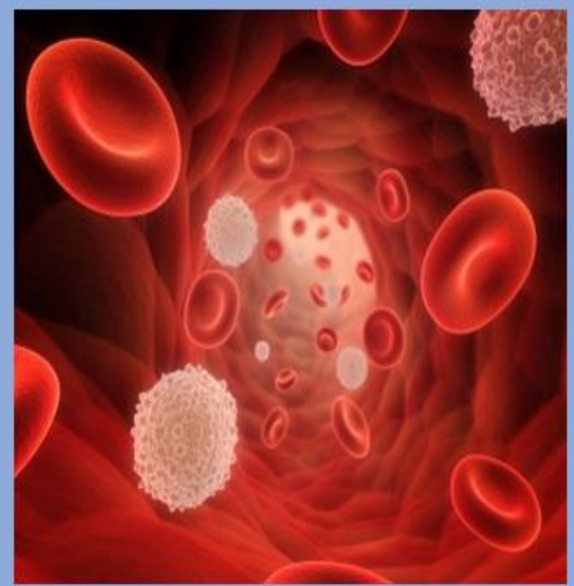
Rawalpindi Medical University
Department of Medical Education (DME)

# Study Guide
# Blood & Immunity Module 2024



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## Document Approval

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| Prof Naeem Akhtar, Dr Ifra Saeed, Dr Sidra Hamid, Dr Tehmina Qamar | 2017-2018 | 1st | Developed for First Year MBBS.<br>Composed of Horizontally and vertically Integrated Blood & Immunity Module. |
| Dr Tehzeeb, Dr Samia Sarwar, Dr Ifra Saeed, Dr Tehmina Qamar, Dr Sidra Hamid | 2019-2020 | 2nd | Developed for First Year MBBS.<br>Horizontally and vertically integrated<br>Learning objectives updated |
| Dr Tehzeeb, Dr Samia Sarwar, Dr Ayesha Yousaf Dr Ifra Saeed, Dr Tehmina Qamar, Dr Sidra Hamid | 2021-2022 | 3rd | Developed for First Year MBBS.<br>Horizontally and vertically integrated<br>Learning objectives updated,<br>Research curriculum incorporated |
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| Dr Ayesha Yousaf, Dr Samia Sarwar, Dr Ayesha Yousaf Dr Ifra Saeed, Dr Tehmina Qamar, Dr Sidra Hamid | 2023-2024 | 5th | Developed for First Year MBBS.<br>Horizontally and vertically integrated<br>Learning objectives updated,<br>Research curriculum revamped Bioethics, Family Medicine curriculum incorporated along with Professionalism.<br>Entrepreneurship curriculum incorporated |

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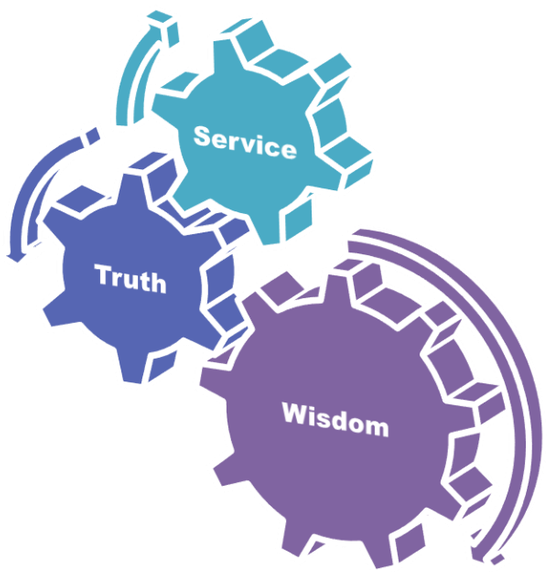
# University Moto, Vision, Values & Goals

## RMU Motto




## Mission Statement

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

## Vision and Values

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

## Goals of the Undergraduate Integrated Modular Curriculum

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

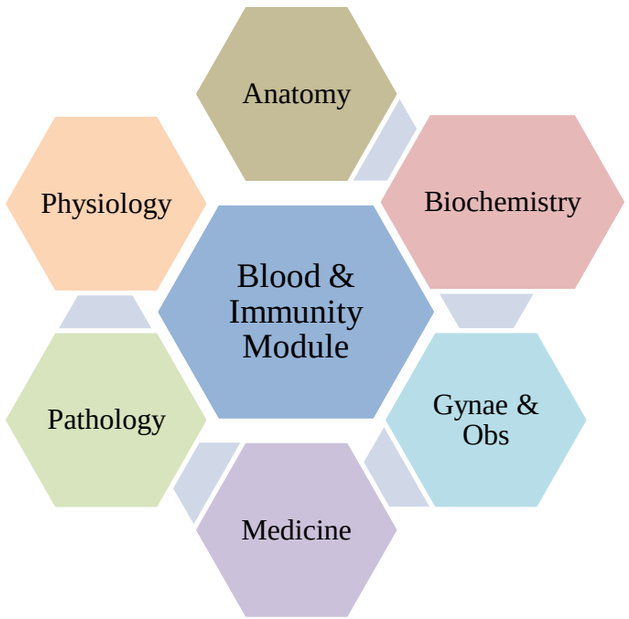
- Provide thorough grounding in the basic theoretical concepts underpinning the practice of medicine.
- Develop and polish the skills required for providing medical services at all levels of the health care delivery system.
- Help you attain and maintain the highest possible levels of ethical and professional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

# First Year MBBS 2024

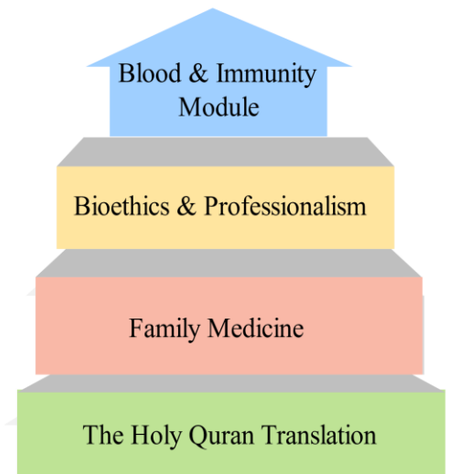
## Study Guide

## Blood and Immunity Module

## Integration of Disciplines in Blood & Immunity Module




## Spiral / General Education Cluster Courses



# Discipline wise Details of Modular Contents

| Block | Subjects | Embryology | Histology | Gross Anatomy | CBL | SDL |
|---|---|---|---|---|---|---|
| II | • Anatomy | • Development of pharyngeal arches<br>• Development of spleen<br>• Development of thymus | • Spleen<br>• Thymus<br>• Lymph nodes<br>• Tonsils | Lower Limb<br>• Posterior compartment of leg to foot | • Ankle sprain<br>• Flat foot | • Posterior compartment of leg and flexor retinaculum<br>• Neurovascular organization of posterior compartment of leg<br>• Foot joints<br>• Ankle joints<br>• Sole of foot<br>• Spleen<br>• Gait cycle |
| | • Physiology | • Plasma Proteins<br>• Stages of erythropoiesis & factors affecting erythropoiesis<br>• Hemoglobin & Hemoglobinopathies, Iron Metabolism<br>• Red cell fragility, ESR & Red cell indices, Anemia & polycythemia<br>• Fate of RBCs & Jaundice<br>• Types of immunity, Physiology of innate immunity tolerance & auto immunity<br>• Physiology of acquired immunity B-Cells<br>• Physiology of acquired immunity T-Cells. Allergy and Hypersensitivity reactions, Auto-immune diseases and AIDS<br>• Composition of blood & Hemopoiesis<br>• WBCs classification & formation. Neutrophils, Eosinophils & Basophils and their properties<br>• Platelet formation & function. hemostasis, blood coagulation tests (BT, CT, PT, APTT and INR<br>• Blood coagulation<br>• Concept of intravascular anticoagulants and bleeding disorders (Vit K deficiency, hemophilia and thrombocytopenia)<br>• Thromboembolic condition (DVT, Pulmonary Embolism, DIC) Anticoagulant therapy (Heparin, warfarin, Prevention of blood clotting outside the body)<br>• Physiological mechanism of temperature regulation<br>• Role of Hypothalamus in temperature regulation<br>• Disorders of temperature regulation (Fever, Heat stroke, Exposure of body to extreme cold)<br>• ABO & Rh Blood grouping system<br>• Rh Blood grouping system and Erythroblastosis fetalis<br>• Blood transfusion hazards<br>• Tissue and organ transplantations | | | | |

| | | |
|---|---|---|
| | • Biochemistry | • Heme synthesis<br>• Porphyria<br>• Breakdown of hemoglobin<br>• Jaundice<br>• Blood<br>• Structure of hemoglobin and myoglobin<br>• Types of Hemoglobin<br>• Oxygen dissociation curve.<br>• Abnormalities in Hemoglobin.<br>• Hemoglobinopathies<br>• Plasma proteins<br>• Acute phase proteins & Albumin<br>• Haptoglobin and transferring.<br>• Ferritin and hemosiderin<br>• Ceruloplasmin.<br>• Antiproteases and amyloidosis<br>• Immunoglobulins<br>• AIDs<br>• Folic acid.<br>• Vitamin B12<br>• Iron |
| | Spiral Courses | |
| | • Bioethics & Professionalism | • Activity I<br>• Activity II<br>• Activity III |
| | • Family Medicine | • Aproach to a Patient Aneamia |
| | • The Holy Quran Translation | • Muaamlaat<br>• Muaasharat |
| | Vertical components | |
| | • Pathology | • Mediators of Inflammation<br>• (Medicine) |
| | • Medicine | • Anemia<br>• Jaundice |
| | • Gynae & Obs | • Rh Incompatibility And Its Significance -Immune |
| | Early Clinical Exposure (ECE) | |
| | • Medicine | • Immunodeficiency cases |

| | | |
|---|---|---|
| | | • Hepatosplenomegaly<br>• Lymphadenopathy |
| | • Pediatrics | • Neonatal Jaundice<br>• ABO/ Rh Incompatibility<br>• Lymphadenopathy/ Hepatosplenomegaly |
| | • Pathology Laboratory | Identification of Slides of Spherocytosis<br>• Microcytosis<br>• Leukocytosis<br>• Lymph node<br>• Bone Marrow |

# Table of Contents

# Blood and Immunity Module Team

| | | |
|---|---|---|
| Module Name | : | Blood and Immunity Module |
| Duration of module | : | 05 Weeks |
| Coordinator | : | Dr. Rahat |
| Co-coordinator | : | Dr. Kamil Tahir |
| Reviewed by | : | Module Committee |

| Module Committee | | |
|---|---|---|
| 1. | Vice Chancellor RMU | Prof. Dr. Muhammad Umar |
| 2. | Chairperson Anatomy & Dean Basic Sciences | Prof. Dr. Ayesha Yousaf |
| 3. | Director DME | Prof. Dr. Ifra Saeed |
| 4. | Chairperson Physiology | Prof. Dr. Samia Sarwar |
| 5. | Chairperson Biochemistry | Dr. Aneela Jamil |
| 6. | Focal Person Anatomy First Year MBBS | Asso. Prof. Dr. Mohtashim Hina |
| 7. | Focal Person Physiology | Dr. Sidra Hamid |
| 8. | Focal Person Biochemistry | Dr. Aneela Jamil |
| 9. | Focal Person Pharmacology | Dr. Zunera Hakim |
| 10. | Focal Person Pathology | Dr. Asiya Niazi |
| 11. | Focal Person Behavioral Sciences | Dr. Saadia Yasir |
| 12. | Focal Person Community Medicine | Dr. Afifa Kulsoom |
| 13. | Focal Person Quran Translation Lectures | Dr. Fahad Anwar |
| 14. | Focal Person Family Medicine | Dr. Sadia Khan |

| Module Task Force Team | | |
|---|---|---|
| 1. | Coordinator | Dr. Rahat (APWMO of Biochemistry) |
| 2. | DME Focal Person | Dr. Farzana Fatima |
| 3. | Co-coordinator | Dr. Ali Raza (Senior Demonstrator of Anatomy) |
| 4. | Co-Coordinator | Dr. Uzma Zafar (APWMO of Biochemistry) |
| 5. | Co-coordinator | Dr. Kamil Tahir (Senior Demonstrator Physiology) |

| DME Implementation Team | | |
|---|---|---|
| 1. | Director DME | Prof. Dr. Ifra Saeed |
| 2. | Assistant Director DME | Dr. Farzana Fatima |
| 3. | Implementation Incharge 1st & 2nd Year MBBS | Prof. Dr. Ifra Saeed<br>Dr. Farzana Fatima<br>Dr. Saira Aijaz |
| 4. | Editor | Muhammad Arslan Aslam |

# Module IV- Blood and Immunity Module

**Rationale**

Blood is a specialized connective tissue that delivers necessary substances such as nutrients and oxygen to the cells and transports metabolic waste products away from those same cells.. Blood accounts for 8% of the human body weight. The average adult has a blood volume of roughly 5 liters, composed of plasma and several kinds of cells (occasionally called corpuscles); these formed elements of the blood are erythrocytes (red blood cells, RBCs), leukocytes (white blood cells), and thrombocytes (platelets). By volume, the red blood cells constitute about 45% of whole blood, the plasma about 54.3%, and white cells about 0.7%.
White blood cells are part of the body's immune system; they destroy and remove old or aberrant cells and cellular debris, as well as attack infectious agents (pathogens) and foreign substances.
The rationale behind is to introduce the students the basic constituents, functions and transport of various substances through blood.

## Module Outcomes

By the end of the module, students will be able to:

### Knowledge

- This module is expected to build students basic knowledge about normal structure, organization, functions and development of blood and immunity system.
- Used technology based Medical Education including.
  **Artificial Intelligence**
- Appreciate concept and importance of
  **Biomedical Ethics,**
  **Research**
  **Family Medicine**

### Skills

- Demonstrate effective skill for performing and interpreting various laboratory tests like Haemin crystal test.
- Demonstrate awareness of ethical, legal and social implecation of issues related to bioethics.

### Attitude

- Demonstrate **professional attitude, team-building spirit and good communication specially in small group discussions.**

This module will run in 5 weeks duration. Instructional strategies are given in the timetable and learning objectives are given in the study guides. Study guides will be uploaded on the university website. Good luck!

## SECTION - I

# Terms & Abbreviations

**Contents**



**Tables & Figures**

## Table1. Domains of Learning According to Blooms Taxonomy

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

# Learning Methodologies / Strategies

## Large Group Interactive Session (LGIS)

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

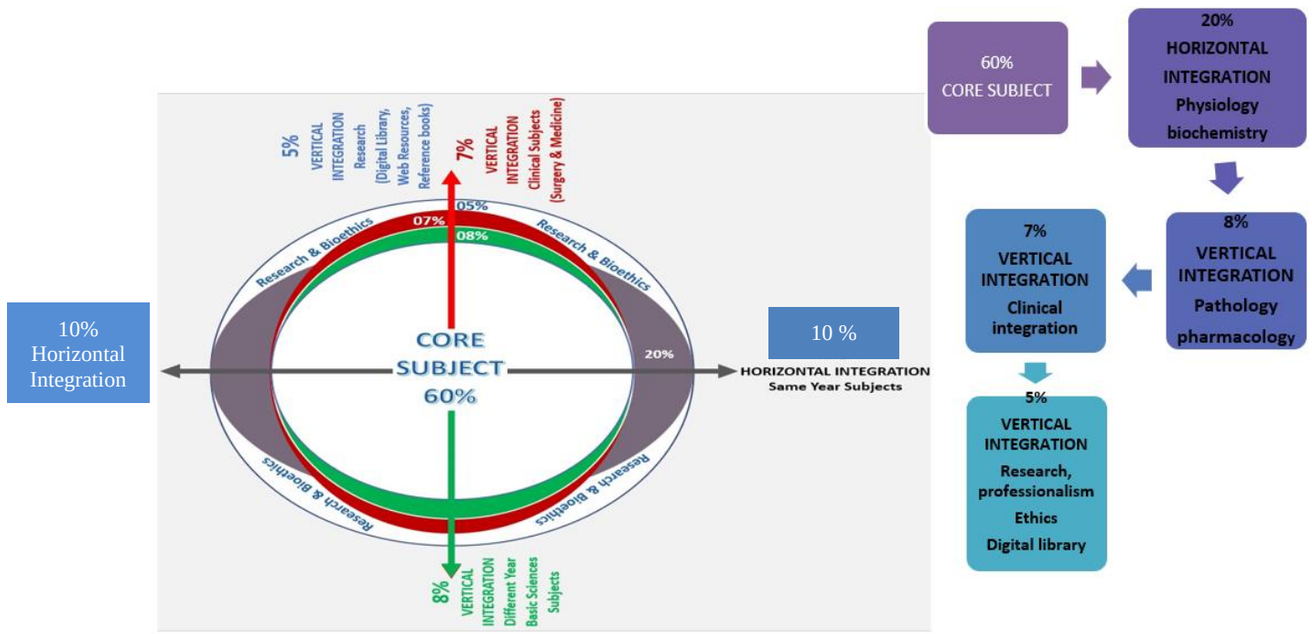



**Figure 1. Prof Umar's Model of Integrated Lecture**

## Small Group Discussion (SGD)

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

**Table 2. Standardization of teaching content in Small Group Discussions**

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

**Table 3. Steps of Implementaion of Small Group Discussions**

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

## Self Directed Learning (SDL)

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

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

  ii.OSPE station

## Case Based Learning (CBL)

- It's a learner centered model which engages students in discussion of specific scenarios that typically resemble real world examples.
- Case scenario will be given to the students
- Will engage students in discussion of specific scenarios that resemble or typically are real-world examples.
- Learning objectives will be given to the students and will be based on

  i. To provide students with a relevant opportunity to see theory in practice

  ii. Require students to analyze data in order to reach a conclusion.

  iii. Develop analytic, communicative, and collaborative skills along with content knowledge.

## Problem Based Learning (PBL)

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

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

**Figure 2. PBL 7 Jumps Model**

# Practical Sessions/Skill Lab (SKL)

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

## SECTION – II

# Learning Objectives, Teaching Strategies & Assesssments

### Contents

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

# Horizontally Integrated Basic Sciences (Anatomy, Physiology & Biochemistry)

## Anatomy Large Group Interactive Session (LGIS)

| Topic | At the End of The Session Students Should Be Able To: | Learning Domain | Teaching Strategy | Assessment Tools |
|---|---|---|---|---|
| (Histology) Lymph node | • Classify lymphoid tissue | C2 | LGIS | MCQ SAQ VIVA |
| | • Define diffuse lymphoid tissue, nodular lymphoid tissue and lymphoid organs | C1 | | |
| | • Discuss the histological features of lymph node | C2 | | |
| | • Enlist functions of lymph node | C1 | | |
| | • Understand the supporting elements of lymph node | C2 | | |
| | • Describe filtration through lymph node | C2 | | |
| | • Discuss importance of high endothelial venules in lymph node | C2 | | |
| | • Discuss the clinical correlation of lymph node | C3 | | |
| | • Correlate the clinical conditions | C3 | | |
| | • Understand the preventive and curative health care measures | C3 | | |
| | • Practice the principles of Bioethics | C3 | | |
| | • Apply strategic use of AI in health care | C3 | | |
| | • Read a research article | C3 | | |
| (Histology) Thymus & Tonsil | • Describe the location and functions of thymus | C1 | LGIS | MCQ SAQ VIVA |
| | • Enumerate different types of reticuloepithelial cells | C1 | | |
| | • Describe microscopic structure of thymus | C2 | | |
| | • Compare the histological structure of thymus and other lymphoid organs | C2 | | |
| | • Discuss blood thymus barrier | C2 | | |
| | • Describe general histological structure of tonsils | C2 | | |
| | • Differentiate palatine, lingual, and pharyngeal tonsils histologically | C2 | | |
| | • Discuss the clinical correlation of thymus | C3 | | |
| | • Correlate the clinical conditions | C3 | | |
| | • Understand the preventive and curative health care measures | C3 | | |
| | • Practice the principles of Bioethics | C3 | | |
| | • Read a research article | C3 | | |

| | | | | |
|---|---|---|---|---|
| (Histology) Spleen | • Describe the location and functions of spleen | C2 | LGIS | MCQ SAQ VIVA |
| | • Describe microscopic structure of spleen | C2 | | |
| | • Differentiate between red and white pulp of spleen | C2 | | |
| | • Discuss blood circulation through spleen | C2 | | |
| | • Discuss the clinical correlation of spleen | C3 | | |
| | • Correlate the clinical conditions | C3 | | |
| | • Understand the preventive and curative health care measures | C3 | | |
| | • Practice the principles of Bioethics | C3 | | |
| | • Read a research article | C3 | | |
| (Embryology) Development of Pharyngeal arches & pouches | • Define pharyngeal arches and pouches | C1 | LGIS | MCQ SAQ VIVA |
| | • Discuss the components of pharyngeal arches and pouches | C2 | | |
| | • Describe the development and fate of each pharyngeal arch and pouches | C2 | | |
| | • Discuss the clinical correlation of pharyngeal arches and pouches | C3 | | |
| | • Correlate the clinical conditions | C3 | | |
| | • Understand the preventive and curative health care measures | C3 | | |
| | • Practice the principles of Bioethics | C3 | | |
| | • Read a research article | C3 | | |

## Physiology Large Group Interactive Session (LGIS)

| Topics | At the end of lecture students should be able to: | Learning Domains | Teaching Strategy | Assessment Tools | | |
|---|---|---|---|---|---|---|
| Composition of blood & Hemopoiesis | 1.Describe composition and general functions of blood<br>2.Explain the role of bone marrow in hemopoiesis and erythropoiesis<br>3.Draw steps of hemopoiesis<br>4. Define committed and uncommitted cells | 1.C2<br>2. C2<br>3. C3<br>4. C1 | LGIS | MCQ<br>SEQ<br>VIVA VOCE<br>MCQ (LMS based Assessment, MST based Assessment)<br>OSPE | • Ganong's Review of Medical Physiology.25TH Edition. Section05, Cardiovascular Physiology (Chapter 31, Page 553)<br>• Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 16, Page 547,548)<br>• Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 03, Blood (Chapter 19, Page347) (Chapter 20, Page 356)<br>• Textbook of Medical Physiology by Guyton & Hall.14th Edition. Red blood cells, Anemia and Polycythemia. Section 06. (Chapter 33, Page 439) | https://accessmedicine.mhmedical.com/content.aspx?bookid=3047&sectionid=255121548<br>2.https://youtu.be/cm8IK24RRvA |
| Plasma Proteins | 1.Enumerate plasma proteins, their properties, sites of production and their functions.<br>2.Explain effects of deficiency of plasma proteins<br>3.Discuss conditions associated with decreased production and increased excretion of plasma proteins | C1<br>C2<br>C2 | LGIS | MCQ<br>SEQ<br>VIVA VOCE<br>MCQ (LMS based Assessment, MST based Assessment)<br>OSPE | • Ganong's Review of Medical Physiology.25TH Edition. Section05, Cardiovascular Physiology (Chapter 31, Page 563)<br>• Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 16, Page 547)<br>• Physiological Basis of | https://www.ncbi.nlm.nih.gov/books/NBK531504/<br>2.https://accessmedicine.mhmedical.com/content.aspx?bookid=1366&sectionid=73247095348,353) |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | Medical Practice by Best & Taylor's.13th Edition. Section 03, Blood (Chapter 19, Page | |
| WBCs classification & formation. Neutrophils, Eosinophils &Basophils and their properties | 1. Enumerate and explain various types of leukocytes and steps of leucopoiesis.<br>2. Explain the characteristics and functions.<br>3. Conditions in which these cells are increased and decreased.<br>4. Leukemias and their effects on the body | C1/C2<br>C2<br>C2<br>C2 | LGIS | MCQ<br>SEQ<br>VIVA VOCE<br>MCQ (LMS based Assessment, MST based Assessment)<br>OSPE | • Textbook of Medical Physiology by Guyton & Hall.14th Edition. Resistance of the body to Infection. Section 06. (Chapter 34, Page 449,456,457) | https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9777002/<br>2.https://youtu.be/TelOcCkZX7c |
| Stages of erythropoiesis & factors affecting erythropoiesis | 1. Elaborate Morphological features of RBCs.<br>2. Describe the stages of production of RBCs.<br>3. Recall Life span of RBCs<br>4. Enumerate and explain factors which affect erythropoiesis.<br>5. Enlist sites of production of erythropoietin<br>6. Describe recombinant erythropoietin.<br>7. Explain mechanism of release and action of erythropoietin | C2<br>C1<br>C1<br>C2<br>C1<br>C2<br>C2 | LGIS | MCQ<br>SEQ<br>VIVA VOCE<br>MCQ (LMS based Assessment, MST based Assessment)<br>OSPE | • Ganong's Review of Medical Physiology.25TH Edition. Section05, Cardiovascular Physiology (Chapter 31, Page 553)<br>• Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 16, Page 547,548)<br>• Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 03, Blood (Chapter 19, Page347) (Chapter 20, Page 356)<br>• Textbook of Medical Physiology by Guyton & Hall.14th Edition. Red blood cells, Anemia and | https://accessmedicine.mhmedical.com/content.aspx?bookid=3047&sectionid=255121548<br>2.https://youtu.be/cm8IK24RRvA |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | Polycythemia. Section 06. (Chapter 33, Page 439) | |
| Monocytes - macrophage system & lymphocytes | 1. Explain the characteristics and functionsof monocytes.<br>2. Explain monocyte-macrophage system; importance | C2<br>C2 | LGIS | MCQ<br>SEQ<br>VIVA VOCE<br>MCQ (LMS based Assessment, MST based Assessment)<br>OSPE | • Ganong's Review of Medical Physiology.25TH Edition. Section01, Immunity, Infection and Inflammation (Chapter 03, Page 67)<br>• Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 03, Blood (Chapter 21, Page371) (Chapter 22, Page 387)<br>• Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 34, Page 450-452) | https://www.sciencedirect.com/topics/pharmacology-toxicology-and-pharmaceutical-science/mononuclear-phagocyte-system<br>2.https://bmcbiol.biomedcentral.com/articles/10.1186/s12915-017-0392-4 |
| Hemoglobin & Hemoglobinopathies, Iron Metabolism | 1. Discuss details about iron metabolism in body including iron absorption and storage.<br>2. Understand the structure, synthesis and functions of hemoglobin and its types.<br>3. Enlist different types of hemoglobinopathies | C2<br>C2<br>C1 | LGIS | MCQ<br>SEQ<br>VIVA VOCE<br>MCQ (LMS based Assessment, MST based Assessment)<br>OSPE | • Ganong's Review of Medical Physiology.25TH Edition. Section05, (Chapter 31, Page 555)<br>• Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 16, Page 553)<br>• Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 23, Page 407,409)<br>• Textbook of Medical Physiology by Guyton & | https://www.sciencedirect.com/topics/medicine-and-dentistry/red-blood-cell-indices<br>2.https://youtu.be/QUHqYVK-Nhg<br>3. https://youtu.be/mOrRJBqm744 |

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| | | | | | Hall.14th Edition. Section 06. (Chapter 34, Page 446,447) | |
| Process of inflammation and Lines of defense during inflammation | 1. Describe the role of neutrophils and monocytes in inflammation.<br>2. Elaborate Lines of defense | 1.C1, C2<br>2. C1, C2 | LGIS | MCQ<br>SEQ<br>VIVA VOCE<br>MCQ (LMS based Assessment, MST based Assessment)<br>OSPE | • Ganong's Review of Medical Physiology.25TH Edition. Section01, Immunity, Infection and Inflammation (Chapter 03, Page 81)<br>• Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 03, Blood) (Chapter 22, Page 384)<br>• Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 34, Page 454) | https://youtu.be/WFm9j1rNkQs .https://en.wikipedia.org/wiki/Inflammation .https://www.verywellhealth.com/signs-of-inflammation-4580526 |
| Red cell fragility, ESR & Red cell indices, Anemia & polycythemia | 1. Define RBC fragility; importance; conditions in which fragility is changed.<br>2. Discuss various blood indices, give their formulae,co-related with different types of anemias.<br>3. Enumerate various types of anemias and polycythemias.<br>4. DIiscuss details about various types of anemias and polycythemia and their effect on circulatory system. | C1<br>C2<br>C1<br>C2 | LGIS | MCQ<br>SEQ<br>VIVA VOCE<br>MCQ (LMS based Assessment, MST based Assessment)<br>OSPE | • Ganong's Review of Medical Physiology.25THEdition. Section05, (Chapter 31, Page 555)<br>• Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 16, Page 553)<br>• Physiological Basis of Medical Practice by Best & Taylor's.13thEdition. (Chapter 23, Page 407,409)<br>• Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 34, Page | https://www.sciencedirect.com/topics/medicine-and-dentistry/red-blood-cell-indices<br>2.https://youtu.be/QUHqYVK-Nhg<br>3. https://youtu.be/mOrRJBqm744 |

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| | | | | | 446,447) | |
| Platelet formation & function. hemostasis, blood coagulation tests (BT, CT, PT, APTT and INR) | 1. Explain thrombocytopoiesis.<br>2. Describe functions of platelets<br>3. Define hemostasis.<br>4. Explain steps of hemostasis | C2<br>C2<br>C1<br>C2 | LGIS | MCQ<br>SEQ<br>VIVA VOCE<br>MCQ (LMS based Assessment, MST based Assessment)<br>OSPE | • Ganong's Review of Medical Physiology.25TH Edition. Section05, (Chapter 31, Page 564) (Chapter 03, Page 79)<br>• Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 16, Page 558)<br>• Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 24, Page 413)<br>• Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 37, Page 477,487) | https://my.clevelandclinic.org/health/symptoms/21999-hemostasis<br>https://www.sciencedirect.com/topics/neuroscience/hemostasis |
| Fate of RBCs & Jaundice | 1. Give life span of RBCs and explain their destruction.<br>2. Describe various types, compare and differentiate between various types of jaundice | C1, C2<br>C1, C2 | LGIS | MCQ<br>SEQ<br>VIVA VOCE<br>MCQ (LMS based Assessment, MST based Assessment)<br>OSPE | • Ganong's Review of Medical Physiology.25$^{TH}$Edition. Section05, (Chapter 31, Page 555)<br>• Human Physiology by Dee Unglaub Silver thorn. 8$^{TH}$ Edition. (Chapter 16, Page 553)<br>• Physiological Basis of Medical Practice by Best & Taylor's.13$^{th}$Edition. (Chapter 23, Page 407,409)<br>• Textbook of Medical | https://www.sciencedirect.com/topics/medicine-and-dentistry/red-blood-cell-indices<br>2.https://youtu.be/QUHqYVK-Nhg<br>3. https://youtu.be/mOrRJBqm744 |

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| | | | | | Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 34, Page 446,447) | |
| Blood coagulation | 1. Explain hemostasis, mechanism of blood coagulation, fibrinolysis and anticoagulants | C2 | LGIS | MCQ<br>SEQ<br>VIVA VOCE<br>MCQ (LMS based Assessment, MST based Assessment)<br>OSPE | • Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 16, Page 559)<br>• Physiological Basis of Medical Practice by Best & Taylor's.13thEdition. (Chapter 24, Page 417)<br>• Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 37, Page 479) | https://youtu.be/gExUCrpAKyQ<br>https://medlineplus.gov/lab-tests/coagulation-factor-tests/ |
| Types of immunity, Physiology of innate immunity tolerance & auto immunity | 1. Define immunity and its types.<br>2. Compare and contrast innate and acquired immunity.<br>3. Difference between passive and active immunity | C1<br>C2<br>C2 | LGIS | MCQ<br>SEQ<br>VIVA VOCE<br>MCQ (LMS based Assessment, MST based Assessment)<br>OSPE | • Ganong's Review of Medical Physiology.25THEdition. Section01, Immunity, Infection and Inflammation (Chapter 03, Page 67)<br>• Physiological Basis of Medical Practice by Best & Taylor's.13thEdition. Section 03, Blood (Chapter 21, Page371) (Chapter 22, Page 387)<br>• Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 34, Page 450-452) | https://www.sciencedirect.com/topics/pharmacology-toxicology-and-pharmaceutical-science/mononuclear-phagocyte-system<br>2.https://bmcbiol.biomedcentral.com/articles/10.1186/s12915-017-0392-4 |
| Concept of intravascular anticoagulants and bleeding disorders (Vit | 1. Explain Intravascular coagulation.<br>2. Discuss Bleeding disorders.<br>3. Enlist Types of hemophilia | 1.C2<br>2.C2<br>3. C1 | LGIS | MCQ<br>SEQ<br>VIVA VOCE | • Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 16, Page 559) | https://youtu.be/gExUCrpAKyQ<br>https://medlineplus.gov/lab-tests/coagulation-factor-tests/ |

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| K deficiency, hemophilia and thrombocytopenia) | | | | MCQ (LMS based Assessment, MST based Assessment) OSPE | • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 24, Page 417)<br>• Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 37, Page 479) | |
| Physiology of acquired immunity B-Cells | 1. Enumerate various types of lymphocytes<br>2. Discuss their important characteristics and<br>3. Explain the mechanism of preprocessing | C1<br>C2<br>C2 | LGIS | MCQ<br>SEQ<br>VIVA VOCE<br>MCQ (LMS based Assessment, MST based Assessment) OSPE | • Ganong's Review of Medical Physiology.25TH Edition. Section01, Immunity, Infection and Inflammation (Chapter 03, Page 67)<br>• Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 03, Blood (Chapter 21, Page371) (Chapter 22, Page 387)<br>• Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 34, Page 450-452) | https://www.sciencedirect.com/topics/pharmacology-toxicology-and-pharmaceutical-science/mononuclear-phagocyte-system<br>2.https://bmcbiol.biomedcentral.com/articles/10.1186/s12915-017-0392-4 |
| Thromboembolic condition (DVT, Pulmonary Embolism, DIC)<br>Anticoagulant therapy (Heparin, warfarin, Prevention of blood clotting outside the body) | • Discuss different Thromboembolic Conditions<br>• Explain Pulmonary Embolism and clinical correlation<br>• Enlist different Anticoagulant therapy | C2<br>C2<br>C1 | LGIS | MCQ<br>SEQ<br>VIVA VOCE<br>MCQ (LMS based Assessment, MST based Assessment) OSPE | • Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 16, Page 559)<br>• Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 24, Page 417)<br>• Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 37, Page 479) | https://youtu.be/gExUCrpAKyQ<br>https://medlineplus.gov/lab-tests/coagulation-factor-tests/ |

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| Physiology of acquired immunity T-Cells. Allergy and Hypersensitivity reactions, Auto-immune diseases and AIDS | 1. Define clone and explain the roles of T and B lymphocyte clones in immunity<br>2. Discuss the mechanisms involved in Immune Tolerance<br>3. Compare Type I and Type IV hypersensitivity reactions<br>4. Describe the process of immunization<br>5. Understand role of T-lymphocytes in transplants<br>6. Identify different types of tissue grafts | C1, C2<br>C2<br>C2<br>C1<br>C2<br>C1 | LGIS | MCQ<br>SEQ<br>VIVA VOCE<br>MCQ (LMS based Assessment, MST based Assessment)<br>OSPE | • Ganong's Review of Medical Physiology.25TH Edition. Section01, Immunity, Infection and Inflammation (Chapter 03, Page 67)<br>• Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 03, Blood (Chapter 21, Page371) (Chapter 22, Page 387)<br>• Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 34, Page 450-452) | https://www.sciencedirect.com/topics/pharmacology-toxicology-and-pharmaceutical-science/mononuclear-phagocyte-system<br>2.https://bmcbiol.biomedcentral.com/articles/10.1186/s12915-017-0392-4 |
| Physiological mechanism of temperature regulation | 1. Explain Concept of temperature<br>2. Discuss Physiological mechanism of temperature regulation | C2<br>C2 | LGIS | MCQ<br>SEQ<br>VIVA VOCE<br>MCQ (LMS based Assessment, MST based Assessment)<br>OSPE | • Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 73, Page 889-936) | **https://shop.elsevier.com/books/guyton-and-hall-textbook-of-medical-physiology/hall/978-0-323-59712-8** |
| ABO & Rh Blood grouping system | 1. Enlist Blood group and its types<br>2. Explain Rh Blood Grouping System | C1<br>C2 | LGIS | MCQ<br>SEQ<br>VIVA VOCE<br>MCQ (LMS based Assessment, MST based Assessment)<br>OSPE | • Ganong's Review of Medical Physiology.25TH Edition. Section05, (Chapter 31, Page 558) (Chapter 36, Page 473)<br>• Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 25, Page 432)<br>• Textbook of Medical Physiology by Guyton & | https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/abo-blood-group-system<br>https://youtu.be/wfqnNuYIY78 |

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| | | | | | Hall.14th Edition. Section 06. (Chapter 36, Page 471) | |
| Role of Hypothalamus in temperature regulation | 1. Discuss Role of Hypothalamus in temperature regulation<br>2. Explain Temperature Regulating centers | C2<br>C2 | LGIS | MCQ<br>SEQ<br>VIVA VOCE<br>MCQ (LMS based Assessment, MST based Assessment)<br>OSPE | • Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 73, Page 889-936) | **https://shop.elsevier.com/books/guyton-and-hall-textbook-of-medical-physiology/hall/978-0-323-59712-8** |
| Rh Blood grouping system and Erythroblastosis fetalis | 1. Discuss Rh Blood Grouping System<br>2. Explain Erythroblastosis fetalis<br>3. Discuss Clinical correlation | C2<br>C2<br>C2 | LGIS | MCQ<br>SEQ<br>VIVA VOCE<br>MCQ (LMS based Assessment, MST based Assessment)<br>OSPE | • Ganong's Review of Medical Physiology.25TH Edition. Section05, (Chapter 31, Page 558) (Chapter 36, Page 473)<br>• Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 25, Page 432)<br>• Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 36, Page 471) | https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/abo-blood-group-system<br><br>https://youtu.be/wfqnNuYIY78 |
| Disorders of temperature regulation (Fever, Heat stroke, Exposure of body to extreme cold) | 1. Discuss Disorders of temperature regulation<br>2. Explain Concept of Fever<br>3. Clinical correlation Of Heat Stroke | 1.C2<br>2.C2<br>3.C3 | LGIS | MCQ<br>SEQ<br>VIVA VOCE<br>MCQ (LMS based Assessment, MST based Assessment)<br>OSPE | • Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 73, Page 889-936) | **https://shop.elsevier.com/books/guyton-and-hall-textbook-of-medical-physiology/hall/978-0-323-59712-8** |

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| Blood transfusion hazards.<br>Tissue and organ transplantations | 1. Discuss Blood transfusion hazards.<br>2. Explain Effect of blood transfusion on various organs<br>3. Explain Tissue and organ transplantations | C2<br>C2<br>C2 | LGIS | MCQ<br>SEQ<br>VIVA VOCE<br>MCQ (LMS based Assessment, MST based Assessment)<br>OSPE | • Ganong's Review of Medical Physiology.25TH Edition. Section05, (Chapter 31, Page 558) (Chapter 36, Page 473)<br>• Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 25, Page 432)<br>• Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 36, Page 471) | https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/abo-blood-group-system<br>https://youtu.be/wfqnNuYIY78 |

## Biochemistry Large Group Interactive Session (LGIS)

| Topics | At the end of lecture students should be able to | Learning Domain | Teaching Strategy | Assessment Tool |
|---|---|---|---|---|
| Blood | • Enlist various functions performed by blood. | C1 | LGIS | MCQs SAQs |
| | • Describe Composition of blood. | C2 | | |
| Structure of hemoglobin and myoglobin | • Describe Structure of hemoglobin | C2 | LGIS | MCQs SAQs |
| | • Describe structure of myoglobin. | C2 | | |
| | • Discuss Biochemical roles of hemoglobin and myoglobin. | C2 | | |
| Types of Hemoglobin | • Enlist various types of Hemoglobin. | C1 | LGIS | MCQs SAQs |
| | • Describe Importance of heme and globin components | C2 | | |
| | • Interpret importance of HbA1c in diagnosis of Diabetes | C3 | | |
| Oxygen dissociation curve. | • Discuss Importance of oxygen dissociation curve. | C2 | LGIS | MCQs SAQs |
| | • Enlist various factors affecting the curve. | C1 | | |
| Abnormalities in Hemoglobin. | • Elaborate congenital abnormalities in structure of Hemoglobin. | C2 | LGIS | MCQs SAQs |
| | • Enlist Structural defects of hemoglobin | C1 | | |
| | • Discuss Preventive measures. | C2 | | |
| Hemoglobinopathies | • Discuss hemoglobinopathies. | C2 | LGIS | MCQs SAQs |
| | • Enlist Types of thalassemia. | C1 | | |
| | • Discuss Familial counseling. | C2 | | |
| | • Elaborate Preventive measures. | C2 | | |
| Heme synthesis | • Describe enzymatic regulation of heme synthesis | C2 | LGIS | MCQs SAQs |
| Porphyria | • Discuss various types of porphyria | C2 | | |
| Breakdown of hemoglobin | • Elaborate steps in the breakdown of hemoglobin. | C2 | LGIS | MCQs SAQs |
| | • Describe Steps in synthesis of Bilirubin | C2 | | |
| Jaundice. | • Recall Normal level of S. Bilirubin. | C1 | | |
| | • Define jaundice. | C1 | LGIS | MCQs SAQs |
| | • Recall normal level of Bilirubin | C1 | | |
| | • Enlist types of Jaundice. | C1 | | |

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| | • Describe Biochemical tests to distinguish various types of jaundice. | C2 | LGIS | |
| | • . Describe Physiological Jaundice | C2 | | |
| Plasma proteins | • Describe plasma proteins. | C2 | LGIS | MCQs SAQs |
| | • Discuss Biochemical role of various plasma proteins. | C2 | | |
| | • Recall normal levels of plasma proteins | C1 | | |
| | • Illustrate Role of A/G ratio. | C3 | | |
| Acute phase proteins & Albumin | • Enlist various proteins raise in inflammation. | C1 | LGIS | MCQs SAQs |
| | • Describe Role of albumin. | C2 | | |
| | • Discuss Role of C- reactive protein. | C2 | | |
| Haptoglobin and transferring | • Describe Structure of Haptoglobin and transferrin. | C2 | LGIS | MCQs SAQs |
| | • Discuss biochemical Role of Haptoglobin and transferrin. | C2 | | |
| Ferritin and hemosiderin | • Describe biochemical role of ferritin and hemosiderin. | C2 | LGIS | MCQs SAQs |
| | • Describe Hemosiderosis. | C2 | | |
| Ceruloplasmin. | • Describe biochemical role of ceruloplasmin. | C2 | LGIS | MCQs SAQs |
| | • Discuss Wilson's disease. | C2 | | |
| Iron | • Recall Sources of iron. | C1 | LGIS | MCQs SAQs |
| | • Describe Transport and absorption of iron. | C2 | | |
| | • Discuss hyper and hypo functions of iron. | C2 | | |
| Immunoglobulins | • Describe Structure of Immunoglobulin. | C2 | LGIS | MCQs SAQs |
| | • Discuss biochemical role of various Immunoglobulin. | C2 | | |
| | • Elaborate Class switching. | C2 | | |
| AIDs | • Define AIDs | C1 | LGIS | MCQs SAQs |
| | • Describe Immunological defects in AIDs. | C2 | | |
| | • Discuss various preventive measures. | C2 | | |
| Folic acid. | • Recall Sources of folic acid. | C1 | LGIS | MCQs SAQs |
| | • Discuss deficiency effects of folic acid | C2 | | |
| | • Describe biochemical role of folic acid. | C2 | | |
| | • Recall Recommended Dietary allowance. | C1 | | |
| Vitamin B12 | • Recall Sources of Vitamin B12 | C1 | LGIS | MCQs SAQs |
| | • Describe biochemical role of vitamin B12 | C2 | | |
| | • Discuss Deficiency effects of B12 | C2 | | |

## Anatomy Small Group Discussion (SGDs)

| Topic | At the End Of The Session Students Should Be Able To: | Learning Domains | Teaching Strategy | Assessment Tools |
|---|---|---|---|---|
| Posterior Compartment of Leg (muscles) and flexor retinaculum | • Illustrate cutaneous innervation | C2 | SGD, Skill Lab | MCQ SAQ VIVA OSPE |
| | • Describe superficial fascia & deep fascia. | C2 | | |
| | • Discuss superficial and deep muscle groups in posterior compartment | C2 | | |
| | • Tabulate origin, insertion, nerve supply and action of all muscles of posterior compartment of leg | C2 | | |
| | • Discuss ruputured calcaneal tendon, calcaneal bursitis and accessory soleus muscle | C3 | | |
| | • Correlate the clinical conditions | C3 | | |
| | • Understand the preventive and curative health care measures | C3 | | |
| | • Practice the principles of Bioethics | C3 | | |
| | • Apply strategic use of AI in health care | C3 | | |
| | • Read a research article | C3 | | |
| Posterior Compartment of Leg (Neurovascular organization) | • Describe origin, course relations, branches and tributaries of neurovascular bundle | C2 | SGD, Skill Lab | MCQ SAQ VIVA OSPE |
| | • Discuss superficial veins i.e long and short saphenous veins | C2 | | |
| | • Palpate the posterior tibial pulse | C3 | | |
| | • Correlate the clinical conditions | C3 | | |
| | • Understand the preventive and curative health care measures | C3 | | |
| | • Practice the principles of Bioethics | C3 | | |
| | • Apply strategic use of AI in health care | C3 | | |
| | • Read a research article | C3 | | |
| Bones of Foot | • Enumerate the bones of foot | C1 | SGD, Skill Lab | MCQ SAQ VIVA OSPE |
| | • Identify different bones of foot | C1 | | |
| | • Discuss bony features and muscle attachment | C2 | | |
| | • Discuss fracture of metatarsals and os trigonum, avascular necrosis of head of talus | C3 | | |
| | • Correlate the clinical conditions | C3 | | |
| | • Understand the preventive and curative health care measures | C3 | | |
| | • Practice the principles of Bioethics | C3 | | |

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| | • Apply strategic use of AI in health care | C3 | | |
| | • Read a research article | C3 | | |
| Dorsum of foot | • Tabulate muscle on the dorsal aspect of foot | C2 | SGD, Skill Lab | MCQ SAQ VIVA OSPE |
| | • Describe blood supply and nerve supply | C2 | | |
| | • Discuss cutaneous innervation of dorsum of foot | C2 | | |
| | • Palpate the dorsalis pedis artery on dorsum of foot | C3 | | |
| | • Discuss other clinicals related to the dorsum of the foot | C3 | | |
| | • Correlate the clinical conditions | C3 | | |
| | • Understand the preventive and curative health care measures | C3 | | |
| | • Practice the principles of Bioethics | C3 | | |
| | • Apply strategic use of AI in health care | C3 | | |
| | • Read a research article | C3 | | |
| Ankle Joint | • Describe the articular surfaces of ankle joint | C2 | Skill Lab | MCQ SAQ VIVA OSPE |
| | • Describe the attachment of capsule | C2 | | |
| | • Enumerate the ligaments | C1 | | |
| | • Discuss the movements possible at ankle joint and muscles producing them | C2 | | |
| | • Discuss ankle sprain | C3 | | |
| | • Discuss different types of ankle injuries | C3 | | |
| | • Correlate the clinical conditions | C3 | | |
| | • Understand the preventive and curative health care measures | C3 | | |
| | • Practice the principles of Bioethics | C3 | | |
| | • Apply strategic use of AI in health care | C3 | | |
| | • Read a research article | C3 | | |
| Joints of Foot | • Classify the joints of foot | C2 | SGD, Skill Lab | MCQ SAQ VIVA OSPE |
| | • Discuss the articular surfaces, joint capsules, ligaments, movements and muscles producing movements | C2 | | |
| | • Discuss major ligaments in detail | C2 | | |
| | • Discuss tibial nerve entrapment | C3 | | |
| | • Discuss club foot, claw foot and other clinical conditions | C3 | | |
| | • Correlate the clinical conditions | C3 | | |
| | • Understand the preventive and curative health care measures | C3 | | |
| | • Practice the principles of Bioethics | C3 | | |
| | • Apply strategic use of AI in health care | C3 | | |

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| | • Read a research article | C3 | | |
| Sole of foot (Muscles) | • Identify Surface landmarks | C1 | SGD, Skill Lab | MCQ SAQ VIVA OSPE |
| | • Describe cutaneous innervation of sole of foot | C2 | | |
| | • Describe Plantar aponeurosis its attachments | C2 | | |
| | • Discuss flexor retinaculum | C2 | | |
| | • Discuss muscles in different layers of foot with origin, insertion, nerve supply and actions | C2 | | |
| | • Correlate the clinical conditions | C3 | | |
| | • Understand the preventive and curative health care measures | C3 | | |
| | • Practice the principles of Bioethics | C3 | | |
| | • Apply strategic use of AI in health care | C3 | | |
| | • Read a research article | C3 | | |
| Sole of foot (Neurovascular Organization) | • Enlist nerves and arteries present in sole of foot | C1 | SGD, Skill Lab | MCQ SAQ VIVA OSPE |
| | • Discuss route and relations of neurovascular bundle in sole of foot | C2 | | |
| | • Describe the formation of vascular arches of foot along with clinicals | C2, C3 | | |
| | • Discuss plantar fasciitis | C3 | | |
| | • Correlate the clinical conditions | C3 | | |
| | • Understand the preventive and curative health care measures | C3 | | |
| | • Practice the principles of Bioethics | C3 | | |
| | • Apply strategic use of AI in health care | C3 | | |
| | • Read a research article | C3 | | |
| Arches of Foot and Gait Cycle | • Classify the arches of foot | C2 | SGD, Skill Lab | MCQ SAQ VIVA OSPE |
| | • Describe different components of arches of foot | C2 | | |
| | • Discuss stability factors of arches of foot | C2 | | |
| | • Discuss pes planus (flat foot), club foot and other clinicals | C3 | | |
| | • Discuss gait cycle and its stages | C2 | | |
| | • Correlate the clinical conditions | C3 | | |
| | • Understand the preventive and curative health care measures | C3 | | |
| | • Practice the principles of Bioethics | C3 | | |
| | • Apply strategic use of AI in health care | C3 | | |
| | • Read a research article | C3 | | |
| Thymus, Tonsils | • Describe location of thymus and tonsils | C2 | | MCQ |
| | • Discuss anatomical features of thymus and tonsils | C2 | | |

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|---|---|---|---|---|
| | • Describe blood supply, venous drainage and lymphatic drainage of thymus and tonsils | C2 | SGD, Skill Lab | SAQ VIVA OSPE |
| | • Enumerate functions of thymus and tonsils | C1 | | |
| | • Correlate the clinical conditions | C3 | | |
| | • Understand the preventive and curative health care measures | C3 | | |
| | • Practice the principles of Bioethics | C3 | | |
| | • Apply strategic use of AI in health care | C3 | | |
| | • Read a research article | C3 | | |
| Spleen | • Discuss the location of spleen | C2 | SGD, Skill Lab | MCQ SAQ VIVA OSPE |
| | • Enumerate anatomical relations of spleen | C1 | | |
| | • Discuss blood supply, venous drainage and lymphatic drainage of spleen | C2 | | |
| | • Correlate the clinical conditions | C3 | | |
| | • Understand the preventive and curative health care measures | C3 | | |
| | • Practice the principles of Bioethics | C3 | | |
| | • Apply strategic use of AI in health care | C3 | | |
| | • Read a research article | C3 | | |
| Radiology, Surface Anatomy & Cross Sectional Anatomy | • Identify different structures on radiographs | C3 | SGD, Skill Lab | MCQ SAQ VIVA OSPE |
| | • Demonstrate the surface anatomy of various structures present in posterior compartment of leg and foot | P | | |
| | • Demonstrate the surface anatomy of spleen, thymus and tonsils | P | | |
| | • Discuss the Cross-Sectional anatomy at the level of leg & foot | C2 | | |
| | • Correlate the clinical conditions | C3 | | |
| | • Understand the preventive and curative health care measures | C3 | | |
| | • Practice the principles of Bioethics | C3 | | |
| | • Apply strategic use of AI in health care | C3 | | |
| | • Read a research article | C3 | | |

## Physiology Small Group Discussion (SGDs)

| Topics | At the end of discussion students should be able to: | Learning Domains | Teaching Strategy | Assessment Tools |
|---|---|---|---|---|
| Functions & composition of blood, Hemopoiesis and Bone marrow | 1.Describe composition and general functions of blood<br>2.Explain the role of bone marrow in hemopoiesis and erythropoiesis<br>3.Draw steps of hemopoiesis<br>4. Define committed and uncommitted cells<br>5.Correlate basic knowledge with clinical application | 1.C2<br>2. C2<br>3. C3<br>4. C1<br>5.C3 | SGD | MCQ<br>SEQ<br>VIVA VOCE<br>MCQ (LMS based Assessment, MST based Assessment)<br>OSPE |
| Hemoglobin & Hemoglobinopathies, Iron Metabolism | 1. Discuss details about iron metabolism in body including iron absorption and storage<br>2. Understand the structure, synthesis and functions of hemoglobin and its types<br>3. Enlist different types of hemoglobinopathies<br>4. Correlate basic knowledge with clinical application | C2<br>C2<br>C1<br>C3 | SGD | MCQ<br>SEQ<br>VIVA VOCE<br>MCQ (LMS based Assessment, MST based Assessment)<br>OSPE |
| Platelet formation & function. hemostasis, blood coagulation tests (BT, CT, PT, APTT and INR) | 1. Explain thrombocytopenia<br>2. Describe functions of platelets<br>3. Define hemostasis<br>4. Explain steps of hemostasis<br>5. Correlate basic knowledge with clinical application | C2<br>C2<br>C1<br>C2<br>C3 | SGD | MCQ<br>SEQ<br>VIVA VOCE<br>MCQ (LMS based Assessment, MST based Assessment)<br>OSPE |
| Physiological mechanism of temperature regulation | 1. Explain Concept of temperature<br>2. Discuss Physiological mechanism of temperature regulation<br>3. Correlate basic knowledge with clinical application | C2<br>C2<br>C3 | SGD | MCQ<br>SEQ<br>VIVA VOCE<br>MCQ (LMS based Assessment, MST based Assessment)<br>OSPE |
| Stages of Erythropoiesis Factors | 1. Elaborate Morphological features of RBCs<br>2. Describe the stages of production of RBCs<br>3. Recall Life span of RBCs | C2<br>C1<br>C1<br>C2 | SGD | MCQ<br>SEQ<br>VIVA VOCE |

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|---|---|---|---|---|
| Affecting Erythropoiesis (First week) | 4. Enumerate and explain factors which affect erythropoiesis<br>5. Enlist sites of production of erythropoietin<br>6. Describe recombinant erythropoietin<br>7. Explain mechanism of release and action of erythropoietin | C1<br>C2<br>C2 | | MCQ (LMS based Assessment, MST based Assessment)<br>OSPE |
| Physiology of WBC (third week) | 1. Enumerate and explain various types of leukocytes and steps of leucopoiesis<br>2. Explain the characteristics and functions<br>3. Conditions in which these cells are increased and decreased<br>4. Leukemias and their effects on the body | C1/C2<br>C2<br>C2<br>C2 | SGD | MCQ<br>SEQ<br>VIVA VOCE<br>MCQ (LMS based Assessment, MST based Assessment)<br>OSPE |
| Physiology of platelets (Fourth week) | 1. Explain thrombocytopenia<br>2. Describe functions of platelets<br>3. Define hemostasis<br>4. Explain steps of hemostasis | C2<br>C2<br>C1<br>C2 | SGD | MCQ<br>SEQ<br>VIVA VOCE<br>MCQ (LMS based Assessment, MST based Assessment)<br>OSPE |
| Blood transfusion hazards. Tissue and organ transplantations (Fifth week) | 1. Discuss Blood transfusion hazards.<br>2. Explain Effect of blood transfusion on various organs<br>3. Explain Tissue and organ transplantations | C2<br>C2<br>C2 | SGD | MCQ<br>SEQ<br>VIVA VOCE<br>MCQ (LMS based Assessment, MST based Assessment)<br>OSPE |
| Disorders of temperature regulation (Fever, Heat stroke, Exposure of body to extreme cold) (Fifth week) | 1. Discuss Disorders of temperature regulation<br>2. Explain Concept of Fever<br>3. Clinical correlation Of Heat Stroke | 1.C2<br>2.C2<br>3.C3 | SGD | MCQ<br>SEQ<br>VIVA VOCE<br>MCQ (LMS based Assessment, MST based Assessment)<br>OSPE |

## Biochemistry Small Group Discussion (SGDs)

| Topic | At the End of Tutorial Students Should Be Able To | Learning Domain | Teaching Strategy | Assessment Tool |
|---|---|---|---|---|
| Blood | • Explain structure and biomedical role of hemoglobin & Myoglobin | C2 | SGD | MCQs, SAQs Viva |
| | • Describe oxygen dissociation curve and its significance. | C2 | | |
| | • Types of Hb | C1 | | |
| Iron | • Describe sources, structure, Biochemical role and related diseases of iron. | C2 | SGD | MCQs, SAQs Viva |

## Anatomy Self-Directed Learning (SDL)

| Topics | Learning objectives | Learning Resources |
|---|---|---|
| Posterior compartment of leg and flexor retinaculum | • Illustrate cutaneous innervation<br>• Describe superficial fascia & deep fascia.<br>• Discuss superficial and deep muscle groups in posterior compartment<br>• Tabulate origin, insertion, nerve supply and action of all muscles of posterior compartment of leg<br>• Discuss ruptured calcaneal tendon, calcaneal bursitis and accessory soleus muscle<br>• Correlate the clinical aspects<br>• Read relevant research article<br>• Use digital library | • Clinically Oriented Anatomy 9th Edition, **pg no.755**<br>• https://www.youtube.com/watch?v=Bj4c7wGdIwc&pp=ygUTY29tcGFydG1lbnRzIG9mIGxlZw%3D%3D<br>• https://www.sciencedirect.com/science/article/abs/pii/S1440244004800343<br>• |
| Neurovascular organization of posterior compartment of leg | • Describe origin, course relations, branches and tributaries of neurovascular bundle<br>• Discuss superficial veins i.e long and short saphenous veins<br>• Palpate the posterior tibial pulse<br>• Discuss clinical correlation related to venous return in leg<br>• Correlate the clinical aspects<br>• Read relevant research article<br>• Use digital library | • Clinically Oriented Anatomy 9th Edition, **pg no. 755**<br>• https://www.youtube.com/watch?v=Bj4c7wGdIwc&pp=ygUTY29tcGFydG1lbnRzIG9mIGxlZw%3D%3D<br>• https://www.mdpi.com/2077-0383/11/21/6448 |
| Foot Joints | • Classify the joints of foot<br>• Discuss the articular surfaces, joint capsules, ligaments, movements and muscles producing movements<br>• Discuss major ligaments in detail<br>• Discuss tibial nerve entrapment<br>• Discuss club foot, claw foot and other clinical conditions<br>• Correlate the clinical aspects<br>• Read relevant research article<br>• Use digital library | • Clinically Oriented Anatomy 9th Edition, **pg no. 808**<br>• https://www.youtube.com/watch?v=Ex9KzkAYN-8&pp=ygUKZm9vdCBqb2ludA%3D%3D<br>• https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3180294/ |

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| Ankle joint | • Describe the attachment of capsule<br>• Enumerate the ligaments<br>• Discuss the movements possible at ankle joint and muscles producing them<br>• Discuss ankle sprain<br>• Discuss different types of ankle injuries<br>• Correlate the clinical aspects<br>• Read relevant research article<br>• Use digital library | • Clinically Oriented Anatomy 9th Edition, **pg no. 806**<br>• https://www.youtube.com/watch?v=Ex9KzkAYN-8&pp=ygUKZm9vdCBqb2ludA%3D%3D<br>• https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3414868/ |
| Sole of foot | • Identify Surface landmarks<br>• Describe cutaneous innervation of sole of foot<br>• Describe Plantar aponeurosis its attachments<br>• Discuss flexor retinaculum<br>• Discuss muscles in different layers of foot with origin, insertion, nerve supply and actions<br>• Correlate the clinical aspects<br>• Read relevant research article<br>• Use digital library | • Clinically Oriented Anatomy 9th Edition, **pg no. 768-781**<br>• https://www.youtube.com/watch?v=JorGDBbPzI&pp=ygUcc29sZSBvZiBmb290IGFuYXRvbXkgbGVjdHVyZQ%3D%3D<br>• https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3311689/ |
| Spleen | • Discuss the location of spleen<br>• Enumerate anatomical relations of spleen<br>• Discuss blood supply, venous drainage and lymphatic drainage of spleen<br>• Discuss clinical correlations of spleen with special reference to splenectomy<br>• Correlate the clinical aspects<br>• Read relevant research article<br>• Use digital library | • Clinically Oriented Anatomy 9th Edition, **pg no. 487**<br>• https://www.youtube.com/watch?v=3K5I6MMDA8M&pp=ygUOc3BsZWVuIGFuYXRvbXk%3D<br>• https://www.sciencedirect.com/science/article/pii/S0046817782802232 |
| Gait cycle | • Define the gait cycle<br>• Discuss the stages of gait cycle<br>• Correlate the clinical aspects<br>• Read relevant research article<br>• Use digital library | • Clinically Oriented Anatomy 9th Edition, **pg no. 701, 768-781**<br>• https://www.youtube.com/watch?v=1u6d1CX7o9c&pp=ygUXZ2FpdCBjeWNsZSBiaW9tZWNoYW5pY3M%3D<br>• https://www.sciencedirect.com/topics/engineering/gait-cycle |

## Physiology Self-Directed Learning (SDL)

| Topics Of SDL | Learning Objectives | Learning Resources |
|---|---|---|
| ON CAMPUS<br>Platelet formation & function. hemostasis, blood coagulation tests (BT, CT, PT, APTT and INR) | 1. Explain thrombocytopenia<br>2. Describe functions of platelets<br>3. Define hemostasis<br>• Explain steps of hemostasis | • Ganong's Review of Medical Physiology.25TH Edition. Section 05, (Chapter 31, Page 564) (Chapter 03, Page 79)<br>• Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 16, Page 558)<br>• Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 24, Page 413)<br>• Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 37, Page 477,487)<br>• https://my.clevelandclinic.org/health/symptoms/21999-hemostasis<br>• https://www.sciencedirect.com/topics/neuroscience/hemostasis |
| Concept of intravascular anticoagulants and bleeding disorders (Vit K deficiency, hemophilia and thrombocytopenia) | 1. Explain Intravascular coagulation<br>2. Discuss Bleeding disorders<br>• Enlist Types of hemophilia | • Ganong's Review of Medical Physiology.25TH Edition. Section 05, (Chapter 31, Page 566)<br>• Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 24, page 427)<br>• Textbook of Medical Physiology by Guyton & Hall.14th Edition. (Chapter 37, Page 484)<br>• https://youtu.be/unp3vGsxlIA<br>• https://www.hematology.org/education/patients/bleeding-disorders |
| (OFF CAMPUS):<br>Composition of blood | 1.Describe composition and general functions of blood<br>2.Explain the role of bone marrow in hemopoiesis and erythropoiesis<br>3.Draw steps of hemopoiesis<br>• 4. Define committed and uncommitted cells | • Ganong's Review of Medical Physiology.25TH Edition. Section 05, Cardiovascular Physiology (Chapter 31, Page 553)<br>• Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 16, Page 547,548)<br>• Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 03, Blood (Chapter 19, Page 347) (Chapter 20, Page 356)<br>• Textbook of Medical Physiology by Guyton & Hall.14th Edition. Red blood cells, Anemia and Polycythemia. Section 06. (Chapter 33, Page 439)<br>1. https://accessmedicine.mhmedical.com/content.aspx?bookid=3047&sectionid=255121548<br>• 2.https://youtu.be/cm8IK24RRvA |

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| Function of Plasma Proteins | 1.Enumerate plasma proteins, their properties, sites of productions and their functions<br>2.Explain effects of deficiency of plasma proteins<br>• 3.Discuss conditions associated with decreased production and increased excretion of plasma proteins | • Ganong's Review of Medical Physiology.25TH Edition. Section 05, Cardiovascular Physiology (Chapter 31, Page 563)<br>• Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 16, Page 547)<br>• Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 03, Blood (Chapter 19, Page 348,353)<br>1. https://www.ncbi.nlm.nih.gov/books/NBK531504/<br>2.https://accessmedicine.mhmedical.com/content.aspx?bookid=1366&sectionid=73247095 |
| WBCs classification & formation. Neutrophils, Eosinophils & Basophils and their properties | Enumerate and explain various types of leukocytes and steps of leucopoiesis<br>Explain the characteristics and functions<br>Conditions in which these cells are increased and decreased<br>• Leukemias and their effects on the body | • Textbook of Medical Physiology by Guyton & Hall.14th Edition. Resistance of the body to Infection. Section 06. (Chapter 34, Page 449,456,457)<br>1. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9777002/<br>2.https://youtu.be/TelOcCkZX7c |
| Monocytes - macrophage system & lymphocytes | Explain the characteristics and functions of monocytes.<br>• Explain monocyte-macrophage system; importance | • Ganong's Review of Medical Physiology.25TH Edition. Section 01, Immunity, Infection and Inflammation (Chapter 03, Page 67)<br>• Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 03, Blood (Chapter 21, Page 371) (Chapter 22, Page 387)<br>• Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 34, Page 450-452)<br>1. https://www.sciencedirect.com/topics/pharmacology-toxicology-and-pharmaceutical-science/mononuclear-phagocyte-system<br>2.https://bmcbiol.biomedcentral.com/articles/10.1186/s12915-017-0392-4 |
| Process of inflammation and Lines of defense during inflammation | 1. Describe the role of neutrophils and monocytes in inflammation<br>• Elaborate Lines of defense | • Ganong's Review of Medical Physiology.25TH Edition. Section 01, Immunity, Infection and Inflammation (Chapter 03, Page 81)<br>• Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 03, Blood) (Chapter 22, Page 384)<br>• Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 34, Page 454) |

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| | | 1. https://youtu.be/WFm9j1rNkQs<br>2. .https://en.wikipedia.org/wiki/Inflammation<br>3. .https://www.verywellhealth.com/signs-of-inflammation-4580526 |
| Red cell fragility, ESR & Red cell indices, Anemia & polycythemia | 1. Define RBC fragility; importance; conditions in which fragility is changed.<br>2. Discuss various blood indices, give their formulae, co-relate with different types of anemias.<br>3. Enumerate various types of anemias and polycythemias.<br>• Discuss details about various types of anemias and polycythemia and their effect on circulatory system. | 1. Ganong's Review of Medical Physiology.25TH Edition. Section 05, (Chapter 31, Page 555)<br>2. Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 16, Page 553)<br>3. Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 23, Page 407,409)<br>4. Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 34, Page 446,447)<br>1. https://www.sciencedirect.com/topics/medicine-and-dentistry/red-blood-cell-indices<br>2.https://youtu.be/QUHqYVK-Nhg<br>3. https://youtu.be/mOrRJBqm744 |
| Blood coagulation | • Explain hemostasis, mechanism of blood coagulation, fibrinolysis and anticoagulants | 1. Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 16, Page 559)<br>2. Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 24, Page 417)<br>3. Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 37, Page 479)<br>1. https://youtu.be/gExUCrpAKyQ<br>2. https://medlineplus.gov/lab-tests/coagulation-factor-tests/ |
| ABO & Rh Blood grouping system | • Blood group and its types Rh Blood Grouping System | • Ganong's Review of Medical Physiology.25TH Edition. Section 05, (Chapter 31, Page 558) (Chapter 36, Page 473)<br>• Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 25, Page 432)<br>• Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 36, Page 471)<br>• https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/abo-blood-group-system<br>• https://youtu.be/wfqnNuYIY78 |

## Biochemistry Self-Directed Learning (SDL)

| Topics Of SDL | Learning Objectives | Learning resources |
|---|---|---|
| Structure of hemoglobin and myoglobin | • Describe Structure of hemoglobin<br>• Describe structure of myoglobin.<br>• Discuss Biochemical roles of hemoglobin and myoglobin. | • Lippincott Illustrated reviews of biochemistry 8th edition (Chapter 03, page 25-28)<br>• https://doi.org/10.1016/j.bcmd.2017.10.006<br>• https://www.youtube.com/watch?v=Qv-KExGKAYw<br>• Use digital library<br>• https://chemed.chem.purdue.edu/genchem/topicreview/bp/1biochem/blood3.html |
| Types of Hemoglobin | • Enlist various types of Hemoglobin.<br>• Describe Importance of heme and globin components<br>• Interpret importance of HbA1c in diagnosis of Diabetes | • Lippincott Illustrated reviews of biochemistry 8th edition (Chapter 03, page 33-34)<br>• https://pubmed.ncbi.nlm.nih.gov/34200315/<br>• https://www.youtube.com/@DrAishwaryaKelkar<br>• Use digital library<br>• https://www.ucsfhealth.org/medical-tests/hemoglobin-electrophoresis#:~:text=Many%20different%20types%20of%20hemoglobin,have%20small%20amounts%20of%20HbF |
| Oxygen dissociation curve. | • Discuss Importance of oxygen dissociation curve.<br>• Enlist various factors affecting the curve.<br>• | • Lippincott Illustrated reviews of biochemistry 8th edition (Chapter 03, page 28-32)<br>• https://pubmed.ncbi.nlm.nih.gov/2650756/<br>• https://youtu.be/BYGPkRFvzOc<br>• Use digital library<br>• https://www.osmosis.org/learn/Oxygen-hemoglobin_dissociation_curve |
| Hemoglobinopathies | • Discuss hemoglobinopathies.<br>• Enlist Types of thalassemia.<br>• Discuss Familial counseling.<br>• Elaborate Preventive measures. | • Lippincott Illustrated reviews of biochemistry 8th edition (Chapter 03, page 35-39)<br>• https://pubmed.ncbi.nlm.nih.gov/30193516/<br>• https://youtu.be/34u1sOLrgV0<br>• Use digital library<br>• https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3163784/ |
| Heme synthesis | • Describe enzymatic regulation of heme synthesis | • Lippincott Illustrated reviews of biochemistry 8th edition (Chapter 21, page 277-279) |

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| | | • https://www.sciencedirect.com/science/article/pii/S0891584999002233<br>• Use digital library<br>• https://www.youtube.com/watch?v=f-0n_eOK4JE<br>• https://pubmed.ncbi.nlm.nih.gov/29126700/ |
| Porphyria | • Discuss various types of porphyria | • Lippincott Illustrated reviews of biochemistry 8th edition (Chapter 21, page 279-281)<br>• https://pubmed.ncbi.nlm.nih.gov/20226990/<br>• https://www.mayoclinic.org/diseases-conditions/porphyria/symptoms-causes/syc-20356066#:~:text=Porphyria%20(por%2DFEAR%2De,the%20body's%20organs%20and%20tissues.<br>• https://www.aacc.org/science-and-research/clinical-chemistry-trainee-council/trainee-council-in-english/pearls-of-laboratory-medicine/2012/porphyrias |
| Breakdown of hemoglobin | • Elaborate steps in the breakdown of hemoglobin.<br>• Describe Steps in synthesis of Bilirubin<br>• Recall Normal level of S. Bilirubin. | • Lippincott Illustrated reviews of biochemistry 8th edition (Chapter 21, page 282-283)<br>• https://www.sciencedirect.com/science/article/pii/S0891584999002233<br>• Use digital library<br>• https://www.youtube.com/watch?v=f-0n_eOK4JE<br>• https://pubmed.ncbi.nlm.nih.gov/29126700/ |
| Jaundice | • Define jaundice.<br>• Recall normal level of Bilirubin.<br>• Enlist types of Jaundice.<br>• Describe Biochemical tests to distinguish various types of jaundice.<br>• Describe Physiological Jaundice | • Lippincott Illustrated reviews of biochemistry 8th edition (Chapter 21, page 284-285)<br>• https://pubmed.ncbi.nlm.nih.gov/14765767/<br>• https://www.youtube.com/watch?v=gIACp5js4MU<br>• https://my.clevelandclinic.org/health/diseases/15367-adult-jaundice |

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| Plasma proteins | • Describe plasma proteins.<br>• Discuss Biochemical role of various plasma proteins.<br>• Recall normal levels of plasma proteins<br>• Illustrate Role of A/G ratio. | • Harpers Illustrated biochemistry 30th edition (Chapter 49, page 588-589)<br>• http://ib.bioninja.com.au/options/option-d-human-physiology/d3-functions-of-the-liver/plasma-proteins.html<br>• https://www.nottingham.ac.uk/nmp/sonet/rlos/bioproc/plasma_proteins/page_three.html<br>• https://pubmed.ncbi.nlm.nih.gov/21544836/<br>• Use digital library |
| Acute phase proteins & Albumin | • Describe Role of albumin.<br>• Discuss Role of C- reactive protein. | • Harpers Illustrated biochemistry 30th edition (Chapter 49, page 590-592)<br>• https://www.youtube.com/watch?v=xMSEl1ad0z8<br>• https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3053509/<br>• https://pubmed.ncbi.nlm.nih.gov/9971870/<br>• Use digital library |
| Haptoglobin and transferrin | • Describe Structure of Haptoglobin and transferrin.<br>• Discuss biochemical Role of Haptoglobin and transferrin. | • Harpers Illustrated biochemistry 30th edition (Chapter 49, page 592)<br>• https://pubmed.ncbi.nlm.nih.gov/23016887/<br>• https://www.youtube.com/watch?v=QR_hcSow4OI<br>• https://pubmed.ncbi.nlm.nih.gov/7027909/<br>• Use digital library |
| Ferritin and hemosiderin | • Describe biochemical role of ferritin and hemosiderin.<br>• Describe Hemosiderosis. | • Harpers Illustrated biochemistry 30th edition (Chapter 49, page 592-594)<br>• http://www.vivo.colostate.edu/hbooks/pathphys/topics/ferritin.html<br>• https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4831249/<br>• https://www.forthwithlife.co.uk/blog/whats-the-difference-between-ferritin-and-iron/<br>• Use digital library |

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| Ceruloplasmin. | • Describe biochemical role of ceruloplasmin.<br>• Discuss Wilson's disease. | • Harpers Illustrated biochemistry 30th edition (Chapter 49, page 595-597)<br>• https://pubmed.ncbi.nlm.nih.gov/12055353/<br>• https://www.youtube.com/watch?v=KCh-7Ghj0jY<br>• https://www.mountsinai.org/health-library/tests/ceruloplasmin-blood-test<br>• Use digital library |
| Antiproteases and amyloidosis | • Describe biochemical role of antiproteases and amyloidosis. | • Harpers Illustrated biochemistry 30th edition (Chapter 49, page 597-598)<br>• https://pubmed.ncbi.nlm.nih.gov/31986086/<br>• https://pubmed.ncbi.nlm.nih.gov/1719439/<br>• https://www.youtube.com/watch?v=CQ5q3phGdtQ<br>• Use digital library |
| Immunoglobulins | • Describe Structure of Immunoglobulin.<br>• Discuss biochemical role of various Immunoglobulin.<br>• Elaborate Class switching. | • Harpers Illustrated biochemistry 30th edition (Chapter 49, page 599-603)<br>• https://pubmed.ncbi.nlm.nih.gov/4188929/<br>• https://www.youtube.com/watch?v=29mlSMaD-cY<br>• https://medlineplus.gov/lab-tests/immunoglobulins-blood-test/#:~:text=Immunoglobulins%20are%20also%20called%20antibodies,to%20destroy%20only%20those%20germs.<br>• Use digital library |
| AIDs | • Define AIDs<br>• Describe Immunological defects in AIDs.<br>• Discuss various preventive measures. | • Mushtaq volume II, 7th edition (chapter 11 page – 333-338)<br>• https://pubmed.ncbi.nlm.nih.gov/3277764/<br>• https://www.who.int/news-room/fact-sheets/detail/hiv-aids#:~:text=Acquired%20immunodeficiency%20syndrome%20(AIDS)%20is,tuberculosis%2C%20infections%20and%20some%20cancers.<br>• https://www.cdc.gov/hiv/basics/whatishiv.html<br>• Use digital library |

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|---|---|---|
| Folic acid. | • Recall Sources of folic acid.<br>• Discuss deficiency effects of folic acid<br>• Describe biochemical role of folic acid.<br>• Recall Recommended Dietary allowance. | • Lippincott Illustrated reviews of biochemistry 8th edition (Chapter 28, page 378-379)<br>• https://pubmed.ncbi.nlm.nih.gov/29777755/<br>• https://www.cdc.gov/ncbddd/folicacid/about.html<br>• https://www.cdc.gov/ncbddd/folicacid/about.html#:~:text=When%20the%20baby%20is%20developing,the%20early%20brain%20and%20spine.<br>• Use digital library |
| Vitamin B12 | • Recall Sources of Vitamin B12<br>• Describe biochemical role of vitamin B12<br>• Discuss Deficiency effects of B12 | • Lippincott Illustrated reviews of biochemistry 8th edition (Chapter 28, page 379-381)<br>• https://pubmed.ncbi.nlm.nih.gov/25824066/<br>• https://ods.od.nih.gov/factsheets/VitaminB12-HealthProfessional/<br>• https://www.youtube.com/watch?v=j-2xHmcKkcy<br>• Use digital library |
| Iron | • Recall Sources of iron.<br>• Describe Transport and absorption of iron.<br>• Discuss hyper and hypo functions of iron. | • Lippincott Illustrated reviews of biochemistry 8th edition (Chapter 29, page 403-404)<br>• https://pubmed.ncbi.nlm.nih.gov/34373750/<br>• https://www.youtube.com/watch?v=vSkb0kDacjs<br>• https://ods.od.nih.gov/factsheets/Iron-HealthProfessional/<br>• Use digital library |

## Histology Practicals Skill Laboratory (SKL)

| Topic | At the End of The Session Students Should Be Able To: | Learning Domains | Teaching Strategy | Assessment Tools |
|---|---|---|---|---|
| Lymph node | • Identify lymph node under microscope | P | Skill Lab | OSPE |
| | • Focus the slide | P | | |
| | • Draw the histological structure of lymph node | C2 | | |
| | • Enlist two identification points of lymph node | C1 | | |
| Thymus | • Identify the slide of thymus under light microscope | P | Skill Lab | OSPE |
| | • Focus the slide | P | | |
| | • Draw the histological structure of thymus | C2 | | |
| | • Enlist two identifications points of thymus | C1 | | |
| Spleen | • Identify the slide of spleen under light microscope | P | Skill Lab | OSPE |
| | • Focus the slide | P | | |
| | • Draw histological structure of spleen, | C2 | | |
| | • Enlist two identification points of spleen | C1 | | |
| Tonsils | • Identify the slide of tonsils under light microscope | P | Skill Lab | OSPE |
| | • Focus the slide | P | | |
| | • Draw histological structure of tonsils | C2 | | |
| | • Write two identification points of tonsils | C1 | | |

## Physiology Practicals Skill Laboratory (SKL)

| Topic | Learning Objectives | Learning Domains | Learning Strategy | Assessment Tools |
|---|---|---|---|---|
| Determination of Rh blood group | • Principle<br>• Procedure<br>• Methods<br>• Types of blood groups<br>• Clinical Correlations of blood transfusion | C1/C3<br>A3<br>P3 | Practical/ skill lab | Viva Voce<br>OSPE<br>Video Assisted Assessment |
| Determination of Clotting time (CT) | • Procedure<br>• Clinical importance<br>• Recall Normal values | C1/C3<br>A3<br>P3 | Practical/ skill lab | Viva Voce<br>OSPE<br>Video Assisted Assessment |
| Determination of Bleeding time (BT) | • Procedure<br>• Clinical importance<br>• Recall Normal values | C1/C3<br>A3<br>P3 | Practical/ skill lab | Viva Voce<br>OSPE<br>Video Assisted Assessment |
| Recording of Body Temperature | • Principle<br>• Procedure<br>• Methods<br>• Clinical Correlations | C1/C3<br>A3<br>P3 | Practical/ skill lab | Viva Voce<br>OSPE<br>Video Assisted Assessment |
| Reference: Saqib Practical Copy First Year | | | | |

## Biochemistry Practical Skill Laboratory (SKL)

| Topic | At the End of Practical Students Should Be Able To | Learning Domain | Teaching Strategy | Assessment Tool |
|---|---|---|---|---|
| Draw of Blood Technique | • How to draw blood | P | Skill Lab | OSPE |
| Quantitative Estimation of Serum Total Proteins | • Perform estimation of serum Protein<br>• Describe Principal, method, normal blood level and clinical significance of S. Proteins | P | Skill Lab | OSPE |
| Hemin crystals Technique to draw blood | • Describe Preparation, shape and clinical significance of hemin crystals Illustrate Method and precautions to draw blood. | P | Skill Lab | OSPE |
| Estimation of S. Bilirubin | • Perform estimation of serum bilirubin<br>• Describe Principal, method, normal blood level and clinical significance of S. Bilirubin | P | Skill Lab | OSPE |

## SECTION - III

# Basic and Clinical Sciences (Vertical Integration)

**Content**

- **CBLs**
- **PBls**
- **Vertical Integration LGIS**

# Case Based Learning Objectives (CBL)

| Subjects | Topics | At the end of the session the student should be able to | Learning Domains |
|---|---|---|---|
| Anatomy | • Ankle sprain | Apply basic knowledge of subject to study clinical case. | C3 |
| | • Flat foot | Apply basic knowledge of subject to study clinical case. | C3 |
| Physiology | • Anemia | Apply basic knowledge of subject to study clinical case | C3 |
| Biochemistry | • Thalassemia | Apply basic knowledge of subject to study clinical case. | C3 |
| | • Jaundice | Apply basic knowledge of subject to study clinical case. | C3 |

# Vertical Integration LGIS

## Pathology

| Topic | At the End of Lecture Students Should Be Able To | Learning Domain | Teaching Strategy | Assessment Tool |
|---|---|---|---|---|
| Mediators of Inflammation | • Define inflammation | C1 | LGIS | MCQ |
| | • Classify inflammation | C2 | | |
| | • Classify mediators of inflammation<br>• Cell derived Plasma derived | C2 | | |
| | • Describe general features of mediators of inflammation | C1 | | |

## Medicine

| Topic | At the End of Lecture Students Should Be Able To | Learning Domain | Teaching Strategy | Assessment Tool |
|---|---|---|---|---|
| Jaundice | • Discuss Jaundice. | C2 | LGIS | MCQs |
| | • Discuss various Types and Subtypes of Jaundice. | C2 | | |
| | • Discuss the signs and symptoms of a patient with Jaundice due to various Causes. | C2 | | |
| | • Discuss the workup for diagnosis of different type of Jaundice | C2 | | |
| | • Discuss Treatment of Various Causes of Jaundice. | C2 | | |
| | • Discuss the diagnostic workup and treatment. | C2 | | |
| | • Define Heat Stroke. | C1 | | |
| | • Discuss the clinical Presentation of Heat Stroke. | C2 | | |
| | • Discuss the diagnostic workup and management. | C2 | | |

## Obstetrics & Gynecology

| Topic | At the End of Lecture Students Should Be Able To | Learning Domain | Teaching Strategy | Assessment Tool |
|---|---|---|---|---|
| Rh incompatibility and its significance | • Know the basic pathophysiology of Rh sensitization | C2 | LGIS | MCQs |
| | • Describe the fetal effects of Rh isoimmunization | C2 | | |
| | • Understand signs of fetal anemia | C2 | | |
| | • Describe role of Anti-D antibodies in prevention of Rh isoimmunization | C2 | | |

## List of Blood & Immunity Module Vertical Courses Lectures

## SECTION – IV

# Spiral Courses

### Content

- **Longitudinal Themes**
    - **The Holy Quran Translation**
    - **Family Medicine**
    - **Biomedical Ethics & Professionalism**
    - **Early Clinical Exposure (ECE)**

# Introduction to Spiral Courses

## The Holy Quran Translation

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

## Bioethics

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

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

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

## Professionalism

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

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

## Communication Skills

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

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

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

## Behavioral Sceinces

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

## Family Medicine

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

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

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

## Artificial Intelligence

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

## Integrated Undergraduate Research Curriculum

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

## Entrepreneurship

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

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

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

## Digital Literacy Module

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

## Early Clinical Exposure (ECE)

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

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

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

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

## Family Medicine

| Topic | At the End of Lecture Students Should Be Able To | Learning Domain | Teaching Strategy | Assessment Tool |
|---|---|---|---|---|
| Anemia | • Define Anemia. | C1 | LGIS | MCQs |
| | • Discuss various Types and Subtypes of Anemia. | C2 | | |
| | • Discuss the signs and symptoms of a patient with Anemia. | C2 | | |
| | • Discuss the workup for diagnosis of type of anemia. | C2 | | |
| | • Discuss Treatment of Various types of anemia. | C2 | | |

## Biomedical Ethics

| Topics | At the end of session students should be able to: | Learning Domains | Teaching Strategy | Assessment Tools |
|---|---|---|---|---|
| Laboratory Ethics | At the end of the session students should be able to;<br>• Understand the importance of taking permission before performing procedures (drawing blood, administering injections etc.) during laboratory sessions. A**1**<br>• Show Respects other health professional team members and complete assigned task in professional manner. **A1**<br>• Employ collaborative negotiation to resolve conflict, anger, confusion and misunderstanding. A2 | A1<br>A1<br>A2 | Short video demonstration on violation of Ethical principle of autonomy from suit CBEC Video resources | • Assignment based assessment involving real life case scenarios under aggregate Marks (Internal Assessment)<br>• Assignment to be uploaded on LMS |

## Integrated Undergraduate Research Curriculum (IUGRC)

| Topics | At the end of the session the student should be able to: | Learning Domains | Teaching Strategy | Assessment Tool |
|---|---|---|---|---|
| Practical session 3 | In supervised session, after individual work sharing (PAL) on feedback and work assigned in last session (pr. session 2) on specific areas UEIH-Poster formation, students will be educated more on retrial and review of focused scientific information and extracting the relevant material for Posters: (Los): after this student will be able to<br>• Present the individual work assigned before whole group.<br>• Understand more, the techniques used to access, retrieve and review and source of Scientific literature<br>• Make search string and perform literature search using Boolean operators<br>• Access scientific databases and carry out an effective literature review using a number of sources or databases (PubMed).<br>• Hold discussions<br>• Refine their work towards a UEIH-Poster formation | C3<br>C3 | Activity | MCQs |

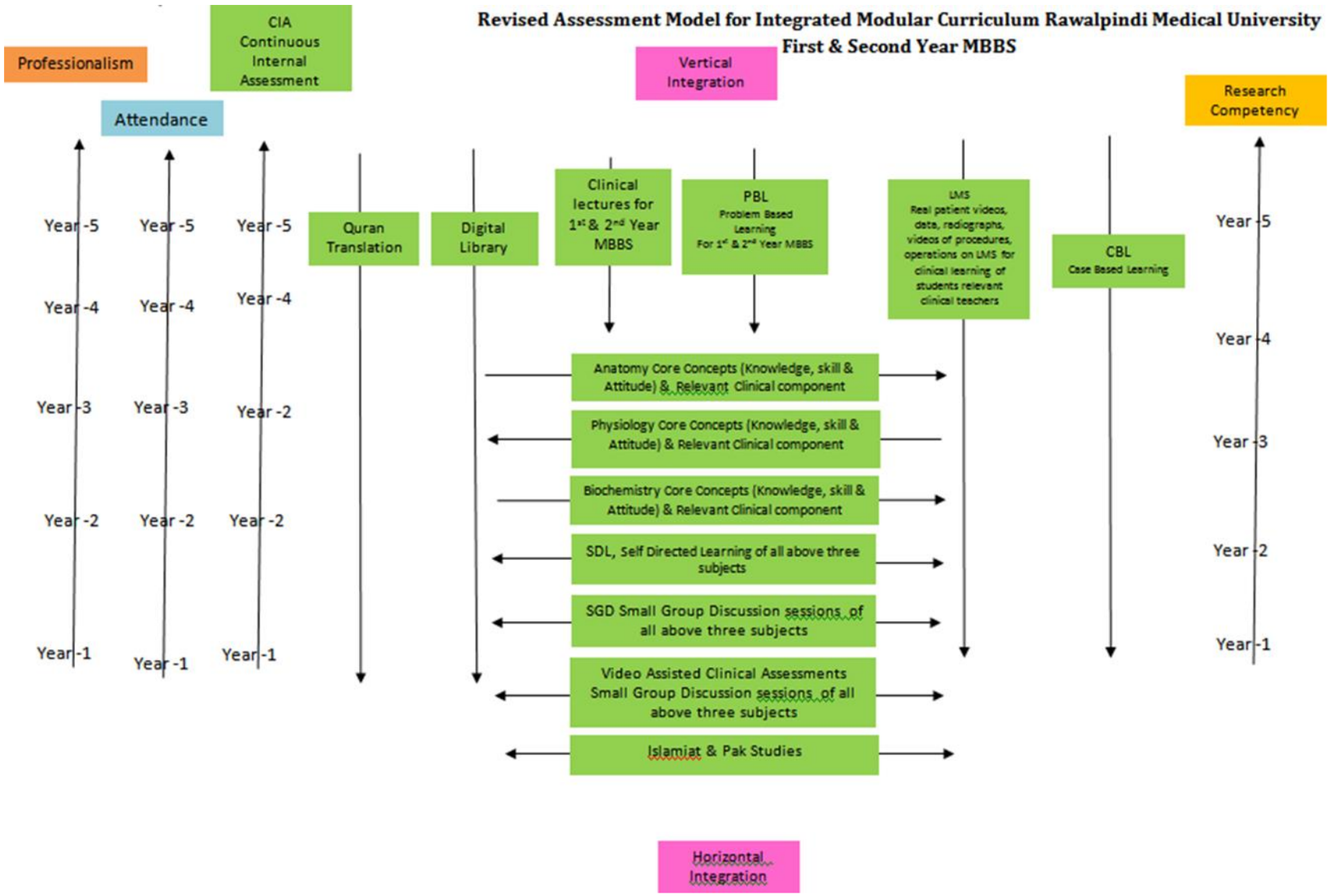
## List of Blood & Immunity Module Module Spiral Courses Lectures

## SECTION - V

# Assessment Policies

### Contents

- **Assessment plan**
- **Types of Assessment:**
- **Modular Examinations**
- **Block Examination**




**Gauge for Continuous Internal Assessment (CIA)**

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

60% and above is passing marks.

**Gauge for attendance percentage**

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

90% is eligibility criteria for appearing professional examination.

## Assessment plan

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

## Types of Assessment:

The assessment is formative and summative.

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

## Modular Assessement

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

## Block Assessement

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

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

## Table 4-Assessment Frequency & Time in Blood and Immunity Module

| Block | Sr # | Module – 1<br>Blood & Immunity Module Components | Type of Assessments | Total Assessments Time | | | No. of Assessments | |
|---|---|---|---|---|---|---|---|---|
| | | | | Assessment Time | Summative Assessment Time | Formative Assessment Time | | |
| Block-II | 1 | Weekly LMS Based Assessments (Anatomy, Physiology & Biochemistry) | Formative | 2 Hours | 3 Hours 45 Minutes | 3 Hours | 2 Formative | 6 Summative |
| | 2 | End Module Examinations (SEQ, SAQ, EMQ & MCQs Based) | Summative | 2 Hours | | | | |
| | 3 | Audio Vissual (AV) OSPE (10 slides)<br>5 minutes per slide | Summative | 50 Minutes | | | | |
| | 4 | Anatomy Structured and Clinically Oriented Viva | Summative | 10 Minutes | | | | |
| | 5 | Physiology Structured & Clinically oriented Viva voce | Summative | 10 Minutes | | | | |
| | 6 | Assessment of Clinical Lectures & Spiral Curriculums | Formative | 60 Minutes | | | | |

## Learning Resources

| Subjects | Resources |
|---|---|
| Anatomy | A. Gross Anatomy<br>1. Gray's Anatomy by Prof. Susan Standring 42th edition, Elsevier.<br>2. Clinical Anatomy for Medical Students by Richard S. Snell 10th edition.<br>3. Clinically Oriented Anatomy by Keith Moore 9th edition.<br>4. Cunningham's Manual of Practical Anatomy by G.J. Romanes, 16th edition, Vol-I, II and III<br>B. Histology<br>1. B. Young J. W. Health Wheather's Functional Histology 6th edition.<br>2. Medical Histology by Prof. Laiq Hussain 7th edition.<br>3. Junqueira's Basic Histology<br>C. Embryology<br>1. Keith L. Moore. The Developing Human 11th edition.<br>2. Langman's Medical Embryology 14th edition.<br>D. Website<br>1. https://my.clevelandclinic.org/health/articles/9117-male-reproductive-system<br>2. https://teachmeanatomy.info/pelvis/female-reproductive-tract/<br>3. https://www.kenhub.com/en/start/pelvis-and-perineum<br>E. YouTube<br>1. https://www.youtube.com/watch?v=G0ZuCilCu3E<br>2. https://www.youtube.com/watch?v=50iuBgTQCrQ<br>F. HEC Digital Library<br>1. https://www.sciencedirect.com/science/article/pii/S0015028220304350<br>2. https://link.springer.com/article/10.1007/s11356-021-16581-9<br>3. https://link.springer.com/chapter/10.1007/978-3-030-30766-0_25<br>https://onlinelibrary.wiley.com/doi/abs/10.1111/and.13712<br>3. https://www.youtube.com/watch?v=50iuBgTQCrQ |

| | |
|---|---|
| Physiology | A. Textbooks:<br>**1.** 1.Textbook of Medical Physiology by Guyton And Hall.14th edition.<br>**2.** 2.Ganong's Review of Medical Physiology.25TH Edition<br><br>B. Reference Books:<br>**3.** Human Physiology by Lauralee Sherwood 10th edition.<br>**4.** Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.<br>**5.** Best & Taylor Physiological Basis of Medical Practice 13th edition.<br><br>6. Berne & Levy Physiology 7th edition.<br>C. Website<br>**1.** https://www.ncbi.nlm.nih.gov/books/NBK531504/<br>**2.** https://en.wikipedia.org/wiki/Inflammation<br>**3.** https://www.verywellhealth.com/signs-of-inflammation-4580526<br>**4.** https://www.hematology.org/education/patients/bleeding-disorders<br><br>D. YouTube<br>**1.** https://youtu.be/cm8IK24RRvA<br>**2.** https://youtu.be/TelOcCkZX7c<br>**3.** https://youtu.be/ZLuACVlG77U<br>**4.** https://youtu.be/WFm9j1rNkQs<br><br>E. HEC Digital Library<br>**1.** https://www.sciencedirect.com/science/article/pii/S0006497121070403<br>**2.** https://www.sciencedirect.com/topics/pharmacology-toxicology-and-pharmaceutical-science/mononuclear-phagocyte-system<br>**3.** https://www.sciencedirect.com/topics/medicine-and-dentistry/hemoglobinopathy<br>**4.** https://www.sciencedirect.com/topics/neuroscience/hemostasis<br>F. Physiology Journals<br>1. https://accessmedicine.mhmedical.com/content.aspx?bookid=1366&sectionid=73247095<br>2. https://www.msdmanuals.com/professional/hematology-and-oncology/anemias-caused-by-hemolysis/overview-of-hemoglobinopathies<br>3. https://derangedphysiology.com/main/cicm-primary-exam/required-reading/haematological-system/Chapter%20012/structure-function-production-and-fate-red-blood-cells<br>4. https://www.healthline.com/health/thermoregulation |

| | |
|---|---|
| Biochemistry | Textbooks<br>1. Harper's Illustrated Biochemistry 30th edition.<br>2. Lippincott biochemistry 8th edition<br>B. Reference Books<br>1.Lehninger Principle of Biochemistry 8th edition.<br>2. Biochemistry by Devlin 7th edition.<br><br>C. Website<br>• https://chemed.chem.purdue.edu/genchem/topicreview/bp/1biochem/blood3.html<br>https://www.ucsfhealth.org/medical-tests/hemoglobin-electrophoresis#:~:text=Many%20different%20types%20of%20hemoglobin,have%20small%20amounts%20of%20HbF<br>• https://my.clevelandclinic.org/health/diseases/15367-adult-jaundice<br>https://pubmed.ncbi.nlm.nih.gov/23016887/<br>http://www.vivo.colostate.edu/hbooks/pathphys/topics/ferritin.html<br>https://www.osmosis.org/learn/Oxygen-hemoglobin_dissociation_curve<br>https://www.sciencedirect.com/science/article/pii/S0891584999002233<br>https://pubmed.ncbi.nlm.nih.gov/9971870/<br><br>D. YouTube<br>https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3163784/<br>https://www.youtube.com/watch?v=f-0n_eOK4JE<br>https://youtu.be/34u1sOLrgVo<br>https://www.aacc.org/science-and-research/clinical-chemistry-trainee-council/trainee-council-in-english/pearls-of-laboratory-medicine/2012/porphyrias<br>https://www.youtube.com/watch?v=gIACp5js4MU<br>https://www.nottingham.ac.uk/nmp/sonet/rlos/bioproc/plasma_proteins/page_three.html<br>https://www.youtube.com/watch?v=xMSEl1ad0z8<br>https://www.youtube.com/watch?v=QR_hcSow4OI<br>https://www.youtube.com/watch?v=KCh-7Ghj0jY<br><br>E. HEC Digital Library<br>• https://doi.org/10.1016/j.bcmd.2017.10.006<br>• https://pubmed.ncbi.nlm.nih.gov/34200315/<br>• https://pubmed.ncbi.nlm.nih.gov/2650756/<br>https://pubmed.ncbi.nlm.nih.gov/30193516/<br>https://pubmed.ncbi.nlm.nih.gov/29126700/ |

| | |
|---|---|
| | https://www.mayoclinic.org/diseases-conditions/porphyria/symptoms-causes/syc-20356066#:~:text=Porphyria%20(por%2DFEAR%2De,the%20body's%20organs%20and%20tissues.<br>https://pubmed.ncbi.nlm.nih.gov/14765767/<br>http://ib.bioninja.com.au/options/option-d-human-physiology/d3-functions-of-the-liver/plasma-proteins.html<br>https://pubmed.ncbi.nlm.nih.gov/21544836/<br>https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3053509/<br>https://pubmed.ncbi.nlm.nih.gov/7027909/<br>https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4831249/<br>https://pubmed.ncbi.nlm.nih.gov/12055353/<br><br>https://pubmed.ncbi.nlm.nih.gov/20226990/<br>F. Biochemistry Journals<br>• https://pubs.acs.org/journal/bichaw<br>• https://academic.oup.com/jb<br>• https://www.hindawi.com/journals/bri/ |

## SECTION - VI

# Time Table

# Integrated Clinically Oriented Modular Curriculum for First Year MBBS

## Blood and Immunity Module Time Table

## First Year MBBS

**Session 2023-2024**

**Batch- 51**

# Blood and Immunity Module Team

| | | |
|---|---|---|
| Module Name | : | Blood and Immunity Module |
| Duration of module | : | 05 Weeks |
| Coordinator | : | Dr. Rahat |
| Co-coordinator | : | Dr. Kamil Tahir |
| Reviewed by | : | Module Committee |

| Module Committee | | |
|---|---|---|
| 1. | Vice Chancellor RMU | Prof. Dr. Muhammad Umar |
| 2. | Chairperson Anatomy & Dean Basic Sciences | Prof. Dr. Ayesha Yousaf |
| 3. | Director DME | Prof. Dr. Ifra Saeed |
| 4. | Chairperson Physiology | Prof. Dr. Samia Sarwar |
| 5. | Chairperson Biochemistry | Dr. Aneela Jamil |
| 6. | Focal Person Anatomy First Year MBBS | Asso. Prof. Dr. Mohtashim Hina |
| 7. | Focal Person Physiology | Dr. Sidra Hamid |
| 8. | Focal Person Biochemistry | Dr. Aneela Jamil |
| 9. | Focal Person Pharmacology | Dr. Zunera Hakim |
| 10. | Focal Person Pathology | Dr. Asiya Niazi |
| 11. | Focal Person Behavioral Sciences | Dr. Saadia Yasir |
| 12. | Focal Person Community Medicine | Dr. Afifa Kulsoom |
| 13. | Focal Person Quran Translation Lectures | Dr. Fahad Anwar |
| 14. | Focal Person Family Medicine | Dr. Sadia Khan |

| Module Task Force Team | | |
|---|---|---|
| 1. | Coordinator | Dr. Rahat (APWMO of Biochemistry) |
| 2. | DME Focal Person | Dr. Farzana Fatima |
| 3. | Co-coordinator | Dr. Ali Raza (Senior Demonstrator of Anatomy) |
| 4. | Co-Coordinator | Dr. Uzma Zafar (APWMO of Biochemistry) |
| 5. | Co-coordinator | Dr. Kamil Tahir (Senior Demonstrator Physiology) |

| DME Implementation Team | | |
|---|---|---|
| 1. | Director DME | Prof. Dr. Ifra Saeed |
| 2. | Assistant Director DME | Dr. Farzana Fatima |
| 3. | Implementation Incharge 1st & 2nd Year MBBS | Prof. Dr. Ifra Saeed<br>Dr. Farzana Fatima<br>Dr. Saira Aijaz |
| 4. | Editor | Muhammad Arslan Aslam |

# Discipline Wise Details of Modular Contents

| Block | Subjects | Embryology | Histology | Gross Anatomy | CBL | SDL |
|---|---|---|---|---|---|---|
| II | • Anatomy | • Development of pharyngeal arches<br>• Development of spleen<br>• Development of thymus | • Spleen<br>• Thymus<br>• Lymph nodes<br>• Tonsils | Lower Limb<br>• Posterior compartment of leg to foot | • Ankle sprain<br>• Flat foot | • Posterior compartment of leg and flexor retinaculum<br>• Neurovascular organization of posterior compartment of leg<br>• Foot joints<br>• Ankle joints<br>• Sole of foot<br>• Spleen<br>• Gait cycle |
| | • Physiology | • Plasma Proteins<br>• Stages of erythropoiesis & factors affecting erythropoiesis<br>• Hemoglobin & Hemoglobinopathies, Iron Metabolism<br>• Red cell fragility, ESR & Red cell indices, Anemia & polycythemia<br>• Fate of RBCs & Jaundice<br>• Types of immunity, Physiology of innate immunity tolerance & auto immunity<br>• Physiology of acquired immunity B-Cells<br>• Physiology of acquired immunity T-Cells. Allergy and Hypersensitivity reactions, Auto-immune diseases and AIDS<br>• Composition of blood & Hemopoiesis<br>• WBCs classification & formation. Neutrophils, Eosinophils & Basophils and their properties<br>• Platelet formation & function. hemostasis, blood coagulation tests (BT, CT, PT, APTT and INR<br>• Blood coagulation<br>• Concept of intravascular anticoagulants and bleeding disorders (Vit K deficiency, hemophilia and thrombocytopenia)<br>• Thromboembolic condition (DVT, Pulmonary Embolism, DIC) Anticoagulant therapy (Heparin, warfarin, Prevention of blood clotting outside the body)<br>• Physiological mechanism of temperature regulation<br>• Role of Hypothalamus in temperature regulation<br>• Disorders of temperature regulation (Fever, Heat stroke, Exposure of body to extreme cold)<br>• ABO & Rh Blood grouping system<br>• Rh Blood grouping system and Erythroblastosis fetalis<br>• Blood transfusion hazards<br>• Tissue and organ transplantations | | | | |
| | • Biochemistry | • Heme synthesis | | | | |

| | | |
|---|---|---|
| | | • Porphyria<br>• Breakdown of hemoglobin<br>• Jaundice<br>• Blood<br>• Structure of hemoglobin and myoglobin<br>• Types of Hemoglobin<br>• Oxygen dissociation curve.<br>• Abnormalities in Hemoglobin.<br>• Hemoglobinopathies<br>• Plasma proteins<br>• Acute phase proteins & Albumin<br>• Haptoglobin and transferring.<br>• Ferritin and hemosiderin<br>• Ceruloplasmin.<br>• Antiproteases and amyloidosis<br>• Immunoglobulins<br>• AIDs<br>• Folic acid.<br>• Vitamin B12<br>• Iron |
| | Spiral Courses | |
| | • Bioethics & Professionalism | • Activity I<br>• Activity II<br>• Activity III |
| | • Research Club Activity (IUGRC) | • Student practical session no 3 |
| | • Family Medicine | • Aproach to a Patient Aneamia |
| | • The Holy Quran Translation | • |
| | Vertical components | |
| | • Pathology | • Mediators of Inflammation<br>• (Medicine) |
| | • Medicine | • Anemia<br>• Jaundice |
| | • Gynae & Obs | • Rh Incompatibility And Its Significance -Immune |
| | Early Clinical Exposure (ECE) | |
| | | |

# Categorization of Modular Contents

## Anatomy

| Category A* | Category B** | Category C*** | | | |
|---|---|---|---|---|---|
| | | **Demonstrations / SGD** | **CBL** | **SKL/Practical's** | **Self-Directed Learning (SDL)** |
| • General Embryology | • General Histology | • Posterior compartment of leg and flexor retinaculum<br>• Posterior compartment of leg (Neurovascular organization)<br>• Bones of the foot<br>• Dorsum of foot (Muscles and Neurovascular organization)<br>• Ankle joint (ankle sprain)<br>• Joints of foot<br>• Sole of foot (Muscles)<br>• Sole of foot (Neurovascular organization)<br>• Arches of foot<br>• Spleen<br>• Thymus and tonsils<br>• Radiology and surface marking | • Ankle sprain<br>• Flat foot | • Lymph node<br>• Spleen<br>• Thymus<br>• Tonsil | • Posterior compartment of leg and flexor retinaculum<br>• Neurovascular organization of posterior compartment of leg<br>• Foot joints<br>• Ankle joints<br>• Sole of foot<br>• Spleen<br>• Gait cycle |

**Category A*:** By Professor

**Category B**:** By Associate & Assistant Professors

**Category C***:** By Senior Demonstrators & Demonstrators

# Teaching Staff / Human Resources of Department of Anatomy

| Sr. # | Designation of Teaching Staff / Human Resource | Total number of teaching staff |
|---|---|---|
| 1. | Professor of Anatomy Department | 01 |
| 2. | Associate Professor | 01 |
| **3.** | Assistant Professor of Anatomy Department (AP) | 01 |
| 4. | Demonstrators of Anatomy Department | 04 |

## Contact Hours (Faculty)

| Sr. # | Hours Calculation for Various Type of Teaching Strategies | Total Hours |
|---|---|---|
| 1. | Large Group Interactive Session (LGIS) | 2 * 04 = 08 hours |
| 2. | Small Group Discussions (SGD) | 2*16 =32 hours |
| 3. | Practical / Skill Lab | 1.5 * 20 = 30 hours |

## Contact Hours (Students)

| Sr. # | Hours Calculation for Various Type of Teaching Strategies | Total Hours |
|---|---|---|
| 1. | Large Group Interactive Session (LGIS) | 1 * 4 = 04 hours |
| 2. | Small Group Discussions (SGD) | 2*16=32 hours |
| 3. | Practical / Skill Lab | 1.5 * 4 = 6 hours |
| 4. | Self-Directed Learning (SDL) | 2* 4 = 8 hours |

# Physiology

| Category A* | Category B** | Category C*** | | | | |
|---|---|---|---|---|---|---|
| **LGIS** | **LGIS** | **PBL** | **CBL** | **Practical's** | **SGD** | **SDL** |
| • Monocytes - macrophage system & lymphocytes<br>• Process of inflammation and Lines of defense during inflammation | • Plasma Proteins<br>• Stages of erythropoiesis & factors affecting erythropoiesis<br>• Hemoglobin & Hemoglobinopathies, Iron Metabolism<br>• Red cell fragility, ESR & Red cell indices, Anemia & polycythemia<br>• Fate of RBCs & Jaundice<br>• Types of immunity, Physiology of innate immunity tolerance & auto immunity<br>• Physiology of acquired immunity B-Cells<br>• Physiology of acquired immunity T-Cells. Allergy and Hypersensitivity reactions, Auto-immune diseases and AIDS<br>• Composition of blood & Hemopoiesis<br>• WBCs classification & formation. Neutrophils, Eosinophils & Basophils and their properties<br>• Platelet formation & function. hemostasis, blood coagulation tests (BT, CT, PT, APTT and INR<br>• Blood coagulation<br>• Concept of intravascular anticoagulants and bleeding disorders (Vit K deficiency, hemophilia and thrombocytopenia)<br>• Thromboembolic condition (DVT, Pulmonary Embolism, DIC) Anticoagulant therapy (Heparin, warfarin, Prevention of | | | 1. Determination of Rh blood group<br>2. Determination of Clotting time (CT)<br>3. Determination of Bleeding time (BT)<br>4. Recording of Body Temperature | 1. Functions & composition of blood, Hemopoiesis and Bone marrow<br>2. Hemoglobin & Hemoglobinopathies, Iron Metabolism<br>3. Platelet formation & function. hemostasis, blood coagulation tests (BT, CT, PT, APTT and INR)<br>4. Physiological mechanism of temperature regulation<br>5. Stages Of Erythropoiesis Factors Affecting Erythropoiesis (First week)<br>6. Physiology of WBC (third week)<br>7. Physiology of platelets (Fourth week)<br>8. Blood transfusion hazards. Tissue and organ transplantations (Fifth week)<br>9. Disorders of temperature regulation (Fever, Heat stroke, Exposure of body to extreme cold) (Fifth | 1. SDL On Campus Platelet formation & function. hemostasis, blood coagulation tests (BT, CT, PT, APTT and INR)<br>2. Concept of intravascular anticoagulants and bleeding disorders (Vit K deficiency, hemophilia and thrombocytopenia)<br>3. SDL Off Campus Composition of blood<br>4. Functions of Plasma Proteins<br>5. WBCs classification & formation. Neutrophils, Eosinophils & Basophils and their properties<br>6. Monocytes - macrophage system & lymphocytes<br>7. Process of inflammation and Lines of defense during inflammation<br>8. Red cell fragility, |

| | | | | | | |
|---|---|---|---|---|---|---|
| | blood clotting outside the body)<br>• Physiological mechanism of temperature regulation<br>• Role of Hypothalamus in temperature regulation<br>• Disorders of temperature regulation (Fever, Heat stroke, Exposure of body to extreme cold)<br>• ABO & Rh Blood grouping system<br>• Rh Blood grouping system and Erythroblastosis fetalis<br>• Blood transfusion hazards. Tissue and organ transplantations | | | | week) | ESR & Red cell indices, Anemia & polycythemia<br>9. Blood coagulation<br>10. ABO & Rh Blood grouping system |

**Category A*:** By HOD and Associate Professor

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

**Category C***:** By Demonstrators and Residents

## Teaching Staff / Human Resource of Department of Physiology

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

## Contact Hours (Faculty) & Contact Hours (Students)

| Sr. # | Hours Calculation for Various Type of TeachingStrategies | Total Hours |
|---|---|---|
| 1. | Large Group Interactive Session (LECTURES) | 11 x 2 = 22 hours |
| 2. | Small Group Discussions (SGD)/CBL | 20 x 1.5 hour = 30 hours + 6 hours= 36 hours |
| 3. | Problem Based Learning (PBL) | --- |
| 4. | Practical / Skill Lab | 20 x 1.5 hour = 30 hours |
| 5. | Self-Directed Learning (SDL) | 2x1 = 2hours (on campus)<br>8x1 = 8 hours (off campus) |

## Biochemistry

| Category A* | Category B** | Category C*** | | | |
|---|---|---|---|---|---|
| **LGIS** | **LGIS** | **PBL** | **CBL** | **Practical's** | **SGD** |
| • Heme synthesis<br>• Porphyria<br>• Breakdown of hemoglobin<br>• Jaundice | • Blood<br>• Structure of hemoglobin and myoglobin<br>• Types of Hemoglobin<br>• Oxygen dissociation curve.<br>• Abnormalities in Hemoglobin.<br>• Hemoglobinopathies<br>• Plasma proteins<br>• Acute phase proteins & Albumin<br>• Haptoglobin and transferring<br>• Ferritin and hemosiderin<br>• Ceruloplasmin.<br>• Antiproteases and amyloidosis<br>• Immunoglobulins<br>• AIDs<br>• Folic acid.<br>• Vitamin B12<br>• Iron | | • Thalassemia<br>• Jaundice | • Estimation of Bilirubin by spectrophometer<br>• Estimation of total protein by spectrophometer<br>• How to draw blood technique<br>• Haemin crystals | • Types of Hb and oxygen dissociation curve<br>• Iron |

**Category A*:** By HOD and APWMO with Postgraduate Qualification

**Category B**:** By All Senior Demonstrators

**Category C***:** By All Demonstrators

# Teaching Staff / Human Resource of Department of Biochemistry

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

**Contact Hours (Faculty) & Contact Hours (Students)**

| Sr. # | Hours Calculation for Various Type of Teaching Strategies | Total Hours (Faculty) | Total Hours (student) |
|---|---|---|---|
| 1. | Large Group Interactive Session (LECTURES) | 2 * 12 = 24 hours | 12 |
| 2. | Small Group Discussions (SGD) | 1.5 * 5*4 = 30 hours | 06 |
| 3. | Problem Based Learning (PBL) | Zero | zero |
| 4. | Practical / Skill Lab | 1.5 * 5*4 = 30 hours | 6 |
| 5. | Self-Directed Learning (SDL) | ---------- | 06 |

# Blood and Immunity Module (First Week)
# (29-07-2024 To 03-08-2024)

| Date/Day | 8:00am-9:20am | 9:20am – 10:10am | 10:10am – 10:30am | 10:30am-11:20am | 11:20am-12:10pm | 12:10pm-12:30pm | 12:30pm – 2:00pm | Home Assignments(2HRS) |
|---|---|---|---|---|---|---|---|---|
| 29-07-2024 MONDAY | **SGD/DISSECTION**<br>Posterior Compartment of Leg & Flexor Retinaculum | | Break | **PBL 1 (SESSION – I)**<br>PBL Team | **PHYSIOLOGY (LGIS)**<br>Composition of blood & Hemopoiesis – Dr Sheena (Even)<br>Plasma Proteins – Dr. Sidra (Odd) | Break | Practical & SGD/CBL Topics & venue mentioned at the end | SDL Physiology Composition of blood |
| 30-07-2024 TUESDAY | **SGD/DISSECTION**<br>Posterior Compartment of Leg (Neurovascular Organization) | | Break | **BIOCHEMISTRY (LGIS)**<br>Types of Hb & O2 Dissociation Curve – Dr. Kashif (Even)<br>Heme Synthesis & Porphyria – Dr. Romessa (Odd) | **PHYSIOLOGY (LGIS)**<br>Plasma Proteins – Dr. Sidra (Even)<br>Composition of blood & Hemopoiesis – Dr Sheena (Odd) | Break | Practical & SGD/CBL Topics & venue mentioned at the end | SDL Physiology Functions of plasma protein |
| 31-07-2024 WEDNESDAY | **SGD/DISSECTION**<br>Bones of the foot | | Break | **PHYSIOLOGY (LGIS)**<br>Stages of erythropoiesis & factors affecting erythropoiesis – Dr. Sidra (Even)<br>WBCs classification & formation. Neutrophils, Eosinophils & Basophils and their properties – Dr Sheena (Odd) | **PHYSIOLOGY (LGIS)**<br>WBCs classification & formation. Neutrophils, Eosinophils & Basophils and their properties – Dr Sheena (Even)<br>Stages of erythropoiesis & factors affecting erythropoiesis – Dr. Sidra (Odd) | Break | Practical & SGD/CBL Topics & venue mentioned at the end | SDL Biochemistry Structure of hemoglobin, Types of Hb & O2 Dissociation Curve |
| 01-08-2024 THURSDAY | **PATHOLOGY (LGIS)**<br>Mediators of inflammation – Dr. Saeed (Even), Dr. Iqbal (Odd) | **PBL 1 (SESSION – II)**<br>PBL Team | Break | **BIOCHEMISTRY (LGIS)**<br>Heme Synthesis & Porphyria – Dr. Romessa (Even)<br>Types of Hb and structure of Hb and myoglobin – Dr. Kashif (Odd) | **PHYSIOLOGY (LGIS)**<br>Monocytes - macrophage system & lymphocytes – Prof. Dr. Samia Sarwar / Dr. Sheena (Even)<br>Hemoglobin & Hemoglobinopathies, IronMetabolism – Dr. Sidra (Odd) | Break | Practical & SGD/CBL Topics & venue mentioned at the end | SDL Anatomy Bones of Foot |
| 02-08-2024 FRIDAY | **8:00 AM – 9:00 AM**<br>**FAMILY MEDICINE**<br>Anemia – Dr. Umer Daraz (Even), Dr. Iqra (Odd) | **9:00 AM – 10:00AM**<br>**QURAN TRANSLATION**<br>Muaamlaat-3 – Mufti Naeem (Even)<br>Muaasharat-1 – Abdul Wahid (Odd) | **10:00AM– 11:00AM**<br>**BIOCHEMISTRY (LGIS)**<br>Hemoglobinopathies – Dr Uzma Zafar (Even)<br>Degradation & Jaundice – Dr. Aneela (Odd) | | **11:00AM—12:00PM**<br>**PHYSIOLOGY (LGIS)**<br>Hemoglobin & Hemoglobinopathies, Iron Metabolism – Dr. Sidra (Even)<br>Monocytes - macrophage system & lymphocytes – Prof. Dr. Samia Sarwar / Dr. Sheena(Odd) | Biochemistry SDL<br>Heme Synthesis & Porphyria | | |
| 03-08-2024 SATURDAY | **SGD/DISSECTION**<br>Dorsum of Foot (Muscles and Neurovascular Organization) | | Break | **ANATOMY (LGIS)**<br>Development of pharyngeal arches – Prof. Dr. Ayesha Yousaf (even)<br>Development and histology of Lymph node – Dr. Mohtasham Hina (Associate prof.) (odd) | **SDL** | Break | **Practical & SGD/CBL** Topics & venue mentioned at the end | SDL Anatomy Posterior Compartment of Leg |

## Table No. 1 (Time: 12:20pm – 02:00pm)

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

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

Topics for Skill Lab with Venue

- Lymph node (Anatomy Histology Practical) Venue-Histology laboratory (Dr. Kashif)
- Draw of blood technique (Biochemistry Practical) Venue-Biochemistry laboratory
- Determination of Rh blood group (Physiology –practical) Venue – Physiology Lecture Hall No 5

Schedule for Practical / Small Group Discussion

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

Topics for SGDs / CBL with Venue

- Physiology SGD - Functions & composition of blood, Hemopoiesis and Bone marrow (Basement))
- Biochemistry SGD: Types of Hb and oxygen dissociation curve (Venue: Lecture Hall No 2)

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

| **Batches** | **Roll No** | **Anatomy Teacher** | **Venue** |
|---|---|---|---|
| A | 01-90 | Dr Zeneara Saqib | New Lecture Hall Complex No. 02 |
| B | 91-180 | Dr. Sajjad Hussain | Anatomy Lecture Hall No.3 |
| C | 181-270 | Dr. Ali Raza | Anatomy Lecture Hall No.4 |
| D | 271- onwards | Dr. Qurat ul Ain | New Lecture Hall Complex No. 03 |
| Supervised by Prof. Dr. Ayesha Yousaf | | | |

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

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

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

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

# Blood and Immunity Module (Second Week)
# (12-08-2024 To 17-08-2024)

| Date/Day | 8:00am-9:20am | 9:20am – 10:10am | 10:10am – 10:30am | 10:30am-11:20am | | 11:20am-12:10pm | | 12:10pm-12:30pm | 12:30pm – 2:00pm | Home Assignments(2HRS) |
|---|---|---|---|---|---|---|---|---|---|---|
| 12-08-2024 MONDAY | **SGD/DISSECTION** | | Break | **ANATOMY (LGIS)** | | **PHYSIOLOGY (LGIS)** | | Break | Practical & SGD/CBL Topics & venue mentioned at the end | SDL Physiology WBCs classification & formation. Neutrophils, Eosinophils & Basophils and their properties |
| | Ankle Joint (Ankle Sprain) | | | Development of pharyngeal arches | Development and histology of Lymph Node | Process of inflammation and Lines of defense during inflammation | Red cell fragility, ESR & Red cell indices, Anemia & polycythemia | | | |
| | | | | Prof. Dr. Ayesha Yousaf (Odd) | Dr. Mohtasham Hina (Associate prof.) (Even) | Prof. Dr. Samia Sarwar / Dr. Sheena (Even) | Dr. Sidra (Odd) | | | |
| 13-08-2024 TUESDAY | **DISSECTION/CBL** | | | **BIOCHEMISTRY (LGIS)** | | **PHYSIOLOGY (LGIS)** | | | Practical & SGD/CBL Topics & venue mentioned at the end | SDL Physiology Monocytes -macrophage system & lymphocytes |
| | Joints of Foot | | | Hemoglobinopathies | Heme degradation & Jaundice | Red cell fragility, ESR & Red cell indices, Anemia & polycythemia | Process of inflammation and Lines of defense during inflammation | | | |
| | | | | Dr. Uzma (Odd) | Dr. Aneela (Even) | Dr. Sidra (Even) | Prof. Dr. Samia Sarwar / Dr. Sheena (Odd) | | | |
| 14-08-2024 WEDNESDAY | **Independence Day** | | | | | | | | | |
| 15-08-2024 THURSDAY | **SDL** | **PBL 2 (SESSION – I)** | | **BIOCHEMISTRY (LGIS)** | | **PHYSIOLOGY (LGIS)** | | Break | Practical & SGD/CBL Topics & venue mentioned at the end | SDL Anatomy Neurovascular organization of posterior compartment of leg |
| | | PBL Team | | Aids | Plasma proteins functions, Albumin | Fate of RBCs & Jaundice | Platelet formation & function. hemostasis, blood coagulation tests (BT, CT, PT, APTT and INR) | | | |
| | | | | Dr. Aneel / Dr. Almas (Even) | Dr. Kashif (Odd) | Dr. Sidra (Odd) | Dr. Fareed (Even) | | | |
| 16-08-2024 FRIDAY | Early Clinical Exposure (ECE) | | | | | | | | | |
| 17-08-2024 SATURDAY | **SGD/DISSECTION** | | Break | **BIOCHEMISTRY (LGIS)** | | **PBL 2 (SESSION – II)** | | Break | Practical & SGD/CBL Topics & venue mentioned at the end | Biochemistry SDL Plasma proteins functions, Albumin, AIDs |
| | Dissection | | | Aids | Plasma proteins functions, Albumin | PBL Team | | | | |
| | | | | Dr. Aneel / Dr. Almas (Odd) | Dr. Kashif (Even) | | | | | |

## Table No. 1 (Time: 12:20pm – 02:00pm)

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

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

Topics for Skill Lab with Venue

- Spleen (Anatomy Histology Practical) Venue-Histology Laboratory (Dr. Kashif)
- Estimation of bilirubin by Spectrophotometer (Biochemistry Practical) Venue- Biochemistry Laboratory
- Determination of Clotting time (CT) (Physiology Practical) Venue – Physiology Lab

Schedule for Practical / Small Group Discussion

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

Topics for SGDs / CBL with Venue

- Physiology SGD- Hemoglobin & Hemoglobinopathies, Iron Metabolism (Venue: Lecture Hall No 5)
- Biochemistry CBL – Thalassemia (Lecture Hall No 2)
- Anatomy CBL: Ankle Sprain

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

| Batches | Roll No | Anatomy Teacher | Venue |
|---|---|---|---|
| A | 01-90 | Dr Zeneara Saqib | New Lecture Hall Complex No. 02 |
| B | 91-180 | Dr. Sajjad Hussain | Anatomy Lecture Hall No.3 |
| C | 181-270 | Dr. Ali Raza | Anatomy Lecture Hall No.4 |
| D | 271- onwards | Dr. Qurat ul Ain | New Lecture Hall Complex No. 03 |
| Supervised by Prof. Dr. Ayesha Yousaf | | | |

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

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

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

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

# Blood and Immunity Module (Third Week)
# (19-08-2024 To 24-08-2024)

| Date/Day | 8:00am-9:20am | 9:20am – 10:10am | 10:10am – 10:30am | 10:30am-11:20am | | 11:20am-12:10pm | | 12:10pm-12:30pm | 12:30pm – 2:00pm | Home Assignments(2HRS) |
|---|---|---|---|---|---|---|---|---|---|---|
| 19-08-2024 MONDAY | **SGD/DISSECTION** | | **B r e a k** | **BIOCHEMISTRY (LGIS)** | | **PHYSIOLOGY (LGIS)** | | **B r e a k** | **Practical & SGD/CBL** Topics & venue mentioned at the end | SDL Anatomy joints of Foot |
| | Sole of Foot (Muscles) | | | Vit K | Haptoglobin, ceruloplasmin | Blood coagulation | Types of immunity, Physiology of innate immunity tolerance & auto immunity | | | |
| | | | | Dr. Aneel / Dr. Almas (Even) | Dr. Kashif (Odd) | Dr. Fareed (Even) | Dr. Sidra (Odd) | | | |
| 20-08-2024 TUESDAY | **SGD/DISSECTION** | | | **BIOCHEMISTRY (LGIS)** | | **PHYSIOLOGY (LGIS)** | | | Practical & SGD/CBL Topics & venue mentioned at the end | SDL Physiology Process of inflammation and Lines of defense during inflammation |
| | Sole of Foot (Neurovascular Organization) | | | Vitamin k | Haptoglobin, ceruloplasmin | Types of immunity, Physiology of innate immunity tolerance & auto immunity | Blood coagulation | | | |
| | | | | Dr. Aneel / Dr. Almas (Even) | Dr. Kashif (Odd) | Dr. Sidra (Even) | Dr. Fareed (Odd) | | | |
| 21-08-2024 WEDNESDAY | **SGD/DISSECTION** | | | **BIOMEDICAL ETHICS** | | **PHYSIOLOGY (LGIS)** | | | Practical & SGD/CBL Topics & venue mentioned at the end | SDL Physiology Red cell fragility, ESR & Red cell indices, Anemia & polycythemia |
| | Dissection | | | Activity 1 | | Concept of intravascular anticoagulants and bleeding disorders (Vit K deficiency, hemophilia and thrombocytopenia) | Physiology of acquired immunity B-Cells | | | |
| | | | | | | Dr. Fareed (Even) | Dr. Sidra (Odd) | | | |
| 22-08-2024 THURSDAY | **DISSECTION / CBL** | | | **ANATOMY (LGIS)** | | **PHYSIOLOGY (LGIS)** | | | Practical & SGD/CBL Topics & venue mentioned at the end | SDL Biochemistry Structure of hemoglobin Folic acid & Vitamin B-12 |
| | Arches of Foot | | | Histology & Development of Thymus and Tonsils | Histology and Development of Spleen | Physiology of acquired immunity B-Cells | Concept of intravascular anticoagulants and bleeding disorders (Vit K deficiency, hemophilia and thrombocytopenia) | | | |
| | | | | Dr. Mohtasham Hina (Associate prof.) (Even) | Prof. Dr. Ayesha Yousaf (Odd) | Dr. Sidra (Even) | Dr. Fareed (Odd) | | | |

| Date/Day | 08:00am– 10:00am | | | | 10:00am – 11:00am | | 11:00am – 12:00pm | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 23-08-2024 FRIDAY | **BIOCHEMISTRY (LGIS)** | | **QURAN TRANSLATION** | | **PHYSIOLOGY (LGIS)** | | **PHYSIOLOGY (LGIS)** | | SDL Biochemistry Heme synthesis Vitamin K | |
| | Vitamin 9 and vitamin B12 | Transferrin, ferritin | Muaamlaat-3 | Muaasharat-1 | Thromboembolic condition (DVT, Pulmonary Embolism, DIC) Anticoagulant therapy (Heparin, warfarin, Prevention of blood clotting outside the body) | Physiology of acquired immunity T-Cells. Allergy and Hypersensitivity reactions, Auto-immune diseases and AIDS ls. Ac | Physiology of acquired immunity T-Cells. Allergy and Hypersensitivity reactions, Auto-immune diseases and AIDS | Thromboembolic condition (DVT, Pulmonary Embolism, DIC) Anticoagulant therapy (Heparin, warfarin, Prevention of blood clotting outside the body) | | |
| | Dr. Almas (Even) | Dr.Kashif (Odd) | Mufti Naeem (Odd) | Abdul Wahid (Even) | | | | | | |
| | | | | | Dr. Fareed (Even) | Dr. Sidra (Odd) | Dr. Sidra (Even) | Dr. Fareed (Odd) | | |
| 24-08-2024 SATURDAY | **SGD/DISSECTION** | | | | **ANATOMY(LGIS)** | | **PHYSIOLOGY (LGIS)** | | **B r e a k** | Practical & SGD/CBL Topics & venue mentioned at the end | SDL Anatomy Sole of Foot Online Clinical Evaluation |
| | Gait cycle. | | | | Histology & Development of Thymus and Tonsils | Histology and Development of Spleen of acquired reactions, Auto | Thromboembolic condition (DVT, Pulmonary Embolism, DIC) Anticoagulant therapy (Heparin, warfarin, Prevention of blood clotting outside the body) | Physiology of acquired immunity T-Cells. Allergy and Hypersensitivity reactions, Auto-immune diseases and AIDS | | |
| | | | | | Dr. Mohtasham Hina (Associate prof.) (Odd) | Prof. Dr. Ayesha Yousaf (Even) | Dr. Fareed (Even) | Dr. Sidra (Odd) | | |

## Table No. 1 (Time: 12:20pm – 02:00pm)

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

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

**Topics for Skill Lab with Venue**

- Thymus (Anatomy Histology Practical) Venue-Histology Laboratory (Dr. Kashif)
- Quantitative estimation of serum total proteins (Biochemistry Practical) Venue- Biochemistry Laboratory
- Determination of Bleeding time (BT) (Physiology Practical) Venue – Physiology Lab

**Schedule for Practical / Small Group Discussion**

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

**Topics for SGDs / CBL with Venue**

- Physiology SGD- Platelet formation & function. hemostasis, blood coagulation tests (BT, CT, PT, APTT and INR (Venue: Lecture Hall No 5)
- Biochemistry CBL – Jaundice (Lecture Hall No 2)
- Anatomy CBL: Flate Foot

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

| Batches | Roll No | Anatomy Teacher | Venue |
|---|---|---|---|
| A | 01-90 | Dr Zeneara Saqib | New Lecture Hall Complex No. 02 |
| B | 91-180 | Dr. Sajjad Hussain | Anatomy Lecture Hall No.3 |
| C | 181-270 | Dr. Ali Raza | Anatomy Lecture Hall No.4 |
| D | 271- onwards | Dr. Qurat ul Ain | New Lecture Hall Complex No. 03 |
| Supervised by Prof. Dr. Ayesha Yousaf | | | |

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

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

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

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

# Blood and Immunity Module (Fourth Week)
# (26-08-2024 To 31-08-2024)

| Date/Day | 8:00am-9:20am | 9:20am – 10:10am | 10:10am – 10:30am | 10:30am-11:20am | | 11:20am-12:10pm | | 12:10pm-12:30pm | 12:30pm – 2:00pm | Home Assignments(2HRS) |
|---|---|---|---|---|---|---|---|---|---|---|
| 26-08-2024 MONDAY | **SGD/DISSECTION** | | **Break** | **BIOCHEMISTRY (LGIS)** | | **PHYSIOLOGY (LGIS)** | | **Break** | **Practical & SGD/CBL** Topics & venue mentioned at the end | SDL Anatomy Spleen |
| | Thymus, Tonsils and Spleen | | | Vitamin 9 and vitamin B12 | Transferrin, ferritin | Physiological mechanism of temperature regulation | ABO & Rh Blood grouping system | | | |
| | | | | Dr. Aneela /Dr. Almas Odd) | Dr Kashif (Even) | Dr. Shazia (Even) | Dr. Fahad (Odd) | | | |
| 27-08-2024 TUESDAY | **MEDICINE (LGIS)** | **BIO MEDICAL ETHICS** | | **PHYSIOLOGY (LGIS)** | | **PHYSIOLOGY (LGIS)** | | | Practical & SGD/CBL Topics & venue mentioned at the end | SDL Physiology Red cell fragility, ESR & Red cell indices, Anemia & polycythemia |
| | Jaundice | **(CLUB ACTIVITY 2)** | | Rh Blood grouping system and Erythroblastosis fetalis | Role of Hypothalamus in temperature regulation | Role of Hypothalamus in temperature regulation | Rh Blood grouping system and Erythroblastosis fetalis | | | |
| | Dr. Umer Daraz (Even) / Dr. Iqra (Odd) | | | Dr. Fahad (Even) | Dr. Shazia (Odd) | Dr. Shazia (Even) | Dr. Fahad (Odd) | | | |
| 28-08-2024 WEDNESDAY | **SGD/DISSECTION** | | **Break** | **PHYSIOLOGY (LGIS)** | | **PHYSIOLOGY (LGIS)** | | **Break** | Practical & SGD/CBL Topics & venue mentioned at the end | SDL Physiology Monocyte & Macrophage System |
| | Radiology, Surface Anatomy & Cross-Sectional Anatomy | | | reacti Disorders of temperature regulation (Fever, Heat stroke, Exposure of body to extreme cold) | Blood transfusion hazards. Tissue and organ transplantations | Disorders of temperature regulation (Fever, Heat stroke, Exposure of body to extreme cold) | Blood transfusion hazards. Tissue and organ transplantations | | | |
| | | | | Dr. Shazia (Odd) | Dr. Fahad (Even) | Dr. Shazia (Even) | Dr. Fahad (Odd) | | | |
| 29-08-2024 THURSDAY | **GYNAE OBS (LGIS)** | **PHYSIOLOGY SUPERVISED SDL)** | | **JOINT SESSION OF BASIC AND CLINICAL SEICINCES** | | | | | Practical & SGD/CBL Topics & venue mentioned at the end | SDL Biochemistry Immunoglobulins, iron |
| | Rh incompatibility and its significance | ABO & Rh Blood grouping system | | Thalasimia | | | | | | |
| | Dr. Shama (Even) / Dr. Ruqqia (Odd) | Dr. Shazia (Odd) / Dr. Fahad (Even) | | | | | | | | |
| 30-08-2024 FRIDAY | **8:00 AM – 9:00 AM** | **9:00 AM – 10:00AM** | | **10:00AM– 11:00AM** | | **11:00AM—12:00PM** | | SDL Anatomy Tonsil | | |
| | **BIO MEDICAL ETHICS** | **QURAN TRANSLATION** | | **PHYSIOLOGY SUPERVISED SDL** | | **BIOCHEMISTRY (LGIS)** | | | | |
| | **(CLUB ACTIVITY-3)** | Muaasharat-2 / Muaamlaat-4 | | Blood transfusion hazards. Tissue and organ transplantations | | Immunoglobulins | Iron | | | |
| | | Abdul Wahid (Even) / Mufti Naeem (Odd) | | Dr. Shazia (Even) | Dr. Fahad (Odd) | Dr. Rahat (Even) | Dr. Uzma (Odd) | | | |
| 31-08-2024 SATURDAY | **SGD/DISSECTION** | | **Break** | **BIOCHEMISTRY (LGIS)** | | Practical & SGD// CBLof 14th August batch Topics & venue mentioned at the end | | **Break** | Practical & SGD/CBL Topics & venue mentioned at the end | SDL Anatomy Gait Cycle Online Clinical Evaluation |
| | Dissection | | | Immunoglobulins | Iron | | | | | |
| | | | | Dr. Rahat (Odd) | Dr. Uzma(Even) | | | | | |

## Table No. 1 (Time: 12:20pm – 02:00pm)

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

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

Topics for Skill Lab with Venue

- Tonsils (Anatomy Histology Practical) Venue-Histology Laboratory (Dr. Kashif)
- Haemin crystals (Biochemistry Practical) Venue- Biochemistry Laboratory
- Recording of Body temperature (BT) (Physiology Practical) Venue – Physiology Lab

Schedule for Practical / Small Group Discussion

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

Topics for SGDs / CBL with Venue

- Physiology SGD- Physiological mechanism of temperature regulation (Venue: Lecture Hall No 5)
- Biochemistry CBL – iron (Lecture Hall No 2)

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

| **Batches** | **Roll No** | **Anatomy Teacher** | **Venue** |
|---|---|---|---|
| A | 01-90 | Dr Zeneara Saqib | New Lecture Hall Complex No. 02 |
| B | 91-180 | Dr. Sajjad Hussain | Anatomy Lecture Hall No.3 |
| C | 181-270 | Dr. Ali Raza | Anatomy Lecture Hall No.4 |
| D | 271- onwards | Dr. Qurat ul Ain | New Lecture Hall Complex No. 03 |
| Supervised by Prof. Dr. Ayesha Yousaf | | | |

## Table No. 3 Batch Distribution with Venues and Teachers Name for Problem Based Learning (PBL) Sessions & Biomedical Ethics Club Acitivity

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

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

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

**Schedule for LMS Based Weekly Online Assessments for First Year MBBS (Blood & Immunity Module)**

The online assessment for Blood & Immunity Module for First Year MBBS will be as per following schedule:

| Class | Module | Day & Date | Time of Assessment | Focal person | Department Responsible |
|---|---|---|---|---|---|
| First Year MBBS | Blood & Immunity Module | Monday 12th August ,2024 | 7:00 pm-7:30pm | Prof. Dr Ayesha Yousaf | Anatomy |
| | | Tuesday 13th August ,2024 | 7:00 pm-7:30pm | Prof. Dr Samia Sarwar | Physiology |
| | | Wednesday 15th August,2024 | 7:00 pm-7:30pm | Dr Aneela Jamil | Biochemistry |
| | | Monday 19th August,2024 | 7:00 pm-7:30pm | Prof. Dr Ayesha Yousaf | Anatomy |
| | | Tuesday 20th August,2024 | 7:00 pm-7:30pm | Prof. Dr Samia Sarwar | Physiology |
| | | Thursday 21st August,2024 | 7:00 pm-7:30pm | Dr Aneela Jamil | Biochemistry |
| | | Monday 26th August,2024 | 7:00 pm-7:30pm | Prof. Dr Ayesha Yousaf | Anatomy |
| | | Tuesday 27th August,2024 | 7:00 pm-7:30pm | Prof. Dr Samia Sarwar | Physiology |
| | | Thursday 28th August,2024 | 7:00 pm-7:30pm | Dr Aneela Jamil | Biochemistry |

## Blood and Immunity Module (Fifth Week)
## (02-09-2024 To 07-09-2024)

| Date/time | 9:00am - 12:00pm | 12:00-02:00pm |
|---|---|---|
| 02-09-2024 MONDAY | Assessment Week | |
| 03-09-2024 TUESDAY | | |
| 04-09-2024 WEDNESDAY | | |
| 05-09-2024 THURSDAY | | |
| 06-09-2024 FRIDAY | | |
| 07-09-2024 SATURDAY | | |

Note: Timetable Subject to Change According To The Current Circumstances

(Logistic details of Assessments will be notified separately)

## SECTION VII

# Table of Specification (TOS) For Blood & Immunity Module Examination for First Year MBBS

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

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

| Block | Subjects | LMS Based Assessment MCQs | | | | | OSPE | | | | | | Grand Total | Total Block Time |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | LabOSPE | IOSPE | COSPE | Total | Marks | Time | | |
| | | C | HV | S | Total | Time | C | HV | S | | | | | |
| BLOCK | Anatomy | 21 | 6 | 3 | 30 | 30 min | 14 | 4 | 2 | 20 | 60 | 6 HRS | 90 | 10 HRS |
| | Physiology | 21 | 6 | 3 | 30 | 30 min | 14 | 4 | 2 | 20 | 60 | 6 HRS | 90 | 10 HRS |
| | Biochemistry | 21 | 6 | 3 | 30 | 30 min | 14 | 4 | 2 | 20 | 60 | 6 HRS | 90 | 10 HRS |

50% Questions/OSPE Stations/Viva Stations will be from Foundation Module and 50% Questions will be from MSK-1 Module

For Each assessment student will have to individually pass Theory and Practical components

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

Marks per Item

| MCQ=1 | EMQ= 5 | SAQ= 5 | SEQ= 9 | AVOSPE= 5 | | OSPE= 3 |
|---|---|---|---|---|---|---|

OSPE Time=1 Round of 40 Students =80 min

3 Round of 40 Students =240 min

OSVE=Time per student=5mins

## Table of Specification for Gross OSPE

### Anatomy

| Block II- Lower Limb | | | | | |
|---|---|---|---|---|---|
| **1** | Bones and Joints of Hip and thigh Region | 30% | 50% | 20% | 3 |
| **2** | Muscles and Neurovascular of Hip | | | | 3 |
| **3** | Muscles and Neurovascular of Anterior and medial Compartment of Thigh | | | | 3 |
| **4** | Muscles and Neurovascular of Posterior Compartment of Thigh | | | | 3 |
| **5** | Bones and Joints of knee and leg | | | | 3 |
| **6** | Muscles and Neurovascular of Anterior Compartment of Leg | | | | 3 |
| **7** | Muscles and Neurovascular of Lateral and Posterior Compartment | | | | 3 |
| **8** | Bones and Joints of ankle and Foot | | | | 3 |
| **9** | Muscles and Neurovascular of Foot | | | | 3 |
| **10** | Radiology of Lower Limb | | | | 3 |
| | | | | **Total** | **30** |

## Table of Specification for Integrated OSPE

### Anatomy

| Block II- MSK-II and Blood & Immunity | | | | | |
|---|---|---|---|---|---|
| Development of Musculoskeletal System, vertebral column, and limbs | | | | | 3 |
| Development of Lymphoid Organs | 30% | 50% | 20% | | 3 |
| Microscopic anatomy of muscle and skin | | | | | 3 |
| Microscopic anatomy of Lymphoid Organs | | | | | 3 |
| Practical Copy | | | | | 3 |
| | | | | Total | 15 |

## Physiology

| Block – II (MSK-II & Blood Module) | | | | | | | |
|---|---|---|---|---|---|---|---|
| **1.** | Block – II (MSK-II & Blood Module) | Determination of Total leukocyte Count (TLC) | 30% | 50% | 20% | 1 A | 1 |
| **2.** | | Estimation of Red Blood Cell (RBC) count | | | | 1 B | 1 |
| **3.** | | Determination of platelet count | | | | 1 C | 1 |
| **4.** | | Determination of Differentiate leukocyte Count (DLC) | | | | 2 | 3 |
| **5.** | | Determination of ABO blood groups | | | | 3 A | 1.5 |
| **6.** | | Determination of Rh blood groups | | | | 3 B | 1.5 |
| **7.** | | Determination of Clotting Time (CT) | | | | 4 A | 1.5 |
| **8.** | | Determination of Bleeding Time (BT) | | | | 4 B | 1.5 |
| **9.** | | Recording of body temperature | | | | 5 A | 1.5 |
| **10.** | | Demonstration of Triple response | | | | 5 B | 1.5 |
| **11.** | | Practical notebook / sketch copy | | | | 6 | 3 |
| | | | | | | **Total** | **18** |

## Biochemistry

| | **Block – II (MSK-II & Blood Module)** | **Color test for amino acids(observed)** | | **90%** | **10%** | **1** | **2** |
|---|---|---|---|---|---|---|---|
| **1.** | Block – II (MSK-II & Blood Module) | Biuret test and ninhydrin | 100% | | | 2 | 2 |
| **2.** | | Quantitative estimation of serum total proteins | | | | 1B | 1 |
| **3.** | | Heat coagulation | 100% | | | 2A | 1 |
| **4.** | | Paper chromatography | | | | 2B | 1 |
| **5.** | | Blood draw technique | 100% | | | 3 | 2 |
| **6.** | | Quantitative estimation of serum bilirubin | 100% | | | 4 | 2 |
| **7.** | | Hemin crystal | | | | | |
| **8.** | | instruments | | 90% | 10% | 4 | 2 |
| **9.** | | Practical notebook | | 80% | 20% | 5 | 2 |
| | | | | | | **Total** | **10** |

# Annexure I

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

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

**RAWALPINDI MEDICAL UNIVERSITY, RWP**
**ANATOMY DEPARTMENT**
**1st Year MBBS MCQs Module Exam (BLOOD & IMMUNITY)**

1. A 21-year-old boy had a motorcycle accident. On x-ray groove in the lower surface of the cuboid bone was destroyed. Which of the following muscle tendons is most likely damaged?

a. Flexor hallucis longus
b. Peroneus brevis
c. Peroneus longus
d. Tibialis anterior
e. Tibialis posterior

**Note: MCQs on USMLE Pattern**

2. A professional runner without any history of trauma complaint of pain in the sole of foot and heel. The pain was aggravated during start of walk and after sitting but relieved after 5-10 minutes of activity. His condition could be due to

a. Deep infection of the foot
b. Plantar fasciitis
c. Fatigue
d. Arthritis of ankle joint
e. Sprain of the ankle joint

**Note: MCQs on USMLE Pattern**

3. A patient reported to hospital with the complaint of difficulty in walking and pain in the left leg. He gave history of an audible snap during a forceful push-off emergency car breaks (plantarflexion with the knee extended). It was followed immediately by sudden calf pain and dorsiflexion of the foot. He might be suffering from?

a. Calcaneal tendinitis
b. Ruptured calcaneal tendon
c. Gastrocnemius strain
d. Common peron

**Note: MCQs on USMLE Pattern**

4. During medical examination, students were asked to examine patient with “tarsal tunnel syndrome”. Which of the following symptoms are commonly associated with this?

a. Sharp pain radiating down the front of the thigh.
b. Tingling and numbness along the lateral side of the foot.
c. Weakness during ankle joint extension
d. Burning sensation along the inner side of leg and sole of the foot.
e. Flattening of lateral arch of the foot

5. Student of first year was asked to auscultate the posterior tibial pulse during assessment. While auscultating which landmarks are important?

a. Between lateral malleolus and medial border of calcaneal tendon
b. Between medial malleolus and medial border of calcaneal tendon
c. Between lateral malleolus and lateral border of calcaneal tendon
d. Between 1st and 2nd metatarsals
e. Between 2nd and 3rd metatarsals

**RAWALPINDI MEDICAL UNIVERSITY, RWP**
**ANATOMY DEPARTMENT**
**1st Year MBBS SEQs Module Exam (BLOOD & IMMUNITY)**

Q. 1 .A patient presents with an enlarged spleen (splenomegaly), and a histological examination is requested to understand the underlying changes.

a. How would you assess the histological changes in the spleen associated with splenomegaly? (3)

b. What alterations might you expect in the red pulp and white pulp of the spleen in response to splenomegaly? (3)

c. How would you differentiate between reactive hyperplasia and pathological changes in the splenic tissues? (3)

Q. 2. What specific histological features would indicate the presence of an underlying disease, such as infections or hematological disorders, in the context of splenomegaly? A patient presents with swollen lymph nodes, and a biopsy is performed to investigate the cause of lymphadenopathy. The histological examination reveals atypical findings.

a. What histological features should be examined to determine the cause of lymphadenopathy? (3)

b. What specific histological changes might you expect in the lymph node if the cause of lymphadenopathy is an infection? (3)

c. How can you differentiate between reactive lymphadenopathy and malignant conditions, such as lymphoma, based on histological features? (3)

**RAWALPINDI MEDICAL UNIVERSITY, RWP**
**PHYSIOLOGY DEPARTMENT**
**1st Year MBBS MCQs Module Exam (BLOOD & IMMUNITY)**

1. Maintenance of blood viscosity is mainly a function of :
   a. Plasma proteins
   b. Erythocytes
   c. Thrombocytes
   d. Albumin
   e. Gamma globulins

2. The HIV virus mainly targets the immune cells which are back bone of cell mediated immunity , these cells are:
   a. B-cells
   b. Cytotoxic T cells
   c. Helper T cells
   d. Memory cells
   e. Suppressor T cells

3. A Rh-negative mother having her second pregnancy terminated because of fetal death due to Rh-incompatibility, the type of agglutinin involved in this case would be:
   a. 1gM
   b. 1gG
   c. 1gE
   d. 1gA
   e. 1gD

**Note: MCQs on USMLE Pattern**

4. Thalasemic children usually suffer from iron over load. Insoluble storage form of iron secondary to iron-overload is termed as:
   a. Ferritin
   b. Apoferritin
   c. Hemopexin
   d. Hemosiderin
   e. Ferroheme

**Note: MCQs on USMLE Pattern**

5. When blood is allowed to clot, the fluid left behind is known as :
   a. Plasma
   b. Lymph
   c. Tissue fluid
   d. Tissue gel
   e. Serum

**RAWALPINDI MEDICAL UNIVERSITY, RWP**
**PHYSIOLOGY DEPARTMENT**
**1st Year MBBS SEQs Module Exam (BLOOD & IMMUNITY)**

| | | |
|---|---|---|
| Q.1 | Discuss three different causes of anemia and what is obligatory degradation of proteins and how it can be prevented? | (3,2) |
| Q.2 | Define Immunity. What are different classifications of granulocytes (write any two). Write four causes of neutrophilia? | (1,2,2) |
| Q.3 | Define Land Steiners Law, Secretors and non- Secretors. Write down briefly on Incompatible blood transfusion, stating two complications of incompatible blood transfusion. | (3,2) |

**RAWALPINDI MEDICAL UNIVERSITY, RWP**
**BIOCHEMISTRY DEPARTMENT**
**1st Year MBBS SEQs Module Exam (BLOOD & IMMUNITY)**

1. Iron is transported in the body in the form of:
    a. Ferritin
    b. Hemosiderin
    c. Transferrin
    d. Hemoglobin
    e. Myoglobin

2. The normal serum value for total bilirubin is up to:
    a. 10mg/dl
    b. 5mg/dl
    c. 50mg/dl
    d. 1mg/dl
    e. 15mg/dl

3. Chocolate cyanosis is a classic presentation of
    a. Thalassemia
    b. Hemoglobin SC disease
    c. Hemoglobin C disease
    d. Sickle cell anemia
    e. Methemoglobinemia

4. Vitamin K is required for
    a. Change of prothrombin into thrombin
    b. Synthesis of prothrombin
    c. Change of fibrinogen into fibrin
    d. Formation of thromboplastin
    e. Fibrinolysis

**SEQ**

Q. a. Explain the functions of Albumin (2)

b. Give clinical significance of Albumin. (1)

b. Describe pathway of synthesis of heme. (2)

Types of Anemia:

A. Iron-deficiency anemia

B. Vitamin B12 deficiency anemia

C. Aplastic anemia

D. Hemolytic anemia

E. Sickle cell anemia

F. Thalassemia

Descriptions:

This type of anemia is characterized by a lack of mature red blood cells due to the bone marrow failing to produce them.

Commonly caused by inadequate intake or absorption of a crucial mineral, resulting in small and pale red blood cells.

Caused by premature destruction of red blood cells, leading to a shortage of these cells in circulation.

Occurs due to a deficiency in a key vitamin required for DNA synthesis, affecting red blood cell production and neurological function.

Inherited disorder where red blood cells become crescent-shaped and rigid, leading to blockages in blood flow and oxygen delivery.

Genetic condition resulting in reduced synthesis of hemoglobin, leading to abnormal red blood cell formation and anemia.

Matching:

Type A:

Type B:

Type C:

Type D:

Type E:

Type F:

Feel free to match them accordingly:

Type A: C (Aplastic anemia)

Type B: A (Iron-deficiency anemia)

Type C: D (Hemolytic anemia)

Type D: B (Vitamin B12 deficiency anemia)

Type E: E (Sickle cell anemia)

Type F: F (Thalassemia)

**RAWALPINDI MEDICAL UNIVERSITY, RWP**
**BIOEHTICS DEPARTMENT**
**1st Year MBBS MCQs Module Exam (BLOOD & IMMUNITY)**

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

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

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

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

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

## Rawalpindi Medical University Department of Anatomy

### Block-II OSPE 1st Year MBBS

**Station No. 1 (Observed Station)**

Histology sketch copy will be assessed for

a. Complete index (1)

b. Complete and signed diagrams (1)

c. 2 ID points mentioned with each diagram (1)

d. Punctuality (1)

e. Neatness (1)

**Station No. 2 (Gross Anatomy)**

Core Concept - Learning Domain (C2)

I. On the cadaver/model,

a. Identify Red (1)

b. Identify Yellow (1)

c. Identify Green (1)

## Rawalpindi Medical University Department of Physiology

### Block-II OSPE 1st Year MBBS

**Station No.1** Time Allowed: 2 Minutes

a. What is the preferred dilution ratio for RBC count & platelet count? (0.5, 0.5)

b. Write the composition of Hayem's Fluid. (1)

c. How would you interpret a platelet count of 80,000 /$mm^3$? (1)

**Station No.2** Time Allowed: 2 Minutes

a. Identify the cells labeled A & B. (0.5)

b. Points of Identification. (1.5)

c. What is the power of objective lens used for identifying the cells and how much (0.5, 0.5)
was the total magnification achieved?

**Rawalpindi Medical University Department of Biochemistry**
**Block-II OSPE 1st Year MBBS**

**Station No. 2** Time Allowed: 2 Mins

**Observed station**

Perform Biuret test 03

**Station No. 1** Time Allowed: 2 Mins

**Observed Station**

Perform Lead Sulfide test. 03

**OSPE**
**DEPARTMENT OF ANATOMY**

**Section I: Core Concept**
**A. Gross Anatomy**

**Station No. 1** **Time Allowed: 3mins**

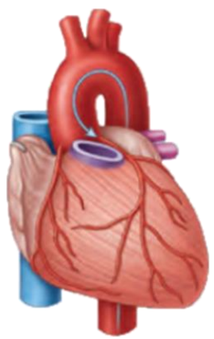
I. Identify Red on model/ cadaver (1)
II. Identify Green & name the most common artery involved in Myocardial Infarction (1)

**Station No. 1 Key**

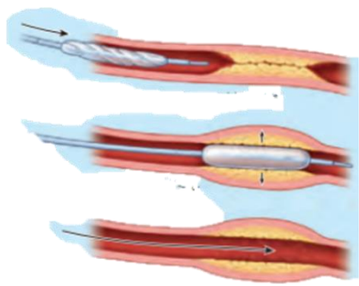
I. Coronary Sinus
II. Posterior Interventricular artery & LAD /LCA

## C.Vertical Integration (Cardiology)

**Station No. 15** **Time Allowed: 3mins**



Look at the picture given below



I. Identify the procedure in the given image. (0.5)
II. Name any one indication for this procedure (0.5)
III. Give 2 sites of cardiac catheterization (01)

**OSPE**
**DEPARTMENT OF BIOCHEMISTRY**

## Station 1 (Core Concept - Skill Based)

Q1. What is the shape of haemin crystal? 1.5

Q2. What is the medicolegal importance of haemin crystal test? 1.5

## Key Station 1 (03 Marks)

1. Rhombic shape 1.5
2. It can be used to differentiate between red stain and blood. 1.5

**AV OSPE**
**DEPARTMENT OF ANATOMY**

**Slide 1**

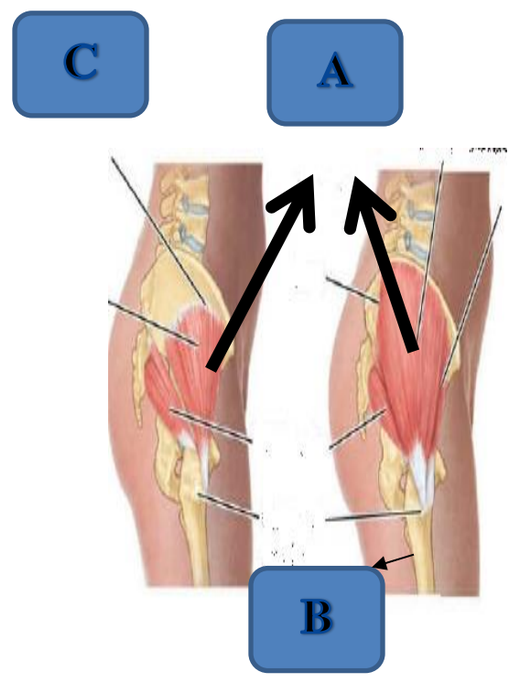
**Total Marks:** 05 marks

**Time Allotted:** 05 minutes

**Requirements:** Answer sheet, Pen

**Objectives:** _____

**Gross Anatomy**




I. Identify **(3)**
   A
   B
   C.
II. What is the nerve supply of structure A. **(1)**
III. Name the clinical condition which results due to paralysis of structure A. **(1)**

**AV OSPE**
**DEPARTMENT OF ANATOMY**

**Slide 1**

**Total Marks:** 05 marks

**Time Allotted:** 05 minutes

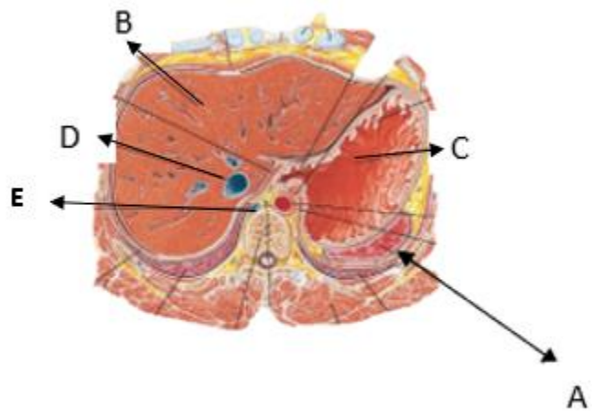
**Requirements:** Answer sheet, Pen

**Objectives:** _____

**Cross Sectional Anatomy**

Idetify

A
B
C
D
E



**AV OSPE**
**DEPARTMENT OF BIOCHEMISTRY**

**Slide 1**

**Total Marks:** 05 marks

**Time Allotted:** 05 minutes

**Requirements:** Answer sheet, Pen

**Objectives:** _____

Q1. What is the name of clinical condition shown in the above image? 01

Q2. What are different types? 01

Q3. causes of this condition. 01

Q4. Give Normal value of Serum bilirubin? 01

Q5. What is Kernicterus? 01