-type: none"> <li>Enlist the causes of Pleuritis.</li> <li>Describe the signs and symptoms of Pleuritis.</li> <li>Discuss the management of Pleuritis</li> </ul>                                            |                          | Pleuritis                         | LGIS (Large group interactive session)                                 |
| Re-P- 022 | <ul style="list-style-type: none"> <li>Enlist the causes of Bronchitis.</li> <li>Discuss the signs and symptoms of Bronchitis.</li> </ul>                                                                                        |                          | Bronchitis                        | LGIS (Large group interactive session)                                 |

|           |                                                                                                                                                                                                                                                                           |                  |                                     |                                                                        |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-------------------------------------|------------------------------------------------------------------------|
|           | <ul style="list-style-type: none"> <li>Discuss the management of Bronchitis</li> </ul>                                                                                                                                                                                    | General Medicine |                                     |                                                                        |
| Re-P- 023 | <ul style="list-style-type: none"> <li>Classify different types of pneumonia.</li> <li>Discuss the sign symptoms of pneumonia.</li> <li>Discuss the management of pneumonia</li> </ul>                                                                                    |                  | Pneumonia                           | LGIS (Large group interactive session)                                 |
| Re-P- 024 | <ul style="list-style-type: none"> <li>Classify different types of asthma.</li> <li>Discuss the signs and symptoms of asthma.</li> <li>Discuss the management of asthma</li> </ul>                                                                                        |                  | Asthma                              | LGIS (Large group interactive session)<br>PBL (Problem Based Learning) |
| Re-P- 025 | <ul style="list-style-type: none"> <li>Classify different types of Tuberculosis.</li> <li>Discuss the signs and symptoms of tuberculosis.</li> <li>Discuss the management of Tuberculosis</li> </ul>                                                                      |                  | Tuberculosis                        | LGIS (Large group interactive session)                                 |
| Re-P- 026 | <ul style="list-style-type: none"> <li>Classify different types of acute respiratory distress syndrome.</li> <li>Discuss the signs and symptoms of acute respiratory distress syndrome.</li> <li>Discuss the management of acute respiratory distress syndrome</li> </ul> | General Medicine | Acute respiratory distress syndrome | LGIS (Large group interactive session)                                 |
| Re-P- 027 | <ul style="list-style-type: none"> <li>Define respiratory failure.</li> <li>Describe various types of respiratory failure.</li> <li>Enlist various causes of respiratory failure.</li> <li>Outline management strategies of respiratory failure</li> </ul>                | General Medicine | Respiratory Failure                 | LGIS (Large group interactive session)                                 |
| Re-P- 028 | <ul style="list-style-type: none"> <li>Describe ABC in a trauma patient</li> </ul>                                                                                                                                                                                        | Surgery          | First Aid in Surgical Patients      | LGIS (Large group interactive session)                                 |

| CODE     | SPECIFIC LEARNING OUTCOMES                                                                                                                                               | TOTAL HOURS= 10    |                                       | MIT (Mode of information transfer) |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|------------------------------------|
|          | PHYSIOLOGY PRACTICALS                                                                                                                                                    | DISCIPLINE         | TOPIC                                 |                                    |
| Re-P-029 | <ul style="list-style-type: none"> <li>Perform the clinical examination of chest for the respiratory system (inspection, palpation, Percussion, Auscultation)</li> </ul> | Medical Physiology | Clinical Examination of Chest         | Practical/Demonstrations           |
| Re-P-030 | <ul style="list-style-type: none"> <li>Determine Peak Expiratory Flow rate with Peak Flow Meter</li> </ul>                                                               |                    | Peak Expiratory Flow rate measurement |                                    |
| Re-P-031 | <ul style="list-style-type: none"> <li>Determine Blood Oxygen Saturation with finger Pulse Oximeter</li> </ul>                                                           |                    | Oxygen Saturation                     |                                    |
| Re-P-032 | <ul style="list-style-type: none"> <li>Determine Respiratory Volumes &amp; Capacities with Spirometer/ Spiro lab. (FEV1/FVC ratio)</li> </ul>                            |                    | Spirometry                            |                                    |
| Re-P-033 | <ul style="list-style-type: none"> <li>Student should be able to Record the movements of chest by stethograph</li> </ul>                                                 |                    | Chest movements                       |                                    |

## Medical Biochemistry

| CODE      | SPECIFIC LEARNING OUTCOMES                                                                                                                                                                                       | TOTAL HOURS=30            |                   | MIT (Mode of information transfer)                                                              |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-------------------|-------------------------------------------------------------------------------------------------|
|           | BIOCHEMISTRY                                                                                                                                                                                                     | DISCIPLINE                | TOPIC             |                                                                                                 |
| Re-B- 001 | <ul style="list-style-type: none"> <li>Explain and interpret the pedigree of single gene defect i.e., Emphysema and cystic fibrosis (autosomal recessive)</li> </ul>                                             | Medical Biochemistry      | Genetic defects   | LGIS (Large group interactive session) / Tutorials / SGD (Small Group Discussion)/Presentations |
| Re-B- 002 | <ul style="list-style-type: none"> <li>Explain the biochemical significance of phospholipids</li> </ul>                                                                                                          | Medical Biochemistry      | Phospholipids     | LGIS (Large group interactive session) / Tutorials / SGD (Small Group Discussion)/Presentations |
|           | <ul style="list-style-type: none"> <li>Interpret Respiratory Distress syndrome based on given data</li> </ul>                                                                                                    | Integrate with Physiology |                   |                                                                                                 |
| Re-B- 003 | <ul style="list-style-type: none"> <li>Describe the structure, synthesis, degradation, and functions of Elastin</li> </ul>                                                                                       | Medical Biochemistry      | Elastin           | LGIS (Large group interactive session)                                                          |
|           | <ul style="list-style-type: none"> <li>Discuss the pathophysiology of Emphysema.</li> </ul>                                                                                                                      | Integrate with Pathology  |                   |                                                                                                 |
| Re-B- 004 | <ul style="list-style-type: none"> <li>Discuss the concept of acid base balance.</li> <li>Interpret metabolic and respiratory disorders of acid base balance based on sign, symptoms and ABG findings</li> </ul> | Medical Biochemistry      | Acid base balance | LGIS (Large group interactive session) / Tutorials / SGD (Small Group Discussion)/Presentations |
|           | <ul style="list-style-type: none"> <li>Describe the Clinical interpretation of acid base balance</li> </ul>                                                                                                      | Integrate with Medicine   |                   |                                                                                                 |

| CODE      | SPECIFIC LEARNING OUTCOMES                                                                     | TOTAL HOURS=8        |                     | MIT (Mode of information transfer) |
|-----------|------------------------------------------------------------------------------------------------|----------------------|---------------------|------------------------------------|
|           | BIOCHEMISTRY PRACTICALS                                                                        | DISCIPLINE           | TOPIC               |                                    |
| Re-B- 005 | <ul style="list-style-type: none"> <li>Determine the pH of the solution by pH meter</li> </ul> | Medical Biochemistry | Determination of pH | Demonstration<br><br>Performance   |

## Pathophysiology and Pharmacotherapeutics

| CODE       | SPECIFIC LEARNING OUTCOMES                                                                                                                                                                         | TOTAL HOURS= 4+7= 11        |                                     | MIT (Mode of information transfer)     |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------------------------------------|----------------------------------------|
|            |                                                                                                                                                                                                    | DISCIPLINE                  | TOPIC                               |                                        |
| Re-Ph- 001 | <ul style="list-style-type: none"> <li>Identify the drugs for cough suppression &amp; expectoration.</li> <li>Explain the mechanism of action and adverse effects of cough suppressants</li> </ul> | Pharmacology & Therapeutics | Cough Suppressants                  | LGIS (Large group interactive session) |
| Re-Ph- 002 | <ul style="list-style-type: none"> <li>Explain the mechanism of action and adverse effects of antihistamines</li> </ul>                                                                            |                             | Antihistamines                      | LGIS (Large group interactive session) |
| Re-Ph- 003 | <ul style="list-style-type: none"> <li>Explain the mechanism of action and adverse effects of anti-asthmatics</li> </ul>                                                                           |                             | Anti- asthmatics                    | LGIS (Large group interactive session) |
| Re-Pa- 001 | <ul style="list-style-type: none"> <li>Describe the pathophysiology of acute respiratory distress syndrome</li> </ul>                                                                              | Pathology                   | Acute Respiratory Distress Syndrome | LGIS (Large group interactive session) |
| Re-Pa- 002 | <ul style="list-style-type: none"> <li>Describe the pathophysiology of obstructive lung disease</li> </ul>                                                                                         |                             | Obstructive lung Disease            | LGIS (Large group interactive session) |
| Re-Pa- 003 | <ul style="list-style-type: none"> <li>Describe the pathophysiology of Restrictive Lung Disease</li> </ul>                                                                                         |                             | Restrictive Lung Disease            | LGIS (Large group interactive session) |

## Disease Prevention and Impact

| CODE       | SPECIFIC LEARNING OUTCOMES                                                                                                                                                                                                                                                                                  | TOTAL HOURS=15                       |                                                  | MIT (Mode of information transfer)     |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|--------------------------------------------------|----------------------------------------|
|            |                                                                                                                                                                                                                                                                                                             | DISCIPLINE                           | TOPIC                                            |                                        |
| Re-CM-001  | <ul style="list-style-type: none"> <li>Identify the common risk factors of acute respiratory infections with emphasis on smoking.</li> <li>Discuss preventive strategies of different problems related to respiratory system.</li> <li>Enlist the common vaccines used for the prevention of ARI</li> </ul> | Community Medicine and Public Health | Prevention of acute respiratory infections (ARI) | LGIS (Large group interactive session) |
|            | <ul style="list-style-type: none"> <li>Explain the role of vitamins in the respiratory tract infections</li> </ul>                                                                                                                                                                                          | Integrate with Biochemistry          |                                                  | LGIS (Large group interactive session) |
| Re-CM-002  | <ul style="list-style-type: none"> <li>Explain the effect of air pollutants on the respiratory system</li> </ul>                                                                                                                                                                                            | Community Medicine And Public Health | Interaction of environment & Respiratory system  | LGIS (Large group interactive session) |
| Re-CM-003  | <ul style="list-style-type: none"> <li>Describe the burden of respiratory diseases</li> </ul>                                                                                                                                                                                                               |                                      | Epidemiology of respiratory diseases             | LGIS (Large group interactive session) |
| Re-CM-004  | <ul style="list-style-type: none"> <li>Enlist the common respiratory diseases related to occupation</li> </ul>                                                                                                                                                                                              |                                      | Occupational Lung Diseases                       | LGIS (Large group interactive session) |
| Re-BhS-001 | <ul style="list-style-type: none"> <li>Identify the psychosocial factors leading to dyspnea.</li> </ul>                                                                                                                                                                                                     | Behavioral sciences                  | Dyspnea                                          | LGIS (Large group interactive session) |
| Re-BhS-002 | <ul style="list-style-type: none"> <li>Identify the psychosocial factors leading to psychogenic cough.</li> </ul>                                                                                                                                                                                           |                                      | Psychogenic cough                                | LGIS (Large group interactive session) |
| Re-BhS-003 | <ul style="list-style-type: none"> <li>Identify and deal with the various psychosocial aspects of Respiratory conditions (such as Asthma, COPD, Tuberculosis, Cystic Fibrosis, Sleep Apnea) on Individual, Family and Society.</li> </ul>                                                                   |                                      | Personal, Psychosocial, and vocational issues    | LGIS (Large group interactive session) |

# Aging

| CODE       | SPECIFICLEARNINGOUTCOMES                                                                                                                                                            | TOTALHOURS=5 |                                                  | MIT (Mode of information transfer)     |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------------------------------------------|----------------------------------------|
|            |                                                                                                                                                                                     | DISCIPLINE   | TOPIC                                            |                                        |
| Re-Ag- 001 | <ul style="list-style-type: none"><li>Discuss the effect of age on decreased lung compliance</li></ul>                                                                              | Pathology    | Age-induced lung fibrosis                        | LGIS (Large group interactive session) |
| Re-Ag- 002 | <ul style="list-style-type: none"><li>Discuss the role of age on respiratory clearance leading to recurrent inflammatory processes at the ciliated respiratory epithelium</li></ul> |              | Increased vulnerability to infection & neoplasia | LGIS (Large group interactive session) |

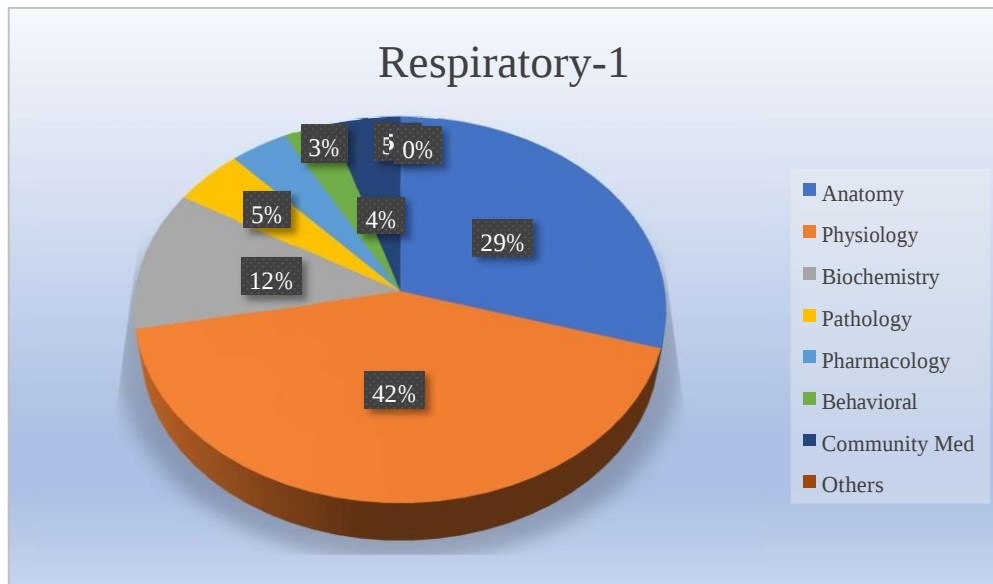
# PERLs (PROFESSIONALISM, ETHICS, RESEARCH, LEADERSHIP)

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

## Clinical Skills (C-FRC)

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

## Distribution of teaching hours



| Module Weeks | Recommended Minimum Hours |
|--------------|---------------------------|
| 04           | 128                       |

# Instructional Strategies

## Large Group interactive Session (LGIS)

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

### Significance of its usage

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

## Team Based Learning (TBL)

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

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

### Significance of its usage

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

## Problem based learning (PBL)

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

### Significance of its usage

- Teamwork
- Critical evaluation of literature
- Self-directed learning and use of resources
- Presentation skills
- Leadership

## Case based learning (CBL)

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

### **Significance of its usage**

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

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### **Small Group Discussion (SGD)**

SGD is a class or short series of classes, in which one or more instructors provides intensive instruction on some subject to a small group.

### **Significance of its usage**

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

### **Reflective Writing**

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

### **Significance of its usage**

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

### **Bedside Teaching**

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

### **Significance of its usage**

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

### **Skills Laboratories**

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

### **Significance of its usage**

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

### **Laboratory Practical**

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

### **Significance of its usage**

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

Develop teamwork abilities.

### **Demonstrations**

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

### **Significance of its usage**

- Promotes learning and correlates theory with practice.
- Sharpens observation skills.
- Sustain interests in learning environment.

### **Case Presentations**

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

### **Significance of its usage**

- Cultivate the capacity for critical analysis.
- Judgement and Decision making Facilitate creative problem solving.

Allow students to develop realistic solutions to complex problems

# Assessment Strategies

## **Assessment tools for Theory**

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

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

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

# RESOURCE BOOKS

## **Anatomy**

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

## **Physiology**

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

## **Biochemistry**

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

## **Pathology**

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

## **Pharmacology**

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

## **Behavioral Sciences**

- Handbook of Behavioral Sciences by Prof. Mowadath Rana, 3<sup>rd</sup> Edition
- Integrating Behavioral Sciences in Healthcare by Asma Humayun & Michael Herbert.

## **Community medicine**

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

## **Islamiyat/Pakistan studies Books**

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