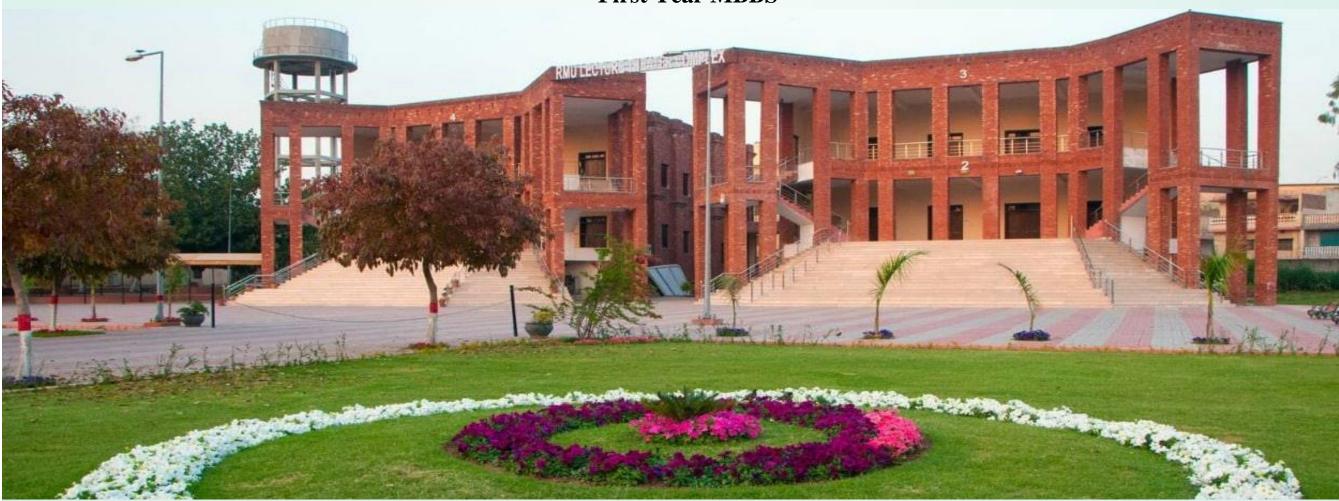
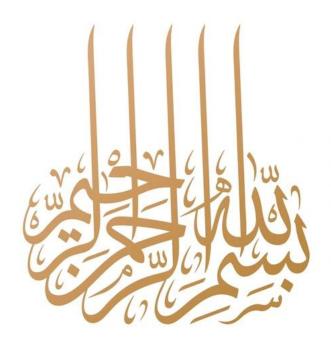


Rawalpindi Medical University Clinically Oriented Integrated Modular Curriculum 2024 First Year MBBS





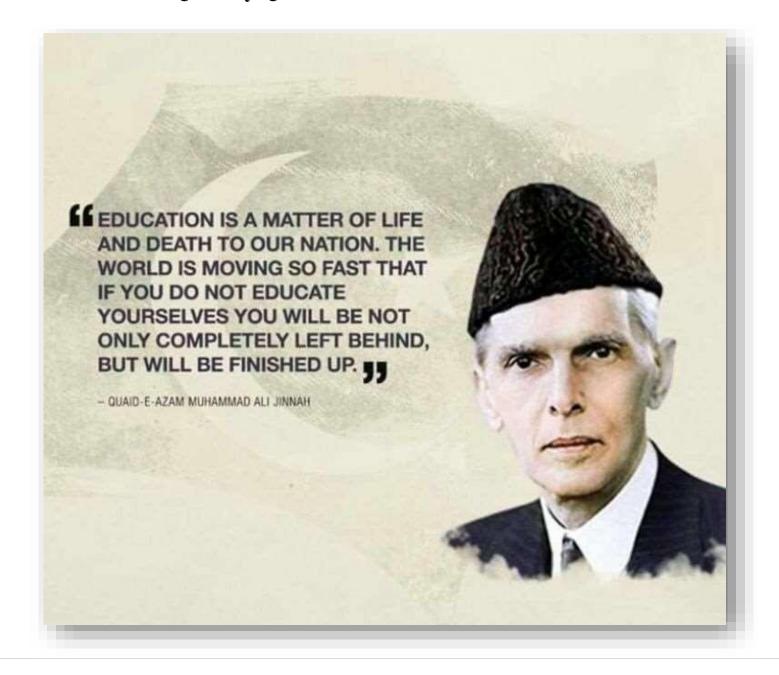
Dedicated to Hazrat Muhammad (S.A.W)



1st Year MBBS Clinically Oriented Integrated Modular Curriculum 2024

Revised September 2024

Quote by Quaid-e-Azam Muhammad Ali Jinnah





Sardar Saleem Haider Khan

Governor Punjab

It is with great pleasure that I extend my congratulations to Rawalpindi Medical University on the introduction of its Integrated Curriculum. This progressive step reflects the university's commitment to shaping the future of medical education in Pakistan, ensuring that our future healthcare professionals are equipped with the skills and knowledge needed to meet the evolving demands of healthcare, both locally and globally.

The integrated curriculum represents a significant shift in how medical education is delivered, focusing on the interconnection between various disciplines and emphasizing patient-centered care. By blending theoretical knowledge with practical application from the early stages of their education, students are better prepared to understand the complexities of human health and the diverse challenges they will face in their medical careers. This holistic approach is criticalin nurturing well-rounded professionals who are not only adept clinicians but also compassionate caregivers.

Rawalpindi Medical University has always been at the forefront of medical education, and this curriculum reflects its visionary leadership in preparing graduates who are ready to confront the future of healthcare with confidence and competence. I am confident that this initiative will greatly contribute to the advancement of healthcare in Punjab and beyond, ensuring that our doctors are not only skilled but also compassionate and ethical leaders in their field.



Mr. Khawaja Salman Rafique

Minister, Specialized Healthcare & Medical Education Department

The Rawalpindi Medial University, Rawalpindi has consistently evolved and adapted to support its learners, uphold academic standards, and maintain its status as a globally recognized institution. The launch of the 'Modular Curriculum 2024 marks a significant step forward in advancing public health and addressing future healthcare needs. By embracing this curriculum, students and professionals alike will gain the toolsto turn knowledge into practical expertise, positioning themselves as leaders in research, public service, sustainable healthcare, and accessible medical care.

A curriculum's success hinges on the dedication of those who implement it. The true impact of this program will be realized through the joint efforts of educators and learners. I am confident that this integrated educational framework will equip our futuredoctors to confront global health challenges, including emerging disease trends, healthcare equity, and solutions for underserved communities.



Prof. Dr. Muhammad UmarVice Chancellor RMU



Prof Jahangir Sarwar KhanPrincipal RMC

There is no subject which will require more careful consideration in the settlement of the educational details of the University of which RMU is to be the center than that of the choice andarrangement of the curriculum to be required for the degree in medicine. An exceptional opportunity presents itself, you have, within certain limits, a tabula rasa, and it behooves the authorities of the future university to mark it in the manner best calculated to promote the advanceof medical science and the efficiency of medical teaching. If, from an experience acquired as a teacher and examiner in various universities during a period of more than a quarter of a century, I can help in the promotion of these objects, by pointing out virtues which may be emulated here, and failings which may be avoided there. I shall at least feel I have done something to assist in the modelling of what will, we all hope, become one of the great centers of learning of Pakistan.

But whilst endeavoring to sketch out what subjects should form part of the medical curriculum of a university, and to appraise their relative order and value, I do not propose to place before youan ideal which is unattainable under the circumstances of place and time, in which you find yourselves, although it would be easier to construct an ideal curriculum than to plan one out within the limits of present-day practicability. I suppose that the integrated modular curricula nowbeing established in our university will more nearly approach the ideal.

The diverse faculty and student body make our programs earn top national and international reputation. I can say with complete confidence that what makes our university exceptional are the faculty & staff who are dedicated to help our aspiring students to become the compassionate, highly skilled health-care providers of tomorrow.



Prof, Dr. Ifra SaeedProfessor of Anatomy
Director DME



Prof, Dr. Ayesha YousafDean Basic Sciences

This is a great prospect for RMU and curriculum committee to formulate the modular curriculum of basic medical sciences. It is a task, well meant for its contribution in medical education. Hopefully it will go a long way in training the medical graduates, as per required national and international standards of medical education. The Modular teaching is likely to give a fresh and varied approach to learning process and at the end optimizing maximum learning outcomes. This entails coordination, patience, commitment and diligence from all those who are on board, either the faculty or the students. All this seems to be encouraging, yet limited resources, inadequate manpower, and difficulty in breaking traditional shackles are tangible obstacles.

The preparation and implementation of modular curriculum provides the faculty an opportunity to design and reorientate and reconceptualize health—illness process.

Transforming academic stakeholders' learning perspectives and then to translate it in students' development as an effective force of society, well versed with modern day problems, is an uphill task. This is a humble effort in this regard. Still there is lot to distill, crystallize and narrate. Hopefully from this marathon, the curiosity will emerge like a fresh breeze, from here the character will arise in the horizon, as all this at the end is meant to serve the ailing humanity and to accomplish the dream of a healthy society.

At the end, it will be great injustice not to acknowledge the unwavering and untiring support of Prof Dr Muhammad Umar, Vice Chancellor RMU, who is an ardent supporter and promoter of anything which gives a fresh impetus to medical education and practice. It's all because of his continuous input and persuasion, that the modular curriculum achieved fruition.

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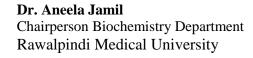


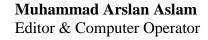


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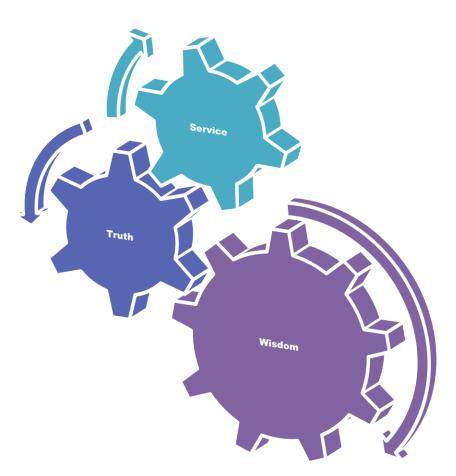






University Moto, Vision, Values & Goals

RMU Motto



Vision and Values

Highly recognized and accredited center of excellence in Medical Education, using evidence-based training techniques for development of highly competent health professionals, who are critical thinkers, experiential self-directed lifelong learners and are socially accountable

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.

Outcomes 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 evidence-based knowledge to help you attain personal and professional growth & excellence.

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Dr Tehzeeb, Dr Samia Sarwar, Dr Ifra Saeed, Dr. Ayesha Yousaf, Dr Tehmina Qamar, Dr Sidra Hamid	2019-2020	2 nd	Developed for First & Second MBBS. Horizontally and vertically integrated Learning objectives updated
Dr Tehzeeb, Dr Samia Sarwar, , Dr Ifra Saeed, Dr Ayesha Yousaf , Dr Tehmina Qamar, Dr Sidra Hamid	2021-2022	3 rd	Developed for First & Second MBBS. Horizontally and vertically integrated Learning objectives updated, Research curriculum incorporated
Dr Tehzeeb, Dr Samia Sarwar, Dr Ifra Saeed, Dr Ayesha Yousaf, Dr Tehmina Qamar, Dr Sidra Hamid	2022-2023	4 th	Developed for First & Second MBBS. Horizontally and vertically integrated Learning objectives updated, Research, Bioethics, Family Medicine curriculum incorporated along with Professionalism
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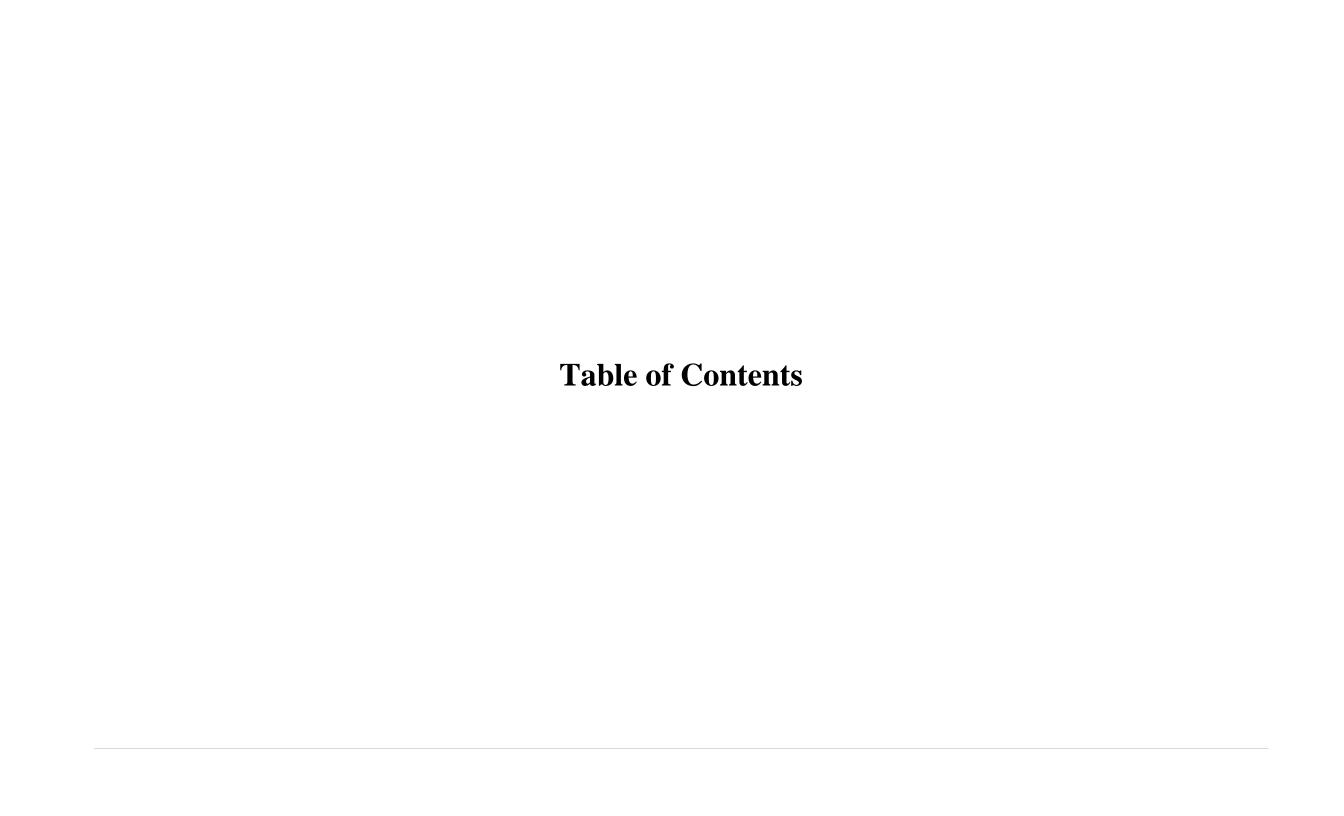


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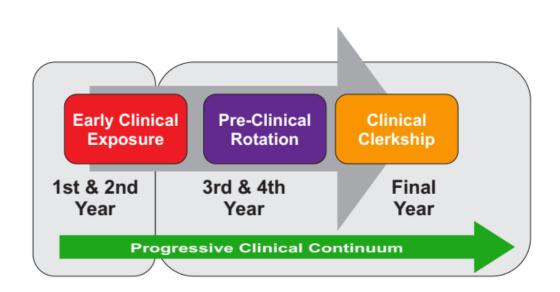
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Dr. Bushra Farooq PGR		Assistant Prof. Dr. Sadia Azam Khan
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SECTION-II

Foreword to Curriculum 2024

- Introduction
- Levels of Integration
- PMDC Seven Star Doctor Competencies
- Contextualization in the curriculum
- Context Facets of Curriculum 2024 at Rawalpindi Medical University
- Process of Curriculum Development
- Curricular Organization and Structure



Integrated Curriculum Design

Introduction

Welcome to the fourth edition of the Clinically Oriented Integrated Modular Curriculum for the MBBS students at Rawalpindi Medical University. This revised version is tailored to integrate clinical insights from the very beginning, ensuring a more practical and application-focused approach to the fundamental medical sciences. At Rawalpindi Medical University, we are committed to providing a curriculum that not only covers the essential theoretical knowledge but also emphasizes the development of critical clinical skills necessary for future medical professionals. This curriculum is designed to foster a deep understanding of human biology and the pathophysiological processes, combined with hands-on clinical experiences that contextualize theoretical knowledge in real-world medical settings.

Version IV of the curriculum incorporates the latest advancements in medical education and reflects changes in the medical landscape, ensuring our students are well-prepared to meet the challenges of modern healthcare environments. With a focus on interdisciplinary learning and ethical practice, we aim to equip our students with the competence and compassion required to excel in their future careers.

We trust that this curriculum will inspire and challenge you to reach new heights in medical education and beyond. Welcome to a journey of learning that promises to be as rewarding as it is demanding.

What is curriculum?

According to definition curriculum can be classified into five categories:

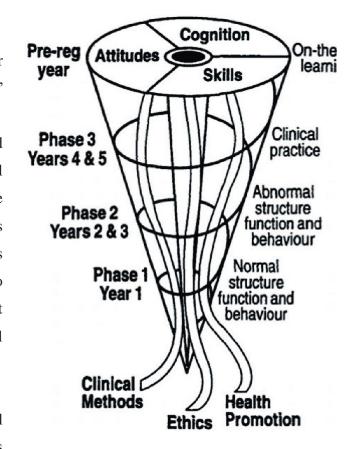
- 1. Curriculum as a product program, document, electronic media, or multimedia
- 2. Curriculum as a program of study usually courses offered, curriculum sequences of study instandards as benchmarks, gateways,
- 3. Curriculum as intended learnings goals, content, concepts, generalizations, outcomes
- 4. Curriculum as experiences of the learner activities, planned and unplanned.
- 5. Hidden curriculum what students learn that isn't planned unless you plan for this or is itpossible?

What is a Integrated Medical Curriculum?

Shoemaker defines an integrated curriculum as "education that is organized in such a way that it cuts across subject matter lines, bringing together various aspects of the curriculum into meaningful association to focus upon broad areas of study." There is an ongoing discussion aboutwhether medical curriculum should be discipline based or integrated.

Most curricula for medical education have been integrated horizontally and vertically—vertically between basic and clinical sciences. The Flexnerian curriculum has disappeared to permit integration between basic sciences and clinical sciences, which are taught throughout the curriculum. We have proposed a different form of integration where the horizontal axis represents the defined learning outcomes and the vertical axis represents the teaching of the sciences throughout the courses. We believe that a mere integration of basic and clinical sciences is not enough because it is necessary to emphasize the importance of humanism as well as health population sciences in medicine. It is necessary to integrate basic and clinical sciences, humanism, and health population in the vertical axis, not only in the early years but also throughout the curriculum, presupposing the use of active teaching methods based on problems or cases in small groups.

The method of teaching medicine, since Flexner's days, implies that students should first learn basic and biomedical sciences and then move to clinical sciences; however, this is not how patients are presented. A common criticism of this approach is that students will not see the relevance of basic and biomedical sciences applied to clinical practice, and it is preferable to encourage students to think as doctors from the day they enter medical school.



A Spiral Curriculum

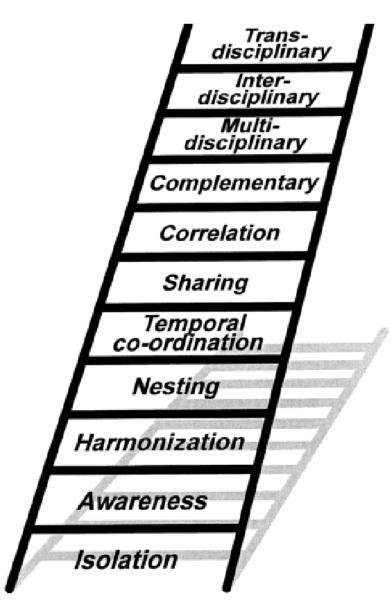
Integration is therefore of key importance for medical education because basic science learning isplaced in the context of clinical and professional practice and is considered by students to be moremeaningful and relevant. In the vast majority of curriculum reforms, vertical integration combines basic and clinical sciences, early clinical experience, clinician—scientist partnerships, and incorporation of sciences in the later years of the course. This is undoubtedly an advantage, but is based on a biologist's vision of the health-illness process

Levels of Integration

At Rawalpindi Medical University, our curriculum for the MBBS program adheres to the sophisticated model of Correlation, recognized as level 7 on Harden's scale of integration. This approach is foundational throughout the initial four years of the medical education journey. Our emphasis predominantly remains on discipline-specific education, where courses focused on individual subjects constitute the majority of the curriculum. This traditional structure ensures a robust foundation in the core medical sciences.

Within this discipline-oriented framework, we introduce an innovative element—an integrated teaching session. These sessions are strategically designed to bridge various subjects by identifying and connecting areas of mutual relevance. This method facilitates a holistic learning experience by correlating distinct disciplines and embedding them within a clinical context. This integration enhances the students' understanding and application of medical concepts, making the learning process both comprehensive and applicable to real-world scenarios.

As our students progress through their education, the degree of clinical teaching intensifies. This gradual increase is deliberate, ensuring that by the time our students reach their final year, they are well-prepared to engage in extensive clerkships. Year V is exclusively devoted to these clerkships, offering students hands-on, practical experience in a variety of clinical settings. This exposure is crucial for the development of competent and empathetic future physicians who are equipped to meet the diverse needs of their patients and the healthcare system at large.



Harden's Integration Ladder

PMDC Seven Star Doctor Competencies

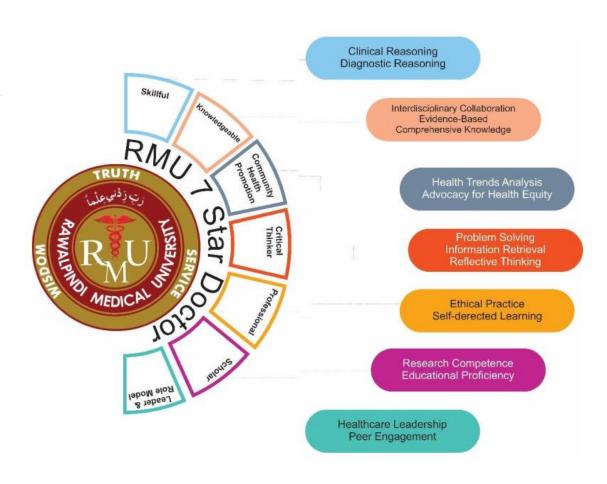
At RMU we aim to produce seven-star doctor according to PMDC Competencies having the generic competencies of "Skill,Knowledge, Community Health Promoter, Critical Thinker, Professional, Scholar, Leader and Role Model", Rawalpindi Medical University has introduced modular integrated undergraduate curriculum as being first public sector university. These competencies are further outlined by various enabling traits specifying knowledge, skills, and attitude.

Contextualization in the curriculum

It involves incorporating both local needs and global standards. This ensures the curriculum's relevance to the local community while adhering to international benchmarks. For health professionals, this is crucial as it equips students to effectively serve diverse populations in real-world healthcare settings.

Content identification, contextualization, and validation during curriculum development require a balanced consideration of local and global requirements, overseen by relevant leaders and experts. To this end, Rawalpindi Medical University has engaged subject experts and medical educationists, planning to incorporate feedback from local stakeholders to address the current needs effectively.

In Pakistan, the shift towards contextualization is essential, particularly due to the country's unique healthcare challenges like infectious diseases, malnutrition, and maternal and child mortality, compounded by socioeconomic factors. The prevalence of various diseases, limited healthcare resources, and cultural diversity necessitate a customized approach to medical education.



RMU 7 Star Doctor

Contextualizing the curriculum is expected to positively influence graduate performance. By blending basic and clinical subjects, introducing early clinical exposure, and emphasizing practical, context-aware learning, graduates will be better equipped to tackle health challenges in their communities, enhancing their competence, confidence, and ability to deliver high-quality healthcare.

Context Facets of Curriculum 2024 at Rawalpindi Medical University

Rawalpindi Medical University adheres to globally recognized best practices in curriculum development. The Department of Medical Education at RMU has structured the process of syllabi identification, thematic structuring, content validation, and contextualization. This process integrates existing teaching and learning practices with global recommendations for change.

Key perspectives for the context of change include:

- •The exponential growth in course content due to educational advancements, technological innovations, and scientific discoveries requires prioritization, removal of outdated concepts, and modern information transfer methods.
- •Evolving societal expectations of healthcare workers necessitate balancing patient satisfaction with health system responsiveness. The curriculum should address societal needs, healthcare access, resource equity, and system awareness.
- •The post-pandemic era's shift towards hybrid learning and online methodologies necessitates a curriculum that accommodates these new educational paradigms.
- •The curriculum revision is aligned with global standards of Basic Medical Education and conforms to national regulations, ensuring international recognition and employability.
- •The curriculum incorporates training in the affective domain to address societal expectations, legal awareness, and community interaction. This includes a dedicated 'spiral' for affective training, with assessments for the 'PERLs' domain.
- •Student-centered approaches, such as Problem-Based Learning, electives, self-directed learning, and portfolio development, empower students in their educational journey.

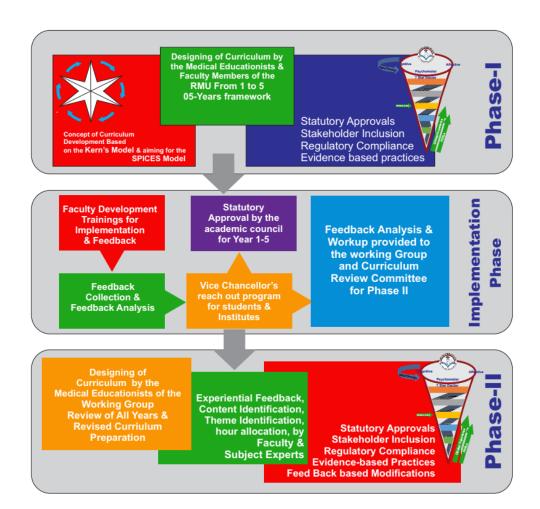
Process of Curriculum Development

The curriculum development process at Rawalpindi Medical University was an intricate and well-orchestrated endeavor, meticulously designed to create an advanced and relevant curriculum. This process maintained a strong linkage with existing educational norms and professional practices while introducing innovative elements. Here's a more detailed breakdown of the process:

- 1. **Syllabi Development and Expert Consultation**: The first stage involved the formation of subject-specific advisory committees, engaging over 34 experts. Each committee focused on curating and refining the syllabi for their respective subjects. Their primary task was to incorporate all critical elements pertinent to each subject while discarding any obsolete or irrelevant content.
- 2. **Curricular Committee Review**: The next phase brought together a 26-member Curricular Steering Committee, consisting of medical educationists This committee played a pivotal role in scrutinizing and endorsing the overarching structure for a 'Modular Integrated Curriculum' spanning five years. Their focus areas included the identification and placement of modules, clerkship planning, and ensuring that the curriculum aligned seamlessly with various assessment techniques.
- 3. **Theme Identification and Modular Design**: In this phase, 18 medical educators engaged in a dynamic and collaborative exercise. They meticulously arranged syllabi elements into specific modules according to these themes. This step was crucial in determining the topics for each learning objective and allocating appropriate hours for each curriculum component.

- 4. Finalization of Modules: A select group comprising Lead Medical Educationists and members from the Department of Medical Education undertook the final step of module finalization. This involved setting the structure, themes, time allocation, syllabi content, and emphasizing clinical relevance for each module.
- 5. Statutory Approval and Integration: The finalized modules and their associated assessment policies underwent a rigorous approval process through the Academic Council, and the Syndicate. Feedback and recommendations gathered during this statutory process were meticulously integrated into the curriculum guidelines.
- 6. Adaptive and Feedback-Oriented Approach: Recognizing the importance of adaptability and continuous improvement, the university incorporated a system for regular feedback and curricular evaluations. This system ensures that the curriculum remains dynamic, accommodating necessary updates and refinements as needed.
- 7. Curriculum 2024 A Modular Integrated Outcome-Based Approach: The developed Curriculum is a testament to a comprehensive, outcome-based educational strategy. This strategy enables affiliated colleges to implement the curriculum effectively, respecting each institution's unique identity and vision, despite variations in available resources.
- 8. Integrative and Contemporary Educational Strategies: The curriculum emphasizes both horizontal integration across various disciplines and vertical integration throughout different educational stages. This integrative approach is in line with modern educational theories, like Meizrow's concept of transformative learning and strategies

for early clinical exposure. Such an approach is aimed at promoting professional growth and practical knowledge application among students.



Phases of Curriculum Development

In essence, the curriculum development at Rawalpindi Medical University was a detailed, step-by-step process involving extensive expert input, iterative refinement, and a focus on adaptability and modern educational practices

Curricular Organization and Structure

RMU will follow the Correlation approach, corresponding to level 7 of Harden's levels of integration. The emphasis remains on disciplines or subjects, with subject-based courses occupying most of the curriculum time. Within this framework, an integrated teaching session or course is introduced, in addition to the subject-based teaching. This session brings together areas of interest common to each of the subjects. Although the teaching is discipline-based, topics are correlated and taught within a clinical context for better understanding and application of concepts. However, clinical teaching increases gradually with advancing years. The fifth year of the MBBS program is dedicated to clerkships.

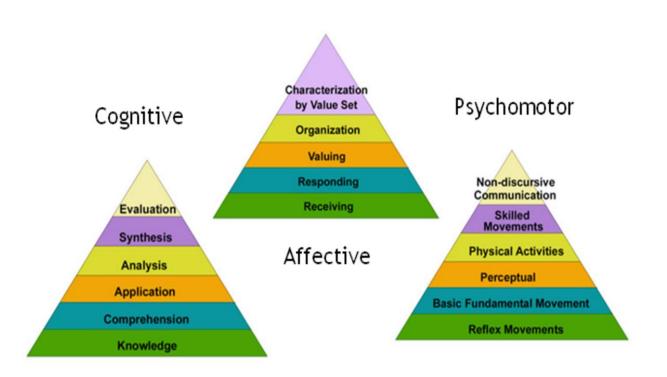
Integrated Curriculum Design of RMU MBBS Program

Two designs of the MBBS curriculum are acceptable by PMDC. System Based (Preferred) with horizontal and vertical integration. The curriculum of each Clinical Discipline must emphasize-Health Promotion and Disease Prevention^{||}, besides Curative Health Care. RMU has opted for system based modular curriculum.

The Module: Module is the smallest unit of Curriculum both in the System-Based and Subject-Base (topic-based) Curricula. Modules are taught as a continuous block or as a longitudinal theme and assessments is carried out at the end of each module. The System-Based Curriculum made up of —Modules, where each module is based upon organ-system(s) of the body. In each module, the Basic and Clinical Sciences are taught and learned in an integrated manner.

Components of a Module:

1)Title of Module/System 2) Learning Objectives, 3) Allocated Time in weeks/Hours and Credit Hours, 4) the name of the Coordinator, 5) Teaching Faculty (regular/visiting) 6) Learning Sites, 8) Modes of Information Transfer, 9) List of the Recommended Books, 10) Assessment strategies, and 11) Strategies for Monitoring and Improvement.



Integrated Curriculum Design

Learning Objectives: Learning Objectives are defined for each module. They are Specific, Measurable, Achievable, Relevant to the desired competencies (Outcomes) of the PMDC Curriculum and Time bound (SMART), related to level of the learner and the three main domains.

Level of the Learner: While developing the curriculum, the learning objectives are according to the desired level of the learner, and formative and summative assessment is done to assess the knowledge, skills and attitudes to be achieved for that level.

Roles and Responsibilities:

- a. The RMU MBBS curriculum in the first four years is delivered in a System-Based Modular Format with clinical relevance and early clinical Exposure. However, in the third and fourth years, students will gain clinical exposure through rotations in the wards and outpatient departments (OPDs), and in the fifth year through clerkships.
- b. The curriculum is delivered by modular teams consisting of multidisciplinary basic science faculty and relevant clinical faculty.
- d. The planning and delivery is coordinated by Module Team who will guide module coordinators of their respective modules for efficient implementation.
- e. The Modular Coordinator is responsible for teaching and assessment during each module. The coordinator will be appointed by the Heads of Departments (HODs) in coordination with the Health Professions Education (HPE) team.
- f. The Clinical Coordinator is responsible for placement, teaching, and assessment during clinical rotations



RMU Undergraduate Curriculum Competency Framework

- Undergraduate Competency Model
- Outcomes of the Curriculum

Competence refers to the ability of a medical student or professional to perform tasks or roles to a defined standard in a real-world setting. It encompasses the integration of knowledge, skills, behaviors, and attitudes required to deliver effective patient care. Competence is often described in terms of observable behaviors and is measured at various stages of medical education, ensuring that learners are capable of safely applying their training in clinical practice.



Competency Framework

RMU Undergraduate Competency Model

The Rawalpindi Medical University (RMU) Undergraduate Competency Model is designed to prepare medical students to meet the evolving challenges of modern healthcare. Grounded in the principles of patient-centered care, ethical practice, and community engagement, this model outlines the core competencies that every RMU graduate must attain. These competencies are carefully aligned with the needs of Pakistan's healthcare system and the broader global context, ensuring that RMU graduates are not only skilled clinicians but also ethical leaders, compassionate caregivers, and innovative problem-solvers.

The RMU Undergraduate Competency Model emphasizes a holistic approach to medical education, integrating scientific knowledge with practical skills, critical thinking, and a deep commitment to lifelong learning. Each competency is complemented by specific sub competencies that provide a clear roadmap for students' development, guiding them from foundational knowledge to advanced clinical practice.

Through this competency-based framework, RMU aims to cultivate graduates who are capable of delivering high-quality, safe, and effective care, while also advancing the health and well-being of the communities they serve. By adhering to these competencies, RMU students will be equipped to excel in diverse medical environments, adapt to the rapidly changing landscape of healthcare, and contribute positively to the society they serve.

Competency 1: Patient Care Deliverer

The "Patient Care Deliverer" competency focuses on the practical aspects of delivering patient care. It emphasizes the importance of applying clinical skills, knowledge, and compassion in providing high-quality healthcare to patients. Students are expected to develop a strong foundation in patient-centered care, practice-based learning, and a commitment to continuous improvement in their clinical practice.

- **Practice-Based Learning:** Students should engage in continuous learning through practical experience, applying evidence-based medicine and reflecting on their clinical practice to improve patient care.
 - o Apply evidence-based medicine in clinical practice.
 - Reflect on clinical experiences to improve patient care.
 - o Engage in self-directed learning to enhance clinical skills.
- **Service Orientation:** A commitment to serving others is fundamental to the practice of medicine. Students should prioritize the well-being of patients and the community, demonstrating a strong dedication to providing compassionate and effective care.
 - o Demonstrate a commitment to patient-centered care.
 - Engage in community service activities.
 - o Reflect on the role of service in medical practice.

Competency 2: Ethical & Professional

The "Ethical & Professional" competency encompasses the foundational principles of medical ethics and professional behavior. It requires students to uphold the highest standards of legal and ethical responsibility in their practice. They must demonstrate empathy, integrity, and accountability, treating all individuals with respect and maintaining a commitment to continuous improvement.

- **Professional & Ethical & Legal Responsibility:** Students are expected to understand and apply ethical principles and legal requirements in medical practice. They should be able to identify and analyze ethical dilemmas in healthcare settings and make decisions that prioritize patient well-being.
 - Explain ethical frameworks in medical decision-making.
 - Apply legal standards in patient care.
 - o Demonstrate professionalism in all interactions.
- Capacity for Improvement: Students should continuously strive to improve their clinical skills, knowledge, and patient care practices through self-assessment and reflective learning.
 - o Assess personal strengths and weaknesses.
 - Implement strategies for self-improvement.
 - Seek feedback from peers and mentors.
- **Empathy:** Understanding and sharing the feelings of patients is crucial for building trust and providing compassionate care. Students must develop the ability to empathize with patients from diverse backgrounds.
 - o Demonstrate empathy in patient interactions.
 - Reflect on the emotional and psychological aspects of patient care.
 - Integrate empathy into clinical practice.
- Integrity: Students must practice medicine with honesty and adhere to moral and ethical principles, ensuring that their actions align with the values of the medical profession.
 - Maintain honesty in patient interactions.
 - Uphold ethical standards in clinical decision-making.
 - o Demonstrate transparency in communication with patients and colleagues.
- Accountability: Medical students must be accountable for their actions, taking responsibility for their decisions and outcomes in patient care.

- o Take responsibility for clinical decisions.
- o Reflect on the outcomes of patient care.
- Ensure accountability in teamwork.
- **Respect:** Respect for patients, colleagues, and the broader healthcare team is fundamental. Students should treat everyone with dignity and consideration, regardless of differences in background or beliefs.
 - o Demonstrate respect in patient interactions.
 - o Collaborate respectfully with team members.
 - o Address cultural differences in a respectful manner.

Competency 3: Scholar & Life-Long Learner

The "Scholar & Life-Long Learner" competency highlights the importance of continuous learning and scholarly inquiry in medical practice. Students are encouraged to engage in scientific research, develop critical thinking skills, and commit to lifelong learning to stay current in their field and contribute to the advancement of medical knowledge.

- Living Systems: Students should have a deep understanding of living systems and their functions, enabling them to apply this knowledge to patient care.
 - o Explain the principles of living systems.
 - o Apply knowledge of living systems to clinical practice.
 - o Evaluate the impact of living systems on health and disease.
- **Human Behavior:** Understanding human behavior is crucial for effective patient care and communication. Students should be able to analyze behavioral factors that influence health and apply this understanding in clinical settings.
 - o Analyze the impact of behavior on health outcomes.
 - Apply behavioral principles in patient care.
 - o Reflect on the role of behavior in health and disease.
- **Diagnose and Manage:** Students must be proficient in diagnosing and managing medical conditions, using evidence-based approaches to ensure the best possible outcomes for patients.
 - Diagnose medical conditions accurately.

- o Develop management plans for patient care.
- Evaluate the effectiveness of treatment interventions.
- Scientific Inquiry: Engaging in scientific inquiry is essential for advancing medical knowledge. Students should be able to conduct research, critically appraise evidence, and contribute to the scientific community.
 - o Conduct research on medical topics.
 - o Critically appraise scientific literature.
 - Disseminate research findings effectively.
- Quantitative Reasoning: Quantitative reasoning skills are necessary for interpreting data and making informed decisions in medical practice. Students should be able to analyze and apply quantitative data in clinical settings.
 - o Interpret quantitative data in clinical practice.
 - Apply statistical methods to medical research.
 - Reflect on the role of quantitative reasoning in decision-making.
- Critical Thinker: Developing critical thinking skills is vital for solving complex medical problems. Students should be able to analyze information, evaluate evidence, and make reasoned decisions in patient care.
 - o Analyze clinical scenarios critically.
 - o Evaluate evidence in medical practice.
 - Make informed decisions based on critical thinking.

Competency 4: Team Worker & Communicator

The "Team Worker & Communicator" competency emphasizes the importance of effective communication and teamwork in healthcare settings. Students are expected to develop strong oral and written communication skills, work collaboratively as part of a healthcare team, and demonstrate leadership when necessary. Reliability, adaptability, and resilience are key qualities that support their ability to function effectively in diverse and dynamic clinical environments.

• Oral and Written Communication: Students must be able to convey medical information clearly and effectively, both verbally and in writing, to patients, families, and colleagues.

- o Communicate medical information clearly.
- o Develop patient-centered communication strategies.
- Write accurate and comprehensive patient records.
- Team Member: Students should actively participate as members of the healthcare team, contributing to collective problem-solving and decision-making processes.
 - o Collaborate effectively with team members.
 - o Participate in interdisciplinary case discussions.
 - Contribute to team-based patient care.
- **Team Leader:** When required, students should be able to take on leadership roles within the healthcare team, guiding and coordinating the efforts of others.
 - o Lead a healthcare team in clinical settings.
 - Make decisions as a team leader.
 - Facilitate effective team communication.
- Reliability and Dependability: Students must consistently demonstrate reliability and dependability in fulfilling their clinical responsibilities, ensuring that they are trusted members of the healthcare team.
 - Fulfill clinical duties reliably.
 - o Demonstrate dependability in patient care.
 - Maintain consistency in performance under pressure.
- Resilience & Adaptability: Students need to develop resilience to cope with the challenges of medical practice and adapt to changes in clinical settings.
 - Demonstrate resilience in stressful situations.
 - Adapt to changes in clinical practice.
 - Reflect on challenges and adapt strategies accordingly.

Competency 5: Community Health Promoter

The "Community Health Promoter" competency focuses on the role of medical students in promoting health within the community. It involves educating and empowering communities, conducting assessments, and engaging with diverse populations to address public health challenges. Cultural competence and advocacy are essential in promoting health equity and improving community health outcomes.

- **Health Education and Promotion:** Students should be able to design and implement health education programs that address the specific needs of the community.
 - Develop health education materials.
 - o Implement community health promotion activities.
 - Evaluate the effectiveness of health education programs.
- Community Assessment and Engagement: Students must be capable of assessing the health needs of communities and engaging with community members to identify and address public health issues.
 - o Conduct community health assessments.
 - Engage with community stakeholders.
 - o Identify public health priorities based on community needs.
- Cultural Competence: Understanding and respecting cultural differences is crucial in providing effective community health promotion. Students should be able to work with diverse populations and tailor health interventions accordingly.
 - Demonstrate cultural sensitivity in community interactions.
 - o Adapt health interventions to cultural contexts.
 - o Reflect on cultural influences in health behaviors.
- Advocacy and Empowerment: Students should advocate for policies and practices that promote community health and empower individuals and communities to take control of their health.
 - o Advocate for community health initiatives.
 - Empower individuals to make informed health decisions.
 - o Promote policies that address social determinants of health.

Competency 6: Quality & Safety Practitioner

The "Quality & Safety Practitioner" competency emphasizes the importance of patient safety and quality improvement in healthcare. Students are trained to understand and apply patient safety principles, comply with regulatory requirements, and collaborate with interdisciplinary teams to ensure the highest standards of care.

- Patient Safety Principles: Students must understand and apply patient safety principles to prevent medical errors and enhance the quality of care.
 - o Identify potential safety risks in clinical practice.
 - o Implement strategies to prevent medical errors.
 - Evaluate the effectiveness of patient safety interventions.
- **Regulatory Compliance:** Knowledge of and adherence to regulatory standards is essential in maintaining patient safety and quality care. Students must be familiar with relevant regulations and ensure compliance in their practice.
 - o Understand and apply healthcare regulations.
 - o Ensure compliance with legal and regulatory standards.
 - o Reflect on the impact of regulations on patient safety.
- **Interdisciplinary Collaboration:** Effective collaboration with professionals from various disciplines is necessary to achieve optimal patient outcomes. Students should develop skills in working within interdisciplinary teams to enhance patient care.
 - o Collaborate with interdisciplinary teams in patient care.
 - o Contribute to interdisciplinary case discussions.
 - o Reflect on the impact of interdisciplinary collaboration on patient outcomes.

Competency 7: Digital & Artificial Intelligence Literate

The "Digital & Artificial Intelligence Literate" competency prepares students to navigate the rapidly evolving landscape of digital health and artificial intelligence. Students are trained to use AI-based systems ethically and effectively in diagnosis and decision-making, ensuring that technological advancements are integrated into patient care responsibly.

- Technology and AI-Based Diagnosis and Decision-Based Systems: Students should be proficient in using technology and AI tools for diagnosis and decision-making, ensuring that these tools enhance patient care.
 - o Use AI-based tools for diagnosis.

- o Evaluate the effectiveness of technology in clinical decision-making.
- o Integrate digital tools into patient care responsibly.
- Ethical Usage of AI: Ethical considerations are paramount when using AI in healthcare. Students must understand the ethical implications of AI and ensure that its application respects patient rights and autonomy.
 - o Identify ethical issues in AI usage.
 - o Apply ethical principles to AI-based decisions.
 - o Reflect on the impact of AI on patient care.

This framework ensures that undergraduate medical students at Rawalpindi Medical University are well-prepared to excel as competent, ethical, and compassionate healthcare professionals. By meeting these competencies and their corresponding learning objectives, students will be equipped to navigate the complexities of modern medical practice and contribute meaningfully to patient care and community health.

Outcomes of the Curriculum

Outcomes in medical education are the specific knowledge, skills, and attitudes that learners are expected to demonstrate by the end of their educational program. These outcomes are typically framed in terms of the goals of the curriculum, which align with the needs of the healthcare system and patient care. Educational outcomes serve as benchmarks for assessment and evaluation of student progress and help ensure that training programs produce competent healthcare professionals.

Outcomes 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.

SECTION-IV

Five Year Structured
Framework of Clinically
Oriented Integrated Modular
Curriculum 2024

Sr. No	Class	Module	Block		
		Foundation Module	6 weeks	Block-I	
		MSK-I Module	5 weeks		
		MSK-II Module	5 weeks	Block -II	
1.	First Year MBBS	Blood & immunity Module	5 weeks		
		CVS Module	6 weeks		
		Respiration Module	5 weeks	Block -III	
		General Education Cluster Module	1 week		
		Gastrointestinal tract Module	5 weeks	Block-IV	
		Renal module	5 weeks		
•	Second Year MBBS	Reproduction Module	4 weeks	Block -V	
2.	Second Year MBBS	Central nervous system module	6 weeks		
		Special Senses Module	4 weeks	Block -VI	
		Endocrinology Module	5 weeks		
		Foundation 1	4 weeks	Block- VII	
		Foundation II	4 weeks		
3.	Third Year MBBS	GIT, Hepatobiliary & Parasitology	5 weeks	Block - VIII	
3.	Tillru Tear MIDDS	Microbes & Antimicrobials	7 weeks	Block - IX	
		Hematology, Immunology & Research	5 weeks		
		CVS & Respiration	5 weeks		
		Otorhinolaryngology 1	2.5 weeks	Block- X	
		Otorhinolaryngology II	3 weeks		
		Ophthalmology I	2.5 weeks	Block - XI	
4.	Fourth Year MBBS	Ophthalmology II	3 weeks		
4.	rourui Tear Midds	Endocrinology	5 weeks	Block -XII	
		Population Health & Reproduction	6 weeks		
		Renal	4 weeks	Block – XIII	
		CNS & Psychiatry	6 weeks		
		Medicine & Allied	12 weeks	Block- XIV	
5.	Final Year MBBS	Surgery & Allied	12 weeks	Block- XV	
		Gynae & Peads	12 weeks	Block- XVI	

About the Structured Framework

The five-year structured framework for the MBBS program at Rawalpindi Medical University follows a highly integrated approach in both horizontal and vertical alignment of subjects. In the first year, core subjects like Anatomy, Physiology, and Biochemistry are taught alongside foundational modules. The year is divided into blocks covering musculoskeletal systems (MSK I & II), blood and immunity, cardiovascular systems (CVS), and respiratory systems. These blocks are also spirally integrated with general education cluster courses such as Ethics and Artificial Intelligence, as well as early clinical exposure to provide a balanced mix of theory and clinical practice. In each block, core subjects are vertically integrated with preclinical subjects like Community Medicine, Pathology, and Pharmacology and clinical subjects like medicine, surgery, gynecology and pediatrics.

In the second year, students delve deeper into systems such as the gastrointestinal tract (GIT), renal system, reproductive system, and central nervous system (CNS). Vertical integration becomes more pronounced, with clinical exposure integrated into practical aspects of these modules. Horizontal integration continues with courses like Behavioral Sciences and Bioethics, and students continue to take spirally integrated courses like Family Medicine and Digital Literacy. The curriculum maintains continuity by revisiting previously covered topics through spiral integration, reinforcing concepts across the academic years.

In the third year, the MBBS curriculum at Rawalpindi Medical University introduces students to more advanced clinical and biomedical concepts. Key systems covered include the gastrointestinal (GIT) and hepatobiliary systems, parasitology, microbiology, and hematology. Horizontally, students continue to engage with clinical subjects like pathology, pharmacology, and community medicine. The curriculum remains horizontally integrated, combining clinical rotations with system-based learning ensuring that theoretical knowledge is continuously reinforced with practical clinical exposure. Spirally integrated subjects like research methodology and bioethics further complement the learning process by revisiting concepts from earlier years.

In the fourth year, the curriculum intensifies with modules in otorhinolaryngology (ENT), ophthalmology, endocrinology, population health, renal medicine, and psychiatry. Horizontal integration ensures that core clinical concepts are covered alongside biomedical sciences, while vertical integration deepens students' practical knowledge as they spend more time in clinical settings. Modules on population health and reproductive health introduce broader public health perspectives. Spirally integrated courses continue to reinforce learning outcomes, addressing essential soft skills, leadership, and ethics.

The final year focuses almost entirely on clinical clerkships in medicine and allied specialties, surgery and allied fields, gynecology, and pediatrics, representing the culmination of the horizontal and vertical integration model. Students apply their knowledge and skills comprehensively in real-world clinical environments. They work directly with patients under supervision, allowing them to gain hands-on experience. Spirally integrated subjects continue to emphasize ethical decision-making, professionalism, and patient safety. This year ensures that students are fully prepared for their future roles as competent, ethical, and compassionate healthcare providers.



Structured Framework of First Year MBBS Curriculum

Blocks					Block-	I						В	lock II					Block	i III		ter			of Send U al Exami	
	le	nt			MSK-I	(04 V	Veeks)				1	ıts		Blood mity N	& Aodule		nt	le	ıt .	t	Clus	dn		ıtion	ntion
Module	Foundation Module	Module Assessment	MSK-I	Spring Vacation	I-XSM	Student Week	MSK-I	Module Assessment	Block Assessment	MSK - II	Summer Vacation	Module Assessments	Blood & Immunity Module	Module Assessment	Block Assessment	CVS	Module Assessment	Respiratory Module	Module Assessment	Block Assessment	General Education Cluster (GEC) Module	Prep leaves for send up	Send up	Prep Leaves for Professional Examination	Professional Examination
Duration in Weeks / Days	06 Weeks	03 Days	First Week	08 Days	First & Second Week	06 Days	Third- & Fourth Weeks	06 Days	03 Days	04 Weeks	2024	06 Days	04 Weeks	06 Days	03 Days	05 Weeks	06 Days	04 Weeks	06 Days	03 Days	06 Day	10 Days	13 Days	15 Days	20 Days
Dates	12th -Feb - 22nd March 2024	25th March – 27th March, 2024	1st April – 24th April 2024	05th April – 13th April 2024	25 th April – 27 th April 2024	29th April – 04th May 2024	05th May – 15th May 2024	16 th Мау – 22 nd Мау 2024	23 rd May – 25 th May 2024	27th May - 27th July 2024	17th June — 20th July 2	29th July – 03rd August 2024	05th August – 31st August 2024	02nd Sep - 07th Sep 2024	09th Sep - 11th Sep 2024	12th Sep – 10th Oct 2024	12th Oct – 18th Oct 2024	21st Oct – 16th Nov 2024	18th Oct – 23rd Nov 2024	25th Nov – 27th Nov 2024	28th Nov – 04 Dec 2024	05th Dec – 14th Dec 2024	15th Dec – 27th Dec 2024	28th Dec 2024 – 11th Jan 2025	12th Jan 2024 –31st Jan 2025

^{*}Note: All dates are subject to change.

Implementation TORs

In the first year MBBS teaching framework at Rawalpindi Medical University, the academic year is divided into three primary blocks, covering a total of 36 weeks of teaching. Each block focuses on core modules integrating basic sciences with early clinical exposure. The academic calendar begins with a 6-week Foundation Module, followed by two blocks focusing on the musculoskeletal system (MSK-I and MSK-II), blood and immunity, cardiovascular system (CVS), and respiratory system modules. In addition to core subjects such as Anatomy, Physiology, and Biochemistry, the first year includes spirally integrated general education courses such as Artificial Intelligence, Family Medicine, and Biomedical Ethics.

In terms of time allocation, 39% of the teaching hours are dedicated to Block I, which includes the Foundation Module and the MSK-I Module. The remaining hours are distributed across Block II (MSK-II and Blood/Immunity modules) with 27%, and Block III (CVS and Respiratory modules) accounting for 34% of the teaching time. Anatomy, Physiology, and

Biochemistry are the core subjects taught across all blocks. In total, 38% of the total teaching hours are dedicated to Anatomy, 39% to Physiology, and 23% to Biochemistry. These subjects are horizontally integrated, ensuring that students learn them in conjunction with their clinical applications.

The clinical teaching hours are integrated into the curriculum from the first year, with 103 hours dedicated to disciplines such as Community Medicine, Pathology, Pharmacology, and Radiology, among others. Clinical subjects are vertically integrated into the system-based modules to provide context and relevance to theoretical concepts. Additionally, spirally integrated subjects like Behavioral Sciences and Family Medicine, introduced in the first year, ensure continuity and reinforce learning through subsequent years.

This framework ensures that first-year MBBS students at RMU not only gain a solid foundation in basic medical sciences but also begin to develop essential clinical skills early on.

The integrated modular approach, combined with a balance of horizontal, vertical and spiral integration, allows for a cohesive and practical learning experience.

Contact Hour Distribution for Core Subjects First Year MBBS

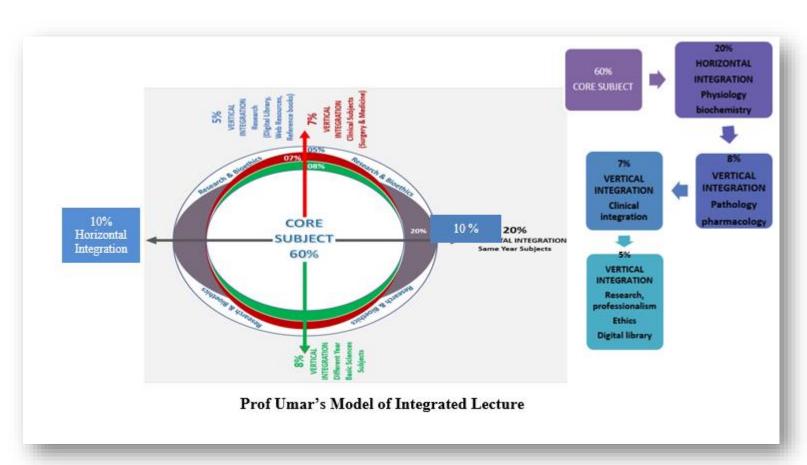
			Teaching Hours 1	st Year MBBS			
Blocks	Modules	Anatomy	Physiology	Biochemistry	Total	Total Hours	Percentage
D1 1 1	Foundation	86	111	56	253	469	39
Block-I	MSK-I	89	97	30	216	403	39
D1 1 11	MSK-II	132	86	44	262	332	27
Block-II	Blood & Immunity	8	32	30	70	332	21
D1 1 III	CVS	70	98	84	252	409	34
Block-III	Respiration	76	50	31	157	407	34
Total Hours Per Subject		461	474	275	1210		
Percentage		38	39	23	100		100

Discipline Wise Clinical & Spiral Teaching Hours

Sr. No	Discipline	Contact Hours
1.	Behavioral sciences	05
2.	Community Medicine	09
3.	Pathology	13
4.	Pharmacology	08
5.	Medicine	13
6.	ENT	01
7.	DME	10
8.	Radiology	03
9.	Artificial Intelligence	01
10.	Family Medicine	03
11.	Gynae & Obs	01
12.	Quran translation	13
13.	Surgery	03
14.	Biomedical Ethics	05
15.	IUGRC	15
	Total Hours	103 Hours



Teaching Strategies



Introduction

The teaching strategies employed in the MBBS curriculum at Rawalpindi Medical University emphasize interactive and student-centered learning methods. A variety of instructional approaches are integrated into the program, ensuring that students not only grasp theoretical knowledge but also apply it in practical, real-world scenarios. The Large Group Interactive Sessions (LGIS) serve as the backbone of this approach, where the professor introduces critical medical topics using multimedia tools like patient videos, interviews, and clinical exercises. This format encourages active participation, allowing students to engage directly with complex concepts and clinical conditions.

In addition to LGIS, Small Group Discussions (SGD) play a crucial role in deepening students' understanding. These sessions involve structured exercises, such as patient case discussions or topic presentations, designed to promote peer-to-peer learning and critical thinking. The facilitator's role is to guide discussions, ask probing questions, and ensure that students apply their knowledge to real-world medical challenges. The small group format helps students clarify core concepts, acquire new skills, and develop the professional attitudes necessary for clinical practice.

The curriculum also incorporates Self-Directed Learning (SDL) and Problem-Based Learning (PBL), both of which foster autonomy and critical inquiry. In SDL, students take charge of their own learning by exploring predefined objectives and resources. This independent study approach empowers them to develop skills in managing their time and resources effectively. PBL, on the other hand, places students in group settings where they collaboratively solve open-ended clinical problems. This method emphasizes analytical thinking, communication, and collaboration, all key components in medical education and practice.

Finally, practical learning is reinforced through Skill Labs and Clinical Practicals, where students perform hands-on exercises to develop procedural skills. This experiential learning is essential for bridging the gap between theory and practice, ensuring that students gain the confidence and technical ability needed for clinical rotations. These strategies collectively create a well-rounded and engaging educational environment that prepares students to become competent, empathetic physicians .

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.

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

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%

Steps of Implementation 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, horizontal integration, vertical integration, related research article, related ethics content	
Step 9	Students Assessment on online MS teams (5 MCQs)	5 min
Step 10	Summarization of main points by the facilitator	5 min
Step 11	Students feedback on the SGD and entry into log book	5 min
Step 12	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

PBL (SDL)

 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.

The 7- Jum	p-Format of PBL (Maastricht Medical School)
Step 7	Synthesize & Report
Step 6	Collect Information from outside
Step 5	Generate learning Issues
Step 4	Discuss and Organize 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

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.

Practical Sessions/Skill Lab (SKL)

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



Course Contents

Block-I

Module No. 1- Foundation

Duration 6 Weeks



Foundation Module Team

Module Name : Foundation Module

Duration of module : 06 Weeks

14. Focal Person Community Medicine

15. Focal Person Quran Translation

16. Focal Person Family Medicine

Lectures

Coordinator:Dr. Zenera SaqibCo-coordinator:Dr. Qurat Ul AinReviewed by:Module Committee

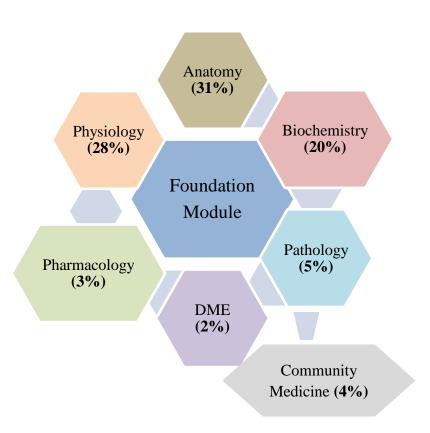
Dr. Afifa Kulsoom

Dr. Uzma Zafar

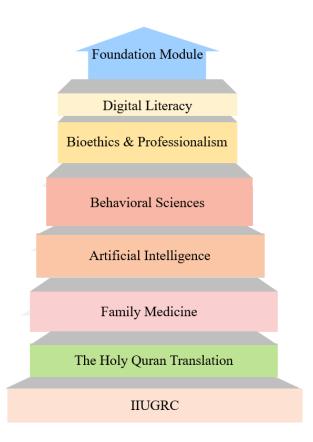
Dr. Sadia Khan

	Module Comm	ittee		Module Task Force Team						
1.	Vice Chancellor RMU	Prof. Dr. Muhammad Umar	1.	Coordinator	Dr. Zenera Saqib (Demonstrator of Anatomy)					
2.	Director DME	Prof. Dr. Rai Muhammad Asghar	2.	DME Focal Person	Dr. Sidra Hamid					
3.	Convener Curriculum	Prof. Dr. Naeem Akhter	3.	Co-coordinator	Dr. Qurat Ul Ain (Senior Demonstrator of Anatomy)					
4.	Chairperson Anatomy & Dean Basic Sciences	Prof. Dr. Ayesha Yousaf	4.	Co-Coordinator	Dr. Uzma Kiyani (Senior Demonstrator of Physiology)					
5.	Additional Director DME	Prof. Dr. Ifra Saeed	5.	Co-coordinator	Dr. Nayab Ramzan (Senior Demonstrator of Biochemistry)					
6.	Chairperson Physiology	Prof. Dr. Samia Sarwar								
7.	Chairperson Biochemistry	Dr. Aneela Jamil		DME I	mplementation Team					
			1.	Director DME	Prof. Dr. Rai Muhammad Asghar					
8.	Focal Person Anatomy First Year	Asso. Prof. Dr. Mohtashim	2.	Implementation Incharge 1st & 2 nd	Prof. Dr. Ifra Saeed					
	MBBS	Hina		Year MBBS & Add. Director DME						
9.	Focal Person Physiology	Dr. Sidra Hamid	3.	Assistant Director DME	Dr. Sidra Hamid					
10.	Focal Person Biochemistry	Dr. Aneela Jamil	4.	Editor	Muhammad Arslan Aslam					
11.	Focal Person Pharmacology	Dr. Zunera Hakim								
12.	Focal Person Pathology	Dr. Asiya Niazi								
13.	Focal Person Behavioral Sciences	Dr. Saadia Yasir								

Integration



Disciplines in Foundation Module



Spiral / General Education Cluster Courses (5%)

			Integration		
			Themes		
Block	Module	General Anatomy	Embryology	Histology	Gross Anatomy
I	• Anatomy	Introduction to General Anatomy	General Embryology Introduction to Human Development Oogenesis Spermatogenesis Female Reproductive Cycles Ovulation and Fertilization Cleavage and Blastocyst Formation Development of Mammary Gland	General Histology Types of Epithelium Specialization of Apical Cell Surface Intercellular Junctions and Adhesions Glandular Epithelium Mammary Gland	 Anatomicomedical Terminologies I (position & planes) Anatomicomedical Terminologies II (Anatomical Terms and Axis of Movements) Anatomicomedical Terminologies III (Cell and Tissues) Anatomicomedical Terminologies IV (Skin & Body Systems) Clavicle Scapula Humerus Anterior Axioappendicular Muscles Posterior Axioappendicular Muscles Axilla Brachial Plexus Brachial Plexus Injuries Breast Sternoclavicular and Acromiclavicular Joints Radiograph and Surface Anatomy of Axioappendicular
	Biochemistry		anelles, Cell Membrane and Tran	•	Region e, Physicochemical Properties,
-			, Nucleic Acid Chemistry, Genetization of The Human Body and		ronment
	 Physiology 	 The Cell and Its F 		Condoi of the Internal Envi	HOIIIIGH
	,		f Protein Synthesis, Cell Functio	n, And Cell Reproduction	
		• Transport of Subs	tances Through the Cell Membra	nne	

Orientation Sessions

- Opening Ceremony (DME)
- Introduction to Digital Services Of RMU
- Introduction to Integrated Modular Curriculum, Study Guide sand RMU Policies
- Assessment Model of RMU & Continuous Internal Assessment
- Research Model of RMU (IUGRC), Biomedical Ethics Family Medicine, Artificial Intelligence
- Introduction to Different Teaching Strategies, Role of Team Leader Facilitator and Students SGD/LGIS/TBL/PAL/INTERNET & Literature Group activity (DME)
- Orientation to Integrated Modular System for Pre-clinical Years (DME)
- Lecture on Feedback (DME)
- Mission and Vision (DME)
- Introduction to Pharmacology
- Introduction to Pathology
- Introduction to Community Medicine (Community Medicine)
- Introduction to Medicine (Medicine)

- introduction to wiedr	eme (wedieme)
	Spiral Courses
The Holy Quran	The Holy Quran Translation Component
Translation	Islam And Medical Science
	Introduction to Quran Translation
• Bioethics &	Introduction to history of medical ethics
Professionalism	Leadership Professionalism (DME)
 Artificial 	Introduction to Artificial Intelligence
Intelligence	
Family Medicine	Introduction to Family Medicine & its application in health care system
 Integrated Under 	Research I Introduction of health research process
Graduate Research	Research II characteristic of research process
Innovation	Research III Basis of ethics in health research
(IUGRC)	Research IV Basics of ethics in medical research
 Behavioral 	Introduction to Behavioral Sciences
Sciences	Management of stress
Digital Literacy	How to use Higher Education Commission (HEC) digital library.
Module	
 Life Style and 	Healthy Lifestyle: A Foundation for Medical Professionals
Prevention	
	Vertical Integration
Clinically content rel	levant to Foundation module

Routs of drug administration (Pharmacology)					
Absorption of drugs (Pharmacology)					
 Factors affecting drug absorption (Pharmacology) 					
Distribution of drugs (Pharmacology)					
Cellular response to injury (Pathology)					
Intracellular accumulations (Pathology)					
Pigments (Pathology)					
• Free radical and reactive oxygen species (Pathology)					
 Irreversible cell injury/apoptosis (Pathology) 					
Genetic disorders (Pathology)					
History of medicine (Medicine)					
Medicine and allied subjects (Medicine)					
Chromosomal abressions (Medicine)					
History taking and general physical examination (Medicine)					
Early Clinical Exposure (ECE)					
Clinical Rotation of students to					
Rotations • Medicine & Allied					
Surgery and Trauma					
Emergency Department					
Hands on Workshop on Basic Life Support (BLS)					
Hands on Workshops on BLS					
Clinical Relevance					
Medical Ethics					
Genetic Disorders					
 Understanding cellular and molecular mechanisms in disease (e.g., cancer and diabetes) 					
• Importance of homeostasis in maintaining normal physiological function (e.g., dehydration and acid-base imbalances)					
 Application of medical ethics in real-life scenarios, such as patient confidentiality 					
Effective doctor-patient communication in history-taking and empathy					

Implementation of Terms of Reference (TORS)

- Total hours of teaching, learning and formative/summative internal assessment to be completed in a year are predefined as per the guidelines of PMDC and to be strictly followed.
- The hours mentioned within each module are the mandatory minimum required.
- The content and the intended learning outcomes written are mandatory, to be taught, at the level required, as the end year assessment will be based on these. However, the level of cognition can be kept at a higher level.
- The Table of Specifications provided will be used for the three papers of the first professional examination.
- The same table of specifications should be used for the respective block exams for internal assessment.
- The criteria defined for continuous internal assessment is to be followed for each module and block respectively

Module No. 1 - Foundation

Introduction: In the Foundation Module students will develop understanding of the basic concepts of cell Physiology, Biochemistry, Anatomy, Pathology, Pharmacology, Community medicine and study skills through an integrated course.

Rationale: The foundation module is designed to impart basic knowledge about the normal structure, organization, functions and development of human body. This knowledge will serve as a base on which the student will construct further knowledge about the etiology, pathogenesis and prevention of diseases; the principles of their therapeutics and management.

Module Outcomes

Each student will be able to:

Knowledge

- Acquire the basic science knowledge and terminology necessary to understand the development and functioning of normal structures of human body starting from biochemical level to organ system level, as well as the concepts of diseases in the community and drug dynamics.
 Use technology based medical education including
- Artificial Intelligence.
 Appreciate concepts & importance of:
- Family Medicine
- Biomedical Ethics
- Research.
- Entrepreneurship

Skills

- Identify different anatomical planes and correlate the importance of these with clinical medicine.
- Identify various apparatus used in lab.
- Preparation and identification of microscopic slides.
- Preparation of solutions of various strengths.
- Basic Life Support (BLS)
- Early Clinical Exposure (ECE)

Attitude

• Demonstrate professional attitude, team-building spirit and good communication skills.

This module will run in 6 weeks' duration. The content will be covered through introduction of topics. 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!

Orientation Week- Introduction to RMU and Disciplines

Medical Education and Integrated Disciplines						
Topic	Facilitator	Learning Objectives	Teaching Strategy	Assessmen t Tool		
Introduction to RMU and Allied Hospitals	Vice Chancellor	Honorable VC will welcome and introduce the University and Allied Hospitals.	LGIS	MCQS		
	Tì	ne students will be able to:	1	<u> </u>		
Introduction to Medical Education Department Introduction to Integrated Modular System and Foundation Module	Assistant Director DME	 Introduce DME Define Medical Education Discuss its role Describe CME Appreciate role of DME in their curriculum Appreciate role of DME in attendance monitoring Illustrate the application Leave submission process Outline the RMU Curriculum structural organization, (integrated modular system) Describe Learning resources used in study guides 	LGIS	MCQS		
Introduction to Basic Sciences Introduction to	Lecture by HODs Lecture by Dean	 Define Anatomy Define Physiology Define Biochemistry Define Pathology Define Community Medicine Define Forensic Medicine Define Pharmacology Define medicine Discuss History of medicine 	LGIS	MCQS		
Medicine & Allied	of Medicine & Allied	 Describe Islamic concepts of medicine Identify Basic sciences involved in medicine Identify Clinical subjects and their role 	LGIS	MCQS		

		Describe practice of medicine		
Introduction to Teaching And Learning Strategies With Emphasis On SGD/LGIS/TBL (Team base learning)/PAL (Peer Assisted learning)/Internet & Literature Search	Basic Science Team & DME	 Differentiate between various Teaching & Learning strategies Describe the process Enlist different roles of students and facilitator in mentioned teaching sessions 	LGIS	MCQS
Introduction To Use Of Laboratory Facilities / Equipment And Safety Measures (Biochemistry and Pathology)	Team members (Biochemistry and Pathology)	 Recall precautionary measures mandatory during practical sessions and skill lab Recall safety measures during blood handling Demonstrate use of various glass ware Demonstrate use of lab instruments 	LGIS	MCQS
Study Skills-I (Medical Educationist and Behavioral Sciences)	Behavior Science and DME team member	 Define study skills or study strategies (how to study?) Describe the: Methods based on memorization such as rehearsal and rote learning Methods to retain the content in long term memory Methods based on communication skills e.g., reading and listening Principles of TBL & PAL 	LGIS	OSPE
Study Skills-II	Behavior Science and DME team member	 Describe the: Methods based on condensing information, summarizing and the use of keywords Methods based on visual imagery Methods based on acronyms and pneumonics Methods based on time management, organization and lifestyle changes 	LGIS	MCQS
Islam and Medical Science	Mufti Naeem sab	Discuss role of Islam and importance of Islam in Medical Science	LGIS	MCQS



Syllabus of Foundation (Module No. 1)

		Anatomy			
		Theory			
Code	Topic	Learning Objectives At The End Of One Hour The Lecture The Student Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
		Define the term Anatomy and its various branches	C1		
		Define different terminologies related to Anatomy	C1	_	SAQ MCQ VIVA
	Introduction to	Describe different Anatomical planes and directions in relation to anatomical position	C2	LGIS	
General		Elaborate different phases in life span of man	C2		
		Define basic tissues of human body	C1		
		Discuss general outlines and functions of basic tissues	C2		
		Describe formation of different systems of body	C2		
		Understand the curative and preventive health care measures.	C3	-	
		Practice the principles of bioethics	C3	-	
		Apply the strategic use of artificial intelligence in healthcare	C3		ı
		Read relevant research article	C3	-	
		Use HEC digital library	C3		
		Embryology			
	Introduction to	Discuss significance and importance of studying Embryology.	C2		
M1-FM-A-002	Human Development	Define different terminologies to describe developmental stages.	C1		

		Describe series of critical events that take place during embryonic development.	C2		SAQ
		Appreciate difference between embryonic and fetal period.	C2	LGIS	MCQ VIVA
		Discuss common chromosomal abnormalities.	C2		VIVA
		Understand the curative and preventive health care measures.	C3		
		Apply the strategic use of artificial intelligence in healthcare.	C3		
		Practice principles of bioethics	C3		
		Use HEC digital library.	C3		
		Read relevant research article.	C3		
		Discuss role of female hormones during oogenesis	C2		
	Oogenesis	Describe different stages of oogenesis	C2	LGIS	SAQ MCQ
		Correlate clinical aspects of gametogenesis	C3		
M1-FM-A-003		To understand the bio-physiological aspects of gametogenesis	C2		
		Understand the curative and preventive health care measures.	C3		VIVA
		Apply the strategic use of artificial intelligence in healthcare	C3		
		Practice the principles of bioethics	C3		
		Use HEC digital library	C3		
		Read a relevant research article	C3		
M1-FM-A-004	Spermatogenesis	Define spermatogenesis.	C1		
		Describe different phases of spermatogenesis	C2		
		Discuss stages of spermiogenesis	C2		

		Elaborate functions of male hormones during spermatogenesis	C2	LGIS	SAQ MCQ
		Understand the curative and preventive health care measures.	C3		VIVA
		Practice the principles of bioethics	C3		
		Apply the strategic use of artificial intelligence in healthcare	C3		
		Able to read a relevant research article	C3		
		Use HEC digital library	C3		
		Understand Ovarian and Uterine cycle	C1		
		Correlate Ovarian and Uterine cycles	C3	LGIS	
	Female Reproductive Cycles	Describe different phases of Ovarian and Uterine cycles	C2		SAQ MCQ
		Enumerate female sex hormones	C1		
M1-FM-A-005		Discuss functional significance of female reproductive hormones in reproductive cycles	C2		VIVA
		Discuss the anovulatory cycle in female	C3		
		Understand the bio-physiological aspects female reproductive cycle	C2		
		Focus on provision of curative and preventive health care services	C3		
		Read a relevant research article	C3		
		Apply the strategic use of artificial intelligence in healthcare	C3		
		Use HEC digital library	C3		
M1-FM-A-006	Ovulation and Fertilization	Describe follicular development, ovulation and subsequent events in ovary	C2		
		Give an account on role of luteinizing hormone in ovulation	C1		SAQ

		Discuss capacitation in female genital tract	C2	LGIS	MCQ
		Describe different phases and results of fertilization	C2		VIVA
		Enlist causes of infertility.	C1		
		Enlist different technologies of assisted fertilization	C1		
		Discuss different techniques of assisted reproduction with special emphasis on IVF	C3		
		Discuss the bio-physiological aspects of ovulation and fertilization	C2		
		Focus on provision of curative and preventive health care services.	C3		
		Practice principles of bioethics	C3		
		Apply the strategic use of artificial intelligence in healthcare	С3		
		Understand the curative and preventive health care measures.	C3		
		Read a relevant research article	C3		
		Use HEC digital library	C3		
		Define cleavage	C1		
		Define compaction	C1		
	Cleavage and Formation of Blastocyst	Describe blastocyst formation	C2		SAQ
M1-FM-A-007		Understand the bio-physiological aspects of cleavage and blastocyst	C2	LGIS	MCQ VIVA
		Correlate clinical condition of cleavage and blastocyst formation	C3		4141
		Apply the strategic use of artificial intelligence in healthcare	C3		
		Understand the curative and preventive health care measures.	С3		

		Practice principles of bioethics	C3		
		Read a relevant research article	C3		
		Use HEC digital library	C3		
		Describe the Sources of development of mammary gland .	C2		
		Discuss different stages of activity of mammary gland.	C2	LGIS	SAQ MCQ VIVA
M1-FM-A-008	Development Of	Understand the bio-physiological aspects of mammary gland.	C2	Lois	
	Mammary Gland	Correlate clinical conditions of mammary gland	C3		
		Apply the strategic use of artificial intelligence in healthcare	C3		
		Practice principles of bioethics.	C3		
		Understand the curative and preventive health care measures.	C3		
		Read a relevant research article;	C3		
		Use HEC digital library.	C3		
		Histology		1	
		Define Epithelium	C1		
		• Discuss general features of Epithelial cells (basal, apical and lateral surfaces)	C2		SAQ MCQ
M1-FM-A-009	Types of	Classify epithelium	C2	LGIS	VIVA
	Epithelium	• Explain the histological structure of simple epithelium	C2		VIVA
		• Describe the location and functions of simple epithelium	C2		
		Classify stratified epithelium.	C2		
		• Describe the functions and distribution of stratified epithelium	C1		

		Appreciate the differences between stratified and pseudostratified epithelium	C2				
		Describe characteristics of transitional epithelium	C2				
		Correlate clinical aspects of different types of epithelia	СЗ				
		To understand the bio-physiological aspects of different types of epithelia	C3				
		Apply the strategic use of artificial intelligence in healthcare	СЗ				
		Understand the curative and preventive health care measures.	СЗ				
		Practice principles of bioethics	С3				
		Read a relevant research article	С3				
		Use HEC digital library	C3				
		Enumerate different apical modifications of cells	C1				
of Apic		Describe histological structure of each apical modification.	C2	LGIS	SAQ		
	Specializations of Apical Cell Surface	Discuss functions of each type of apical modifications	C2		MCQ VIVA		
		2 321 33 5		Correlate clinical aspects of Specializations of apical cell surfaces	C3		
		Understand the bio-physiological aspects of specializations of apical cell surface	C2				
		Enlist causes of infertility.	C 1				
		Apply the strategic use of artificial intelligence in healthcare	C3				
		Practice principles of bioethics	C3				
		Understand the curative and preventive health care measures.	СЗ				
L	1	ı	l	1	l		

		Read a relevant research article	C3		
		Use HEC digital library	C3		
		Enumerate different cell junctions	C1		
		Describe histological structure of different cell junctions	C2		SAQ
M1-FM-A-0011	Intercellular Junctions and	Understand the bio-physiological aspects of intercellular junctions and adhesions	C2	LGIS	MCQ
	Adhesions	Apply the strategic use of artificial intelligence in healthcare	C3		VIVA
		Practice principles of bioethics	C3		
		Understand the curative and preventive health care measures.	C3		
		Read a relevant research article	C3		
		Use HEC digital library	C3		
		Define gland.	C1		
		Compare between exocrine and endocrine glands with examples.	C2	LGIS	SAQ MCQ
M1-FM-A-0012	Glandular Epithelium	Classify glands on the basis of morphology, secretory product, and mode of secretion.	C2		VIVA
		Understand the bio-physiological aspects of glands.	C2		
		Practice principles of bioethics.	C3		
		Apply the strategic use of artificial intelligence in healthcare.	C3		
		Understand the curative and preventive health care measures.	C3		
		Read a relevant research article	C3		
		Use HEC digital library	C3		
M1-FM-A-0013	Development and Histology	Describe the Sources of development of mammary gland	C2		

Of Mammary	Discuss the ultra structure of mammary gland	C2		SAQ
Gland	Discuss different stages of activity of mammary gland	C2	LGIS	MCQ VIVA
	Understand the bio-physiological aspects of mammary gland	C2		
	Correlate clinical conditions of mammary glands.	C3		
	Practice principles of bioethics	C3		
	Apply the strategic use of artificial intelligence in healthcare	C3		
	Understand the curative and preventive health care measures.	C3		
	Read a relevant research article	C3		
	Use HEC digital library	C3		

Code	Demonstration/Dissection	At the End Of The Demonstration Student Should	Learning	Teaching	Assessment
		Be Able To	Domains	Strategy	Tool
	Anatomicomedical	 Describe different anatomical planes of human body and correlate with radiological anatomy 	C2		MCQ
M1-FM-A-0014	Terminology I (Anatomical Position and Planes)	 Demonstrate anatomical position of human body Apply the strategic use of artificial intelligence in healthcare Practice principles of bioethics 	P C3 C3	Skill lab SGD	SAQ VIVA OSPE
		Read a relevant research article Define different terms releted to be dy parts.	C1		
	Anatomicomedical Terminology -II	Define different terms related to body partsDescribe axis of movement	C2		
		Demonstrate axis of movement	P		
M1-FM-A-0015		Strategic use of artificial intelligence in healthcare	C3		
		Focus on provision of curative and preventive health care services	C3	Skill lab SGD	MCQ SAQ
	(Anatomical Terms and	Practice principles of bioethics	C3	SOD	VIVA
	Axis of Movements)	Apply the strategic use of artificial intelligence in healthcare	C3		OSPE
		• Understand the curative and preventive health care	C3		

		measures.			
		Read a relevant research article	C3	1	
		Use HEC digital library	C3]	
		Define cell	C1		
		Define tissue	C1	-	
		Describe basic tissues of human body	C2]	MCQ
		Practice principles of bioethics	C3	Skill lab	SAQ
M1-FM-A-0016	Anatomicomedical Terminology -III (Cell and	Apply the strategic use of artificial intelligence in healthcare	C3	SGD	VIVA OSPE
	Tissues)	Understand the curative and preventive health care services	C3		
		Read a relevant research article	C3		
		Use digital library	C3		
		Describe general organization of different systems of body	C2		MCQ
		Discuss concepts of skin and fascia	C2	Skill lab	SAQ
		Describe the classification of blood vessels	C2	SGD	VIVA
M1-FM-A-0017	Anatomicomedical Terminology-IV (Skin and	Describe the concepts of divisions of nervous system	C1		OSPE
	Body Systems)	Describe the formation of spinal nerve	C2]	
	,	Practice principles of bioethics	C3]	
		• Understand the curative and preventive health care measures.	C3		
		 Read a relevant research article Apply strategic use of artificial intelligence in healthcare 	C3		
		Use HEC digital library	C3		
		Determine the side	C2		
N#1 FN# A 0010	GL : 1	• Demonstrate anatomical position, general features, attachments and articulations (medial and lateral).	P		
M1-FM-A-0018	Clavicle	Describe Intramembranous development and cleido-cranial dysostosis.	C3		MCQ
		Elaborate pectoral girdle formation movement and dislocation.	C3	Skill lab	SAQ VIVA
		Describe ossification in detail and Fracture Of clavicle.	C2, C3	SGD	OSPE
		Practice principles of bioethics	C3		

		Apply the strategic use of artificial intelligence in healthcare	C3		
		Understand the curative and preventive health care measures.	C3	-	
		Use HEC digital library	C3	-	
		Read a relevant research article	C3	-	
		Determine the side	C2		
			P	-	
		• Demonstrate anatomical position, general features, attachments, and articulation. (clavicle and	1		
		shoulder joints)			MCQ
		Describe scapular anastomosis and its clinical	C3	Skill lab	SAQ
M1-FM-A-0019	Scapula	significance	CJ	SGD	VIVA
		Demonstrate Scapular movements.	P	†	OSPE
		Practice principles of bioethics	C3	-	
		Apply the strategic use of artificial intelligence in	C3	-	
		healthcare			
		Focus on provision of curative and preventive	C3		
		health care services		_	
		Use HEC digital library.	C3		
		Read a relevant research article	C3		
		Determine the side	C2		
		Demonstrate anatomical position, general features,	P		
		attachments and articulation (shoulder and elbow).			
		Describe the importance of anatomical and	C2		
		surgical neck of humurus			
		Correlate axillary, radial, median and ulnar nerve	C2		
M1-FM-A-0020	Humerus	damage with respect to various fractures of			MCQ
		humerus.		Skill lab	SAQ
		Describe Significance of bicipital groove, angle of	C2	SGD	VIVA
		humeral torsion and carrying angle		1	OSPE
		Discuss Ossification and fractures	C3	1	
		• Understand the curative and preventive health care	C3		
		measures.		1	
		Apply the strategic use of artificial intelligence in	C3		
		healthcare		1	
		Practice principles of bioethics	C3	_	
		Use HEC digital library	C3		
		Read a relevant research article	C3		

M1-FM-A-0021 M1-FM-A-0021 Anterior Axioappendicular Region Anterior Axioappendicular Region • Understand the bio-physiological aspects of anterior axioappendicular region. • Understand the bio-physiological aspects of anterior axioappendicular region. • Strategic use of artificial intelligence in healthcare • Understand the curative and preventive health care measures • Practice principles of bioethics • Apply the strategic use of artificial intelligence in healthcare • Use HEC digital library • Read a relevant research article • Use HEC digital library • Identify and describe the pectoral region (origin, insertion, nerve supply, action and applied). • Understand the curative and preventive health care measures • Practice principles of bioethics • Apply the strategic use of artificial intelligence in healthcare • Use HEC digital library • Identify and describe the pectoral and clavipectoral fascia • Use HEC digital library • Understand the curative and preventive health care measures • Apply the strategic use of artificial intelligence in healthcare • Read a relevant research article • Define axilla • Define axilla • Define axilla • Describe its boundaries. • Enumerate the Contents of axilla, (axillary artery with its branches, axillary vein and tributaries, axillary lymphanics, lymph nodes and brachial plexus). • Describe the clinical significance of axillary lymph • Practice principles of bioethics						
M1-FM-A-0021 Anterior Axioappendicular Region Anterior Axioappendicular Region Anterior Axioappendicular Region Anterior Axioappendicular Region C3 Skill lab SGD ONPE Practice principles of bioethics OSPE Skill lab SGD SAQ VIVA OSPE MI-FM-A-0022 Axilla			and vessels of anterior axioappendicular region and tabulate muscles of the anterior	C2		
M1-FM-A-0021 Anterior Axioappendicular Region Anterior Axioappendicular Region • Strategic use of artificial intelligence in healthcare commeasures • Understand the curative and preventive health care measures • Practice principles of bioethics • Apply the strategic use of artificial intelligence in healthcare • Use HEC digital library • Identify and describe the pectoral and clavipectoral fascia • Use HEC digital library • Identify and describe the pectoral and clavipectoral fascia • Use HEC digital library • Use HEC digital library • Use HEC digital library • Understand the curative and preventive health care measures • Apply the strategic use of artificial intelligence in healthcare • Use HEC digital library • Understand the curative and preventive health care measures • Apply the strategic use of artificial intelligence in healthcare • Read a relevant research article • Read a relevant research article • Describe its boundaries. • Describe its boundaries. • Enumerate the Contents of axillar, (axillary artery with its branches, axillary vein and tributaries, axillary vein and tributaries, axillary lymph anders and brachial plexus). • Describe the clinical significance of axillary lymph • Skill lab SGD • Skill lab SGD • MCQ • Skill lab SGD • Practice principles of bioethics				C1		-
M1-FM-A-0022 M1-FM-A-0022 M1-FM-A-0022 M1-FM-A-0023 Axilla Axilla Axilla Axilla Understand the curative and preventive health care measures Practice principles of bioethics Apply the strategic use of artificial intelligence in healthcare Use HEC digital library C3 Tabulate muscles of the pectoral region (origin, insertion, nerve supply, action and applied). Identify and describe the pectoral and clavipectoral fascia Use HEC digital library Identify and describe the pectoral and clavipectoral fascia Use HEC digital library Understand the curative and preventive health care measures Apply the strategic use of artificial intelligence in healthcare Read a relevant research article Poescribe its boundaries. Enumerate the Contents of axilla, (axillary artery with its branches, axillary vein and tributaries, axillary lymph nodes and brachial plexus). Describe the clinical significance of axillary lymph C3 Skill lab SGD MCQ SAQ VIVA OSPE	M1-FM-A-0021			C3		_
Apply the strategic use of artificial intelligence in healthcare Use HEC digital library Vise HEC digital library Read a relevant research article Tabulate muscles of the pectoral region (origin, insertion, nerve supply, action and applied). Posterior Axioappendicular Muscles Posterior Axioappendicular Muscles Use HEC digital library Identify and describe the pectoral and clavipectoral completed of the pectoral and clavipectoral comp		Region	measures	C3	_ 505	
Posterior Axioappendicular Muscles Posterior supply, action and applied). Posterior supply action and applied. Posterior supply action and applied. Posterior supply action and applied. Posterior supply action and private action act			Apply the strategic use of artificial intelligence in	C3		
M1-FM-A-0022 Posterior Axioappendicular Muscles Posterior Axioappendicular Muscles Identify and describe the pectoral and clavipectoral cascia Use HEC digital library Understand the curative and preventive health care measures Apply the strategic use of artificial intelligence in healthcare Read a relevant research article Read a relevant research article Describe its boundaries. Enumerate the Contents of axilla, (axillary artery with its branches, axillary vein and tributaries, axillary lymph nodes and brachial plexus). Describe the clinical significance of axillary lymph C3 nodes Practice principles of bioethics MCQ SAQ VIVA OSPE MCQ SAQ VIVA OSPE			Use HEC digital library	C3		
M1-FM-A-0022 Posterior Axioappendicular Muscles Identify and describe the pectoral and clavipectoral fascia Use HEC digital library Understand the curative and preventive health care measures Apply the strategic use of artificial intelligence in healthcare Read a relevant research article Define axilla Describe its boundaries. Enumerate the Contents of axillar, (axillary artery with its branches, axillary vein and tributaries, axillary lymphatics, lymph nodes and brachial plexus). Axilla Axilla MCQ SAQ VIVA OSPE MCQ SAQ VIVA OSPE MCQ SAQ VIVA OSPE MCQ SAQ VIVA OSPE			Read a relevant research article	C3		
Axioappendicular Muscles Axioappendicular Muscles fascia				C2		-
Understand the curative and preventive health care measures Apply the strategic use of artificial intelligence in healthcare Read a relevant research article Define axilla Describe its boundaries. Enumerate the Contents of axilla, (axillary artery with its branches, axillary vein and tributaries, axillary lymphatics, lymph nodes and brachial plexus). Describe the clinical significance of axillary lymph C3 Describe the clinical significance of axillary lymph nodes Practice principles of bioethics	M1-FM-A-0022		· · · · · · · · · · · · · · · · · · ·	C2	SGD	VIVA
measures • Apply the strategic use of artificial intelligence in healthcare • Read a relevant research article • Define axilla • Describe its boundaries. • Enumerate the Contents of axilla, (axillary artery with its branches, axillary vein and tributaries, axillary lymphatics, lymph nodes and brachial plexus). • Describe the clinical significance of axillary lymph C3 nodes • Practice principles of bioethics C3 MCQ Skill lab SGD MCQ Skill lab SGD OSPE			Use HEC digital library			OSPE
healthcare Read a relevant research article Define axilla Describe its boundaries. Enumerate the Contents of axilla, (axillary artery with its branches, axillary vein and tributaries, axillary lymphatics, lymph nodes and brachial plexus). Describe the clinical significance of axillary lymph nodes Practice principles of bioethics C3 MCQ SAQ VIVA OSPE			1	C3		
• Define axilla • Define axilla • Describe its boundaries. • Enumerate the Contents of axilla, (axillary artery with its branches, axillary vein and tributaries, axillary lymph nodes and brachial plexus). • Describe the clinical significance of axillary lymph C3 nodes • Practice principles of bioethics C2 Skill lab SGD Skill lab SGD Skill lab SGD SKILL SKILL SAQ VIVA OSPE			_ == : =	C3		
M1-FM-A-0023 Axilla Axilla Describe its boundaries. Enumerate the Contents of axilla, (axillary artery with its branches, axillary vein and tributaries, axillary lymph nodes and brachial plexus). Describe the clinical significance of axillary lymph C3 nodes Practice principles of bioethics C2 Skill lab SQD VIVA OSPE			Read a relevant research article	C3		
• Enumerate the Contents of axilla, (axillary artery with its branches, axillary vein and tributaries, axillary lymphatics, lymph nodes and brachial plexus). • Describe the clinical significance of axillary lymph C3 nodes • Practice principles of bioethics C2 Skill lab SGD Skill lab SGD Skill lab SGD SKILL lab SAQ VIVA OSPE			Define axilla	C2		
M1-FM-A-0023 Axilla with its branches, axillary vein and tributaries, axillary vein and tributaries, axillary lymph nodes and brachial plexus). Describe the clinical significance of axillary lymph C3 nodes Practice principles of bioethics C2 Skill lab SQ VIVA OSPE			Describe its boundaries.	C2		
 Describe the clinical significance of axillary lymph rodes Practice principles of bioethics 	M1-FM-A-0023	Axilla	with its branches, axillary vein and tributaries, axillary lymphatics, lymph nodes and brachial	C2		SAQ VIVA
				C3		OSFL
77 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			Practice principles of bioethics			
• Understand the curative and preventive health care measures			F-1	C3		
Apply the strategic use of artificial intelligence in healthcare C3			_ == : =	C3		
Read a relevant research article C3			Read a relevant research article	C3		

		Use HEC digital library	СЗ		
		• Describe the formation of brachial plexus its roots and trunks.	C2		
M1-FM-A-0024	Brachial Plexus	Describe the origin and root value of different nerves arising	C2	01.31.1.1	MCQ SAQ
		Understand the curative and preventive health care measures	C3	Skill lab SGD	VIVA OSPE
		Practice principles of bioethics	C3	1	
		• Apply the strategic use of artificial intelligence in healthcare	C3		
		Read a research article on brachial plexus	C3		
		Use HEC digital library	C3		
		• Describe the different neurological deficits arising as a result of damaged to roots, trunks and branches of brachial plexus at different levels.	C3		
M1-FM-A-0025	Brachial Plexus Injuries	Describe the origin and root value of different nerves arising	C3	Skill lab	MCQ SAQ
		Read a research article on brachial plexus	C3	SGD	VIVA
		• Understand the curative and preventive health care measures	C3		OSPE
		Practice principles of bioethics	C3		
		• Apply the strategic use of artificial intelligence in healthcare	C3		
		Read a relevant research article	C3	<u> </u>	
		Use HEC digital library	C3		
		Describe the extent of breast	C2	-	MGO
		Describe the relations of breast	C2		MCQ
M1-FM-A-0026	Rraget	Describe structure of gland.	C2	-	
	Breast	Discuss the blood supply, venous drainage and lymphatics.	C2		
		• Correlate Clinical picture and lymphatic spread in breast carcinoma.	C3	Skill lab	SAQ VIVA
		Discuss congenital anomalies of breast	C3	SGD	OSPE
		Practice principles of bioethics	C3	1	OSIL
		Understand the curative and preventive health care measures	C3		
		Read a relevant research article	C3	1	

		Apply the strategic use of artificial intelligence in healthcare			
		Use HEC digital library	C3		
M1-FM-A-0027	Sternoclavicular and	Classify joints and discuss the attachment of capsule and ligaments and discuss the different movement on these joints along with muscles involved in these movements.	C2	Skill lab	MCQ
	acromioclavicular joints	Describe neurovascular supply.	C2	SGD	SAQ
		Understand the curative and preventive health care measures	C3		VIVA OSPE
		Practice principles of bioethics	C3	7	
		Apply the strategic use of artificial intelligence in healthcare	C3		
		Read a relevant research article	C3		
		Use HEC digital library	C3		
		• Discuss the surface anatomy of axioappendicular region.	C2		
M1-FM-A-0028	Surface Anatomy & Radiology	Interpret the normal radiologic appearance of bones in axioappendicular region.	C3	Skill lab SGD	MCQ VIVA
		Apply the strategic use of artificial intelligence in healthcare	C3		OSPE
		Practice principles of bioethics	C3		
		Understand the curative and preventive health care measures	C3		
		Read a relevant research article	C3	7	
		Use HEC digital library	C3	<u>] </u>	

Code	Topics Of SDL	Learning Objectives	Learning Resources
M1-FM-A-0029	Clavicle	 Determine the side Demonstrate anatomical position, general features, attachments and articulations (medial and lateral). Describe Intramembranous development. Describe ossification in detail and Fracture of Clavicle Able to read a relevant research article 	 Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. Clavicle (Chapter 3, Page143,153,154). https://www.youtube.com/watch?v=Ykfzt-olaYs
M1-FM-A-0030	Scapular Anastomosis and Its Clinical Significance	 Determine the side Demonstrate anatomical position, general features, attachments and articulations (medial and lateral). Describe scapular anastomosis and its clinical significance Able to read a relevant research article 	 Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. Scapula (Chapter 3, Page143-145,154,171,172). https://www.youtube.com/watch?v=zFawNgaSL6E
M1-FM-A-0031	Anterior axioappendicular muscles	 Describe Superficial fascia with cutaneous nerve and vessels of anterior axioappendicular region. Understand the bio-physiological aspects of anterior axioappendicular region. Able to read a relevant research article and use digital library 	 Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. Anterior axioappendicular muscles (Chapter 3, Page 168,169). https://teachmeanatomy.info/
M1-FM-A-0032	Posterior axioappendicular muscles	 Tabulate Muscles of the pectoral region (origin, insertion, nerve supply, action and applied). Identify and describe the pectoral and clavipectoral fascia. Able to read a relevant research article and use digital library 	 Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. Posterior axioappendicular muscles (Chapter 3, Page 170,171). https://teachmeanatomy.info/
M1-FM-A-0033	Axilla	 Define axilla Describe its boundaries, Enumerate the Contents of axilla, (axillary artery with its branches, axillary vein and tributaries, axillary lymphatics, lymph nodes and brachial plexus). 	 Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. Axilla (Chapter 3, Page 183-190,197,198). https://teachmeanatomy.info/ https://www.youtube.com/watch?v=uSMugI_NNJc
M1-FM-A-0034	Brachial plexus	 Describe the formation of brachial plexus its roots and trunks. Describe the origin and root values of different nerves arising 	 Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. Brachial plexus (Chapter 3, Page 191-196). https://www.youtube.com/watch?v=1qgqrXlpr1Y

		 Able to read a research article on brachial plexus Able to use digital library 	
M1-FM-A-0035	Brachial plexus injuries	 Describe the different neurological deficits arising as a result of damaged to roots, trunks and branches of brachial plexus at different levels. Able to read a research article on brachial plexus 	 Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. Brachial plexus injuries (Chapter 3, Page 199- 200). https://teachmeanatomy.info/ https://www.youtube.com/watch?v=c9giLkwgYA0
M1-FM-A-0036	Breast	 Describe the extent of breast Describe the relations of breast Describe structure of gland. Discuss related clinical 	 Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. Breast (Chapter 4, Page 315-318,323-326). https://www.youtube.com/watch?v=OW0qQnT5GoA

		Practicals			
Code	Practical	At The End Of The Practical Student Should Be Able To	Learning Domains	Teaching Strategy	Assessment Tool
		Identify different types of microscopes.	C1		
	Introduction to	Describe functions of different parts of microscope.	C1	Skill lab	OSPE
M1-FM-A-0037	Microscope	Identify different types of lenses.	C1	Demonstration	
W11-1 W1-A-0037		Focus slides.	P		
		Classify epithelium.	C2		
M1-FM-A-0038	Simple epithelium	Illustrate different types of simple epithelium	P	Skill lab	OSPE
		Identify types of simple epithelium.	P	Demonstration	
		Write two points of identification	C1		
	Stratified	Classify stratified epithelium.	C1		
		Illustrate different types of stratified epithelium	C1	Skill lab	OSPE
M1-FM-A-0039	epithelium	Discuss functions of stratified epithelium	C2	Demonstration	
WII-IWI-A-0039	/Transitional	Enlist sites of specific type of epithelium	C2		
	Epithelium	Identify epithelium under microscope	C1		
		Write two points of identification	P		
		Illustrate the different stages of activity of mammary gland	C2	Skill lab	
M1-FM-A-0040	Mammary gland	Identify the slides of different stages of mammary gland	P	Demonstration	OSPE

		Physiology			
		Theory			
Code	Topic	Learning Objectives At the End of Lecture Students Should Be Able To:	Learning Domain	Teaching Strategy	Assessment Tools
		Introduce faculty members	C 1		
M1-FM-P-001	Introduction to	Define physiology	C2		SAQ
	Physiology & Physiology	Classify different branches of physiology	C2	LGIS SGD	MCQ
	Department	Explain the importance of physiology in medical and clinical sciences	C1		VIVA
		Understand functional organization of human body from cell to systems	C2	LGIS	M SAQ
M1-FM-P-002		Differentiate between prokaryotes and eukaryotes.	C2	SGD	MCQ
& Homeo	& Homeostasis	Discuss salient features of cell theory	C2		VIVA
		Define homeostasis	C 1		
		Describe homeostatic mechanisms of the major functional systems.	C1	_	
		Describe distribution of total body water	C 1		
M1-FM-P-003	Concept of Body	Enlist the proportion of intra cellular and extra cellular fluids.	C1	LGIS SGD	SAQ MCQ
	Fluid and Internal	Differentiate between ECF & ICF	C2		VIVA
	Environment	Recall Physical characteristics of normal ECF constituents	C 1		
		Understand the concept of internal environment (which student can differentiate for unicellular and multi cellular organisms.)	C2		
		Describe the characteristic of control system of the body.	C 1		
		Enlist four control mechanisms of body	C 1	LGIS	SAQ
M1-FM-P-004	Homeostatic Control System I	Understand the mechanism of positive feedback, negative feedback, feed forward control and adaptive control with examples.	C2	SGD	MCQ VIVA

		Recall control mechanisms	C1		
		Give examples	C1		SAQ
M1-FM-P-005	Homeostatic Control System II	Compare and contrast feed forward and adaptive mechanisms	C2	LGIS SGD	MCQ VIVA
	11	Define gain of control system	C1		
		Comprehend gain of the control system	C2		
		Calculate gain of the feedback system and understand the significance of sign in the formula	C3		
		Describe cytoskeleton & cell locomotion	C1		
		Discuss functions of cilia and amoeboid movement	C2	LGIS	SAQ
M1-FM-P-006	Cellular organelles and cell functions	Describe the mechanism of ATP generation	C1	Group presentations	MCQ
		Enlist three major processes of ATP consumption in the body	C1	presentations	VIVA
		Understand cell ingestion and other independent roles of cell	C2		
		Enlist functions of ER, golgi apparatus, lysosome & perxosome, mitochondria	C1	LGIS	SAQ
	Cell Membrane and Cell	Compare and contrast RER & SER, lysosomes & peroxisomes	C2	SGD	MCQ
M1-FM-P-007	Organelles, I & II	Understand Docking mechanism	C2	Group presentations	VIVA
	11	Discuss physiological importance of mitochondria & ATP	C2		
		Describe the structure of cell membrane: fluid mosaic model	C1		
		Enlist functions of cell membrane	C1		
		Enlist membrane bound and non-membrane bound organelles	C1		
		Differentiate between cytoplasm and cytosol	C2		
M1-FM-P-008		Enlist various types of ion channels	C1		

	Cell membrane Ion channels,	Enumerate modes of transport mechanism across the cell membrane	C1	LGIS SGD	SAQ MCQ
	Transport across the cell membrane: Diffusion	Define and discuss factors affecting diffusion	C1		VIVA
	Transport across	Recall transport mechanism across the cell membrane with special emphasis on osmosis and osmotic pressure	C1		SAQ
M1-FM-P-009	cell membrane: Osmosis	Recall factors affecting osmosis	C1	LGIS	MCQ
		Comprehend the concept of moles and osmoles	C2	SGD	VIVA
		Recall osmolarity of body fluids	C1		
		Discuss tonicity	C2		
		Comprehend concept of isotonic, hypertonic and hypotonic	C2		
	Transport across	Define active transport	C1		
M1-FM-P-0010	cell membrane: Active transport	Classify active transport	C2	LGIS	SAQ
	I & II	Comprehend various types of active transport with examples with special emphasis on Na-K pump	C2	SGD	MCQ VIVA
	G, , C	Describe structure of nucleus and ribosome	C1		
	Structure of nucleus and	Discuss vaults	C2		
	ribosomes,	Understand basic concepts about DNA and	C2	LGIS	SAQ
M1-FM-P-0011	Cell Division	• RNA	C1	PBL	MCQs
		Recall various types of RNA and their functions	C1		VIVA
		Enlist and Draw steps of mitosis and meiosis	C2		
		Comprehend role of different parts of chain of DNA as genes like TATA box			
	Genetics	Define & Explain Genetics, Transcription & Translation			SAQ
	Transcription & Translation	Describe Genetic control of protein synthesis		LGIS	MCQs
M1-FM-P-0012	Tansianon	Differentiate between apoptosis & Necrosis		PBL	VIVA

	Cellular control mechanism, Cell cycle, Programmed cell death	Describe different cellular control mechanisms regarding gene regulation	C1	LGIS	SAQ
		Explain Cell differentiation, apoptosis and cellular changes in cancer	C2	PBL	MCQs VIVA
	Intracellular	Describe the structure of various intracellular connections	C1		
M1-FM-P-0013	communication and cell junctions	Give the physiological importance of cell junctions	C1	LGIS	SAQ
				SGD	MCQ
					VIVA
		Describe the various 2nd messenger systems	C1		SAQ
M1-FM-P-0014	Signal	Discuss physiological significance	C2	LGIS	MCQ
	Transduction				VIVA

Code	Topic	Learning Objectives	Learning	Teaching	Assessment
			Domain	Strategy	Tools
		Understand functional organization of human body	C2		MCQ
M1-FM-P-0015	Cell and	Discuss homeostasis/control systems of the body	C2	SGD	SAQ
	homeostasis				VIVA
		Discuss the functions of cell	C2		MCQ
M1-FM-P-0016	Cell cytoskeleton	Describe cell cytoskelation	C1	SGD	SAQ
	and locomotion	·			VIVA
	and cell functions				
		Describe the structure of cell membrane	C1		
M1-FM-P-0017	Transport across	Enlist various ion channels	C1	SGD	MCQ
		Discuss transport mechanism across the cell membrane with	C2		SAQ
	cell membrane	special emphasis on diffusion and osmosis			VIVA
		Explain the types of active transport	C2		
M1-FM-P-0018	Intracellular	Describe the structure and function of various intracellular	C1		MCQ
	communication	connections	C2	SGD	SAQ
	and cell junction,	Discuss second messanger system			VIVA
	signal				VIVA
	transduction				

Code	Topics Of SDL	Learning Objectives	Learning Resources
M1-FM-P-0019	Concept of body fluids & internal environment.	 Introduction Concept of extracellular and intracellular fluid Homeostasis Examples of control system 	 Ganong's Review of Medical Physiology.25THEdition, General principles and Energy production Medical Physiology (chapter 01, Page 03) Human Physiology by Dee Unglaub Silver thorn. 8THEdition.Introduction to physiology, controlsystems and homeostasis, chapter no. 1, page no. 40.49 Physiology by Linda S. Costanzo 6th Edition. Cellular physiology, chapter 01. Page 1 Textbook of Medical Physiology by Guyton & Hall.14th Edition. Introduction to Physiology. (Section 01, Chapter1, page 03).
M1-FM-P-0020	Cell membrane & classification ofcell organelles	 Structure of cell membrane Cell cytoskeleton Cytoplasm and various organelles Golgi Apparatus and its function Lysosomes and peroxisomes Secretory vesicles 	 Ganong's Review of Medical Physiology.25THEditions, Overview of Cellular Physiology inMedical Physiology (chapter 02, Page33) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. Compartmentation, chapter 3, page95 Physiological Basis of Medical Practice by Best & Taylor's.13thEdition. The cell (chapter 01, section 1 Page 03, 18) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Introduction to Physiology.(Section 1, chapter 03, page 31)
M1-FM-P-0021	Intracellular communication and celljunction	 Receptors and its types Cellular signaling and various mechanisms Signal transduction Hormone receptors and their activation Second messenger mechanisms 	 Ganong's Review of Medical Physiology.25THEdition., Overview of Cellular Physiology inMedical Physiology (chapter 02, Page 33-44) Human Physiology by Dee Unglaub Silver thorn. 8THEdition. Compartmentation, chapter 3, page 109 Physiology by Linda S. Costanzo 6th Edition. Gastrointestinal Physiology Physiological Basis of Medical Practice by Best & Taylor's.13th EditionThe cell (chapter 01, Page 14) Textbook of Medical Physiology by Guyton & Hall.14thEdition. Introduction to Endocrinology.(Section 14, Page 920)
M1-FM-P-0022	Receptors and signal transduction	 Receptors and its types Cellular signaling and various mechanisms Signal transduction 	 Ganong's Review of Medical Physiology.25THEditions, Overview of Cellular Physiology inMedical Physiology (Chapter 02, Page 41) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. Communication, chapter 6, page 204 Physiological Basis of Medical Practice by Best &

		 Hormone receptors and their activation Second messenger mechanisms 	 Taylor's.13th Edition. Section 7, principles ofhormone action and endocrine control (Chapter 50, Page817) ❖ Textbook of Medical Physiology by Guyton & Hall.14th Edition. Introduction to Physiology.(Section 1, Chapter 02, page 13)
M1-FM-P-0023	Homeostasis Control System- I (Negative Feedback System, Conceptof Error and Gain)	 Control systems of body Negative and positive feedback mechanism and their examples Apoptosis and necrosis 	 Ganong's Review of Medical Physiology.25THEdition, Overview of Cellular Physiology inMedical Physiology (Chapter 02, Page 62) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. Introduction to physiology, chapterno. 1, page no. 45 Textbook of Medical Physiology by Guyton & Hall.14th Edition. Introduction to Physiology.(Section 1, Chapter 1, page 04,07) (Chapter 03, Page 45)
M1-FM-P 0024	Genetics, Transcriptionand Translation	 Building blocks of DNA Genetic code Process of transcription and translation Types of RNA Cell division 	 Ganong's Review of Medical Physiology.25THEdition, General principles and Energy production Medical Physiology (Chapter 01, Page 63) Textbook of Medical Physiology by Guyton & Hall.14thEdition. (Section 01, Chapter 03, Page 31)
M1-FM-P-0025	Structure of Nucleus, Ribosomes and Cell Division	 Structure of Nucleus Ribosomes Mitosis & Overview of cancer 	 Ganong's Review of Medical Physiology.25THEdition, Overview of Cellular Physiology inMedical Physiology (Chapter 02, Page42) Human Physiology by Dee Unglaub Silver thorn. 8THEdition. Compartmentation, chapter 3, page 100 Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. the cell (Chapter 01, Page7,) Textbook of Medical Physiology by Guyton & Hall.14thEdition. (Section 01, Chapter02, Page 19)
M1-FM-P-0026	Transport across cell membrane andits various types (osmosis, diffusion, primary and secondary active transport	 Types of transport across cell membrane Diffusion and osmosis Concept of gating of channels Primary active transport Secondary active transport 	 Ganong's Review of Medical Physiology.25THEdition, Overview of Cellular Physiology in Medical Physiology (Chapter 02, Page 45) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. Membrane dynamics chapter 5,page 160 Physiology by Linda S. Costanzo 6th Edition. Cellular physiology, chapter 1, page 5 Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Properties and functions of cell membrane, chapter 2, page 18 Textbook of Medical Physiology by Guyton & Hall.14th Edition. Membrane Physiology. (Section 02, Chapter 04, Page 51)

	Practicals						
Code	Topic	Learning Objectives	Learning Domain	Teaching Strategy	Assessment Tool		
M1-FM-P-0027	Introduction to Microscope	• Identification of different parts especially focusing lenses and their uses	C1	Skill Lab	OSPE		
		Focusing technique of different blood slides e.g Neubauer's chamber TLC & DLC slides	P				
	Introduction to Wintrobe & Westergen tube	Identify the wintrobe and westergen tubes	C1	Skill Lab	OSPE		
M1-FM-P-0028		Should know the differences between two tubes and uses in different methods	Р	Skill Lab	OSFE		
	Apparatus identification (Introduction to Neubauer's chamber, Red Blood Cell (RBC)	Complete study of Neubauer's slide, calculation of volumes of corner squares and central squares	Р	Skill Lab	OSPE		
M1-FM-P-0029		Important differentiating points between WBC & RBC's pipettes	C1				
	pipettes& White	How to dilute the two pipettes	P				
	Blood Cell (WBC) pipette	Should know the composition of diluting fluids	C1				
M1-FM-P-0030	Apparatus identification (Introduction to centrifuge machine)	Be aware with the electrical connections of centrifuge machine and to control different speeds	P, A	Skill Lab	OSPE		

		Biochemistry			
		Theory			
Code	Topic	Learning Objectives	Learning	Teaching	Assessment
		At the End Of Lecture Students Should Be Able To	Domain	Strategy	Tool
		Cell organelles			•
		Explain composition of normal cell	C2		
		Describe methods to separate different organelles of cell			
		 Describe structure, functions and marker enzymes of ER & Golgi apparatus 	C2		
M1-FM-B-001	Cell and cell organelles	Describe structure, functions and marker enzymes of	C2		MCQs,
		lysosome, peroxisome & ribosome		LGIS	SAQs &
		Describe structure, functions and marker enzymes of mitochondria and Nucleus	C2		Viva
		Illustrate the clinical conditions and congenital defects of	C2		
		cell organelles	C3		
		Cell membrane and transport across cell membrane		T	T
		Explain composition of cell membrane Lindarate of fluid massis and deli	C2		MCQs, SAQs &
M1-FM-B-002	Cell membrane	Understand fluid mosaic modelDescribe functions performed by each component	C2	LGIS	Viva
		Describe functions performed by each component	C2		
	Functions of cell	Discuss functions & importance of cell membrane	C2		MCQs,
M1-FM-B-003	membranes			LGIS	SAQs & Viva
		Explain transport of various substances by active and	C2		Viva
M1-FM-B-004	Transment coness call	• Explain transport of various substances by active and passive transport, diffusion, phagocytosis, endocytosis	C2		MCOa
M1-FM-B-004	Transport across cell membrane	and exocytosis		LOIG	MCQs, SAQs &
		Correlate the clinical disorders with defective transport across cell membrane		LGIS	Viva
		across cen memorane			
			C3		
		Physicochemical properties of cell		T	
		Define osmosis and osmotic pressure. District the state of the s	C1		MCQs,
M1-FM-B-005		• Discuss biochemical application of osmotic and oncotic pressure and methods to measure them.	C2	LGIS	SAQs & Viva
		probable and medicab to measure mem.			

	Osmosis, osmotic pressure and oncotic pressure	Correlate oncotic pressure with clinical scenarios	C3		
	Phenomenon of viscosity, surface	Define phenomenon of viscosity, surface tension, emulsification and adsorption	C1		
M1-FM-B-006	tension, emulsification and adsorption	Explain Biochemical applications and methods to measure them	C2	LGIS	MCQs, SAQs & Viva
	Donnan equilibrium,	Define Donnan equilibrium, adsorption and ion exchange	C1		
M1-FM-B-007	adsorption and ion exchange resins	resins. • Describe their effects on tissue fluids and biochemical importance	C2	LGIS	MCQs, SAQs & Viva
		Define pH, Pka, body buffer	C1		MCQs,
M1-FM-B-008	Water and pH	Discuss water distribution in the body	C2	LGIS	SAQs & Viva
	• Understand d	Understand dehydration and overhydration	C3		Viva
		Enzymes			<u> </u>
		Define Enzymes.	C1		MCQs,
M1-FM-B-009	Enzymes Introduction	Explain general functions of enzymes. Differentiate between an arrangement of a feet and a feet arrangement.	C2	LGIS	SAQs & Viva
		Differentiate between coenzyme and cofactors	C2		VIVA
M1-FM-B-0010	Mechanism of enzyme action	Describe different mechanisms of enzyme action.	C2	LGIS	MCQs, SAQs & Viva
M1-FM-B-0011	Classification of enzymes	Discuss different classes of Enzymes	C2	LGIS	MCQs, SAQs & Viva
M1-FM-B-0012	Properties of Enzymes	Elaborate the Properties of Enzymes such as specificity for substrate and stereo specificity.	C2	LGIS	MCQs, SAQs & Viva
M1-FM-B-0013	Factors affecting Enzyme action	Discuss different factors which increase or decrease the activity of enzymes	C2	LGIS	MCQs, SAQs & Viva

Enzyme inhibitors	Describe enzyme inhibitors and how the activity of the regulatory enzymes can be modulated for benefit of body	C2	LGIS	MCQs, SAQs & Viva
Enzyme Regulation	Explain enzyme regulation	C2	LGIS	MCQs, SAQs & Viva
Diagnostic role of Enzymes	 Interpret the role of measuring activity of different enzymes in the diagnosis and prognosis of different diseases Interpret the role of Enzyme as medicine and their effects on body. 	C3	LGIS	MCQs, SAQs & Viva
	Genetics & Cancer		-	-
	 Explain structure and biological importance of DNA, types of DNA Differentiate between DNA &RNA 	C2		MCQs,
Nucleic acids chemistry	Explain structure, types and functions of RNA	C2 C2	LGIS	SAQs & Viva
Replication	Describe mechanism of replication of prokaryotes & Eukaryotes	C2	LGIS	MCQs, SAQs & Viva
Transcription	Describe mechanism of Transcription of prokaryotes & Eukaryotes	C2	LGIS	MCQs, SAQs & Viva
Translation	 Discuss genetic code Describe mechanism of Translation in prokaryotes & Eukaryotes Illustrate mechanism of action of antibiotics at different stages of translation 	C2 C2	LGIS	MCQs, SAQs & Viva
		C3		
DNA damage & Repair	 Describe mechanism of DNA damage & Repair Apply knowledge of DNA repair mechanisms in related clinical cases 	C2	LGIS	MCQs, SAQs & Viva
	Enzyme Regulation Diagnostic role of Enzymes Nucleic acids chemistry Replication Transcription Translation	Enzyme inhibitors Enzyme Regulation Enzyme Regulation Diagnostic role of Enzymes Interpret the role of measuring activity of different enzymes in the diagnosis and prognosis of different diseases Interpret the role of Enzyme as medicine and their effects on body. Genetics & Cancer Explain structure and biological importance of DNA, types of DNA Differentiate between DNA &RNA Explain structure, types and functions of RNA Differentiate between DNA contains of replication of prokaryotes & Eukaryotes Transcription Discuss genetic code Describe mechanism of Transcription of prokaryotes & Eukaryotes Illustrate mechanism of action of antibiotics at different stages of translation DNA damage & Repair DNA damage & Repair	Enzyme inhibitors Penzyme Regulation Enzyme Regulation Enzyme Regulation Enzymes (an interpret the role of measuring activity of different enzymes in the diagnosis and prognosis of different diseases (assasses) Interpret the role of Enzyme as medicine and their effects on body. Genetics & Cancer Explain structure and biological importance of DNA, types of DNA Differentiate between DNA &RNA Explain structure, types and functions of RNA Explain structure, types and functions of RNA Explain structure, types and functions of PNA Explain structure, types and functions of RNA C2 C2 Describe mechanism of Transcription of prokaryotes & Eukaryotes C3 Discuss genetic code Describe mechanism of Translation in prokaryotes & Eukaryotes Elikaryotes Discuss genetic code Describe mechanism of Translation in prokaryotes & Eukaryotes Elikaryotes Discuss genetic code Describe mechanism of action of antibiotics at different stages of translation C3 DNA damage & Repair Apply knowledge of DNA repair mechanisms in related	Enzyme inhibitors Finzyme Regulation Parameter of the property of the pro

M1-FM-B-0022	Mutations	Describe different types of mutations with examples	C2	LGIS	MCQs, SAQs & Viva
M1-FM-B-0023	PCR and Recombinant DNA technology	 Define PCR Explain mechanism and indications of PCR Discuss Recombinant DNA technology 	C1 C2 C2	LGIS	MCQs, SAQs & Viva
M1-FM-B-0024	Cancer	Explain biochemical basis of cancer	C2	LGIS	MCQs, SAQs & Viva

Code	Topic	Learning Objectives	Learning Domain	Teaching Strategy	Assessment Tools
		Explain Composition of Normal Cell & Cell Organelles	C2		MCQ
M1-FM-B-0025	Cell and Cell Membrane	Describe Composition of Cell Membrane	C2	SGD	SAQ
		Understand Fluid Mosaic Model			VIVA
		Define osmosis and osmotic pressure.	C1		
	Physicochemical	Discuss biochemical application of osmotic and oncotic	C2	SGD	MCQ
		pressure and methods to measure them.	C3		SAQ
M1-FM-B-0026		Correlate oncotic pressure with clinical scenarios			VIVA
	Aspects of Cell	Define phenomenon of viscosity, surface tension.	C1		
		Explain Biochemical applications and methods to measure	C2		
		them.			
		Define Donnan equilibrium, adsorption and ion exchange	C1		MCQ
		resins.	C2	SGD	SAQ
		Describe their effects on tissue fluids and biochemical			VIVA
		importance			, , , , , ,

Code	Topics Of SDL	Learning Objectives	Learning Resources
M1-FM-B-0027	Cell and cell organelles	 Explain composition of normal cell Describe methods to separate different organelles of cell Describe structure, functions and marker enzymes of ER & Golgi apparatus Describe structure, functions and marker enzymes of lysosome, peroxisome & ribosome Describe structure, functions and marker enzymes of mitochondria and Nucleus 	★ Essentials of medical Biochemistry. Mushtaq Ahmad Vol – I 9 th edition (chapter 1, page 3)

M1-FM-B-0028	Cell membrane Transport across cell membrane	 Illustrate the clinical conditions and congenital defects of cell organelles Explain composition of cell membrane Understand fluid mosaic model Describe functions performed by each component Explain transport of various substances by active and passive transport, diffusion, phagocytosis, endocytosis and exocytosis Correlate the clinical disorders with defective transport across cell membrane 	 Harper's illustrated biochemistry 32nd edition (chapter 40 page - 460) Harper's illustrated biochemistry 32nd edition (Chapter 40 page 467)
M1-FM-B-0029	Physichemical Aspects Osmosis, osmotic pressure and oncotic pressure	 Define osmosis and osmotic pressure. Discuss biochemical application of osmotic and oncotic pressure and methods to measure them. Correlate oncotic pressure with clinical scenarios 	 Essentials of medical Biochemistry. Mushtaq Ahmad Vol – I 9th edition (Chapter 02 page 46)
M1-FM-B-0030	Phenomenon of viscosity, surface tension.	 Define phenomenon of viscosity, surface tension. Explain Biochemical applications and methods to measure them. 	 ❖ Essentials of medical Biochemistry. Mushtaq Ahmad Vol − I 9th edition (Chapter 02 page 52, 55)
M1-FM-B-0031	Nucleic Acid Chemistry	 Define Donnan equilibrium, adsorption and ion exchange resins. Describe their effects on tissue fluids and biochemical importance 	 Essentials of medical Biochemistry. Mushtaq Ahmad Vol – I 9th edition (Chapter 02 page 50)
M1-FM-B-0032	Cancer	• Explain biochemical basis of cancer	 ❖ Essentials of medical Biochemistry. Mushtaq Ahmad Vol − I 9th edition (Chapter 6 page 168)
M1-FM-B-0033	Diagnostics Role of Enzyme	Interpret the role of Enzyme in diagnosis and their effects on body.	 Essentials of medical Biochemistry. Mushtaq Ahmad Vol – I 9th edition (Chapter 06 page 169) Lippincott Illustrated reviews of biochemistry 8th edition (Chapter 05 page 69)
M1-FM-B-0034	Transcription	Describe mechanism of Transcription of prokaryotes & Eukaryotes	Lippincott Illustrated reviews of biochemistry 8 th edition (Chapter 30 pag 459)

Practicals					
Code	Topic	Learning Objectives At The End Of Practical Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
M1-FM-B-0035	Introduction to Laboratory precautions and glassware	 Understand the use of laboratory glassware State precautions while working in the laboratory 	Р	Skill Lab	OSPE
M1-FM-B-0036	Introduction of Laboratory equipment's	Describe parts and working of different laboratory equipments	P	Skill Lab	OSPE
M1-FM-B-0037	Physic chemical principals: emulsification and surface tension	Demonstrate mechanism of surface tension and emulsification	Р	Skill Lab	OSPE
M1-FM-B-0038	Physic chemical principals: tonicity and adsorption	 Demonstrate effects of solutions of different tonicity on red cells (isotonic, hypotonic and hypertonic) Illustrate process of adsorption. 	P	Skill Lab	OSPE

	Orientation Sessions of Medical Education and Management Courses				
	Program of Welcom	e Ceremony			
Sr. No.	Activity	Name	Time		
1.	Seating of Students in Auditorium		8.00AM To 8:30AM		
2.	Welcome words and announcement of the Ceremony	Dr. Sidra Hamid	9:00AM		
3.	Tilawat-e-Quran Pak	Dr. Fahad Anwar	9:05AM		
4.	Haddiya-e-Naat	Mr. Waqar	9:10AM		
5.	Invitation to distinguished guests on Stage	L	9:15AM		
6.	Vice Chancellor welcome address	Prof. Dr. Muhammad Umar	9:30AM		
7.	Welcome address by Principal RMC	Prof. Dr. Jahangir Sarwar Khan	9:45AM		
8.	White Coat Ceremony (05 High achievers among boys) (5 High achievers among girls)	Prof. Dr Muhammad Umar	10:00AM		
9.	Oath Taking	Prof. Dr. Muhammad Umar	10:15AM		
10.	Welcome Note by Director DME	Prof. Dr Rai Muhammad Asghar	10:30AM		
11.	Introduction to IT services RMU by Director IT	Mr. Hafiz Shahid Rasool	10:45AM		
12.	Introduction to Hostel & Transportation	Prof. Dr. Naeem Zia	11:00AM		
	Concluding remarks by l	Dr. Sidra Hamid	<u>I</u>		

		Medical Education		
		Theory		
Code	Topic	Learning Objectives	Teaching	Assessment
		At the end of the lecture the student should be able to	Strategy	Tool
M1-FM-VI(ME)-001	Orientation of Integrated	Understand the concept of integration		
WIT-11WI- V I(WIL)-001	Modular system,	Understand the orientation of integrated modular curriculum of RMU		
	Intoduction to study guides and RMU Policies	How to use Study Guides	LGIS	MCQs
	and RWO I oncies	Introduction to different policies of RMU		
M1-FM-VI(ME)-002		Discuss the concept of Continous internal assessment	LGIS	MCQs
	Introduction to Assessment Model of RMU	To comprehend the rules of eligibility of professional examination	LOIS	MCQs
M1-FM-VI(ME)-003		Introduction to LMS, CMS and MS Teams.	LGIS	MCQs
M11-FM-V1(ME)-003	RMU Goes digital	Inrtorduction to RMU website	LOIS	MCQS
	Kivio Goes digital	How to use HEC digital library		
		How to use up to date website		
M1-FM-VI(ME)-004	Vision & Mission	Discuss the vision and mission of RMU		MCQs
W11-1 W1- V1(WIL)-004	VISION & IVIISSION	Discuss the implications of under standing vision and mission of and organization	LGIS	MCQs
M1-FM-VI(ME)-005	Leadership	Define clinical leadership		
WIT-TWI- V I(WIE)-003	Leadership	Differentiate between management and leadership	LGIS	MCQs
		Types of leadership style		
M1-FM-VI(ME)-006		Define medical professionalism	LGIS	MCOs
M11-1.M1- A I(ME)-000	Professionalism	Describe attributes of healer and professional	LOIS	MCQs
	1 TOTESSIONALISM	Discuss the social contract of medical profession		
		List values, skills and behavior for professionalism		
M1-FM-VI(ME)-007		Receive and provide effective feedback	I CIG	MCOa
	Lecture on feedback	Describe types of feedback	LGIS	MCQs

		Discuss principles of feedback		
		Discuss essential elements of feedback		
M1-FM-VI(ME)-008	Islam and Medical Science	Discuss role of Islam and importance of Islam in Medical Science	LGIS	MCQs

Basic and Clinical Sciences (Vertical Integration)

	Anatomy, Physiology, & Biochemistry					
		Clinical Themes				
Subject	Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain			
Anotomy	Fracture of clavicle	Apply basic knowledge of subject to study clinical case.	C3			
Anatomy	Winging of scapula due to long thoracic nerve injury	Apply basic knowledge of subject to study clinical case.	C3			
Physiology	Down's syndrome	Apply basic knowledge of subject to study clinical case.	C3			
Filysiology	Smoker's cough	Apply basic knowledge of subject to study clinical case.	C3			
Biochemistry	• Enzymes	Apply basic knowledge of subject to study clinical case.	C3			
Diochemistry	Genetics/PCR	Apply basic knowledge of subject to study clinical case.	C3			

		Pathology			
		Theory			
Code	Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain	Teaching Strategy	Assessment Tools
M1-FM-VI(Path)-001	Introduction to Pathology	 Define the following terms: Etiology Pathogenesis Morphology 	C1	LGIS SGD	MCQ
M1-FM-VI(Path)-002	Cellular Responses to Injury	 Discuss cellular responses to injury for: Reversible injury Adaptation Irreversible injury Cell death Describe, the morphologic changes in cell injury culminating in necrosis and apoptosis 	C2 C2	LGIS SGD	MCQ
M1-FM-VI(Path)-003	Intracellular Accumulations	 Describe types of intracellular accumulations with clinical examples: Lipids/ fat Protein Glycogen Pigments Explain mechanism of intracellular accumulations. Enlist causes of fatty change Describe the pathogenesis of fatty liver 	C2 C2 C1	LGIS SGD	MCQ
M1-FM-VI(Path)-004	Pigments	 Describe the pathogenesis of fatty liver Classify pigments Explain the mechanism of pigment production and deposition in various clinical settings Describe the morphological features (gross/ microscopic) with deposition of following pigments: 	C2 C2 C1	LGIS SGD	MCQ

		Lipofuscin, Melani, Hemosiderin, Bilirubin, Anthracosis			
		1. Define ROS/free radicals	C1		
	Free Radicals/ Reactive	2. Enlist oxygen derived free radicals	C1		
M1-FM-VI(Path)-005	Oxygen Species (Ros).	3. Describe mechanism of generation of free radicals	C2	LGIS	
	Oxidative Stress	4. Describe mechanism of removal of free radicals(antioxidants)	C2	SGD	MCQ
		5. Describe the pathologic effects of free radicals	C2		
		Define necrosis	C1	LCIC	MCO
M1-FM-VI(Path)-006 Irreversible Injury Necrosis	Irreversible Injury.	Enlist patterns/types with clinical examples	C1	LGIS SGD	MCQ
	Necrosis	Describe morphological changes (gross and microscopic) in necrosis	C2	_ SGD	
	Apoptosis (Irreversible Injury)	Define apoptosis	C1	- LGIS SGD	MCO
		Enlist clinical examples of apoptosis in	C1		MCQ
M1-FM-VI(Path)-007		physiologic conditions		SGD	
		Enlist clinical examples of apoptosis in pathologic conditions	C1		
		Describe mechanism of apoptosis	C2		
		Tabulate differences between necrosis and apoptosis	C1		
		Classify human genetic disorders	C1	LGIS	MCO
		Define mutation	C1	SGD	MCQ
M1-FM-VI(Path)-008		Define the following inheritance pattern:	C1	PBL	
	Genetic Disorders	Autosomal dominant		I DL	
		Autosomal recessiveX-linked			
		Describe diseases associated with consanguineous marriages	C2	1	

	Pharmacology						
		Theory					
Code	Topic	Learning Objectives	Learning	Teaching	Assessment		
		At the end of the lecture the student should be able to	Domain	Strategy	Tool		
		Define pharmacology	C1				
361 736		Discuss main branches of Pharmacology	C2	. G.10	1.600		
M1-FM- VI(Pharm)-001	Introduction to Pharmacology	Define drug according to WHO	C1	LGIS	MCQ		
		Describe drug nomenclature	C1				
		Cite important drug references	C1				
		Describe the sources of drug	C2				
M1-FM-	Routes of drug	Enlist different routes of drug administration	C1	LGIS	MCQ		
VI(Pharm)-002		Discuss the merits and demerits of each route of drug administration	C2	LOIS	WicQ		
		Identify the factors the influence the choice of the route of drug administration	C2				
M1-FM-	Absorption of drugs	Define drug absorption	C1				
VI(Pharm)-003	Absorption of drugs	Identify different sites of drug absorption	C1	LGIS	MCQ		
		Recall transport processes utilized by the drug for absorption across different sites	C1	LGIS	Meg		
		•					
M1-FM-	Factors affecting absorption	Enlist drug and body related factors affecting drug absorption	C1	LGIS	MCQ		
VI(Pharm)-004	of drugs	Briefly discuss different factors affecting drug absorption	C2	LOIS	MCQ		
M1-FM-	Distribution of drugs	Define distribution of drug	C1	LGIS	MCO		
VI(Pharm)-005	Distribution of drugs	Identify different body compartments	C1	LOIS	MCQ		
		Explain distribution of drug through various body compartments	C2				
		Enlist factors affecting distribution of drugs	C1				

	Community Medicine					
	Theory					
Code	Topic	Learning Objectives	Learning	Teaching	Assessment	
		At the end of the lecture the student should be able to	Domain	Strategy	Tool	
M1 EM VI(CM) 001	Health for All	Describe Man and medicine towards health for all	C1	LGIS	MCQS	
M11-FM1-V1(CM1)-001	M1-FM-VI(CM)-001 Health for All	Explain different eras of medicine	C1			
		Describe different systems of medicine	C1			
M1-2FM-VI(CM)-002	Genetics	Discuss Population Genetics	C1	LGIS	MCQS	
				PBL		

		Medicine							
	Theory								
Code	Topic	Learning Objectives	Learning	Teaching	Assessment				
		At the end of the lecture the student should be able to	Domain	Strategy	Tool				
M1-FM-VI(M)-001	Medicine	Define evidence-based Medicine	C1	I CIS	MCQs				
	Evidence based medicine	Discuss its applications.	C2	- LGIS	MCQs				
		Discuss components of EBM.	C2						
M1-FM-VI(M)-002	Bedside teaching	Explain how to take history of the patient and which steps to follow	C2	LGIS	MCQs				
M1-FM-VI(M)-003	General physical	Explain How to perform GPE	C2	LGIS	MCQs				
	examination	Discuss the importance of various signs	C2		MICQS				
		Discuss its correlation with systemic examination	C2						

		Surgery					
Theory							
Code	Topic	Learning Objectives	Learning	Teaching	Assessment		
		At the end of the lecture the student should be able to	Domain	Strategy	Tool		
	History taking & its	Enlist the components of a detail history	C1	LGIS	MCQs		
M1-FM-VI(S)-001	importance	Describe Importance of each component	C2	LOIS	MCQS		
		Describe the extension of breast	C1	LGIS	MCQs		
	_	Discuss different condition requiring breast surgery	C1		MCQs		
M1-FM-VI(S)-002	Breast surgery	Enlist steps involved in breast surgery	C1				
		Describe outcomes of breast surgery	C1				

	Obstetrics & Gynecology							
		Theory						
Code	Topic	Learning Objectives	Learning	Teaching	Assessment			
		At the end of the lecture the student should be able to	Domain	Strategy	Tool			
	Introduction to Fertilization,	 Understand the process of conception and implantation. 	C2	LGIS	MCQs			
M1-FM-VI(OBG)-001	Implantation,	Know the importance of embryogenesis	C2					
	embryogenesis, congenital abnormalities	Identify major structural abnormalities	C1					
		Understand the factors involved in fetal structural abnormalities	C2	LGIS	MCQs			

	Pediatrics Pediatrics								
Theory									
Code	Topic	Learning Objectives	Learning	Teaching	Assessment				
		At the end of the lecture the student should be able to	Domain	Strategy	Tool				
M1-FM-VI(Peads)-001	Medical Genetics & Dysmorphology	Describe the chromosomal abnormality and clinical features of trisomy 21	C2	LGIS	MCQs				

Spirally Integrated Courses / General Education Cluster (GEC) Courses

	The Holy Quran Translation Lecture							
	Theory							
Code	Topic	Learning Objectives	Learning	Teaching	Assessment			
		At the end of the lecture the student should be able to	Domain	Strategy	Tool			
M1-FM-SI(HQT)-001	Introduction to Quran Translation	Understand and apply ethical considerations in Quranic translation.	C2	LGIS	SAQ			
M1-FM-SI(HQT)-002	Islam and medical sciences	Co-relate Islamic concepts given in various verses of The Holy Quran with Medical Sciences	C2	LGIS	SAQ			

	Biomedical Ethics & Professionalism						
	Theory						
Code	Topic	Learning Objectives	Learning	Teaching	Assessment		
		At the end of the lecture the student should be able to	Domain	Strategy	Tool		
	Introduction to History	To appraise the historical perspective of Hippocratic oath	C2	I CIC	MGO		
M1-FM-SI(BE)-001	of Medical Ethics	Understanding the beginnings of contemporary bioethics to address ethical dilemmas	C2	LGIS	MCQs		

	Behavioral Sciences							
	Theory							
Code	Topic	Learning Objectives	Learning	Teaching	Assessment			
		At the end of the lecture the student should be able to	Domain	Strategy	Tool			
M1-FM-SI(BS)-001	Introduction to Behavioral Sciences	To describe Holistic and Traditional Allopathic medicine.	C1	LGIS	MCQs			
M1-FM-SI(BS)-001	Management of stress	Define the types of stress, its causes and management of stress	C1					

	Family Medicine							
		Theory						
Code	Topic	Learning Objectives	Learning	Teaching	Assessment			
		At the end of the lecture the student should be able to	Domain	Strategy	Tool			
M1-FM-SI(FMed)-001	Introduction to Family	Describe presenting complaints of patients with body aches						
W11-1 W1-51(1 Wicd)-001	Medicine & its application in	Discus complications of body aches		I GIG 1	1.600			
	health care system	Describe initial treatment of patients with body aches	C3	LGIS-1	MCQs			
		Know when to refer patient to consultant/ Hospital						

	Artificial Intelligence (Innovation)								
Theory									
Code	Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain	Teaching Strategy	Assessment Tool				
M1-FM-SI(AI)-001	Introduction to Artificial Intelligence	 Discuss fractures of upper limb with their clinical significance. Discuss role of artificial intelligence in interpretation of radiographs 	C2	LGIS	MCQS				

	Life Style and Prevention							
	Theory							
Code	Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain	Teaching Strategy	Assessment Tool			
M1-FM-SI(LS&P)-001	Healthy Lifestyle: A Foundation for Medical Professionals	 Understand the components of a healthy lifestyle. Recognize the challenges of maintaining a healthy lifestyle as medical students. Develop strategies to incorporate healthy habits into their routines. 	C2	LGIS	MCQS			

	Theory									
Code	Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain	Teaching Strategy	Assessmen Tool					
		Theoretical Lecture Based Teachings		<u> </u>	<u>I</u>					
		Define Community Medicine, public health, preventive medicine	C1							
		Differentiate Community medicine and preventive medicine	C2							
M1-FM-SI(IUGRC)-001	Introduction to Community	Elaborate evolution of preventive medicine/public health	C2							
	Medicine	Discuss role of public health in prevention of diseases	C2							
		Discuss importance of public health	C2							
		Define Health Research & Concept of Health research methods.	C1							
M1 FM GI/HICDC\ 002		Understand background and value of research in health & human development	C2							
M1-FM-SI(IUGRC)-002	Introduction to Health Research process and researcher	Elaborate Fundamental types and fields of health research covering;	C2							
	(Research-I)	- Basic & Applied Research	C2							
		- Quantitative & Qualitative Research								
		- Collaborative & Multidisciplinary research		LGIS-1	MCQs					
		- Health Research triangle								
		Conceptualize the drivers of research Including;	C2							
		- Curiosity								
		- Health needs								
		- Opportunity Profit								
		Describe meanings of HR & HRM								
		Appreciate role of HR in healthcare practices and human development	C2							

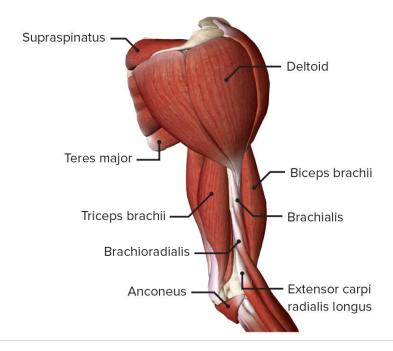
		Differentiate among various types and fields of HR	C2		
		Explain different drivers of HR	C2		
		 Explain meanings of various characteristics of health research process so as to 	C2		
		Differentiate research activity from non-research activity.	C2	LGIS-2	MCQs
M1-FM-SI(IUGRC)-003	Characteristics of research	Elaborate ingredients of researcher	C2		MCQs
	and health research methods (Research-II)	Appreciate the importance of commands in certain pre- requisite subjects & skills before undertaking a research study.	C2		
		Define Health Research	C1		
		Discuss the criteria for selection of a research topic	C2		
		Elaborate the types of variable	C2		
		Differentiate between qualitative and quantitative data	C2		
M1-FM-SI(IUGRC)-004	Basics of Ethics in Health	Appreciate value of ethics in conduct of Health Research.	C2		
M1-FM-SI(10GRC)-004	Research	Explain basic ethical principles of health research.	C2		
	(Research-III)	Interpret the application of data collection ethics	C2		
		Explain ethics of research methods	C2	LGIS-3	MCQs
	Basics of Ethics in Health	Narrate responsibility for ethics in HR.	C2		
M1-FM-SI(IUGRC)-005	Research (Research-IV)	 Explain Nuremburg code and importance of ethics in current research trends. 	C2		
	(Research-1v)	 Elaborate General ethical principles including explanation of 04 basic principles of Beneficence, non-maleficence, respect and justice 	C2		
M1-FM-SI(IUGRC)-006	Five steps of EBM	Discuss Five steps of EBM	C2	LGIS-3	MCQs

Entrepreneurship						
Theory						
Code	Topics	Brief Note	Learning Outcomes			
			Understand the concept of ideation in the entrepreneurial context.			
M1-FM-SI(E)-001	Ideate Initial Idea	How it would create value	Learn techniques for generating creative and innovative business ideas.			
			Develop skills to evaluate and refine initial ideas for feasibility and viability.			

Digital Literacy Module						
Theory						
Code	Topic	Learning Objectives	Teaching			
		At the end of the lecture the student should be able to Strate		Tool		
M1-FM-SI(DL)-001	RMU Goes digital	Introduction to LMS, CMS and MS Teams.	LGIS	MCO		
		Introduction to RMU website	LGIS	MCQs		
		How to use HEC digital library				
		How to use up to date website				

Block-I Module No. 2 – Musculoskeletal-I

Duration 5 Weeks



MSK-I Module Team

Module Name : MSK-I Module

Duration of module : 05 Weeks

Coordinator : Dr. Maria Tasleem

Co-coordinator : Dr. Gaiti Ara

Reviewed by : Module Committee

Module Committee			Module Task Force Team		
1.	Vice Chancellor RMU	Prof. Dr. Muhammad Umar	1.	Coordinator	Dr. Maria Tasleem (Assistant Professor of Anatomy)
2.	Chairperson Anatomy & Dean	Prof. Dr. Ayesha Yousaf	2.	DME Focal Person	Dr. Farzana Fatima
	Basic Sciences				
3.	Director DME	Prof. Dr. Ifra Saeed	3.	Co-coordinator	Dr. Gaiti Ara (Senior Demonstrator of Anatomy)
4.	Chairperson Physiology	Prof. Dr. Samia Sarwar	4.	Co-Coordinator	Dr. Fahd Anwar (Demonstrator of Physiology)
5.	Chairperson Biochemistry	Dr. Aneela Jamil	5.	Co-coordinator	Dr. Romessa Naeem (Demonstrator of Biochemistry)
6.	Focal Person Anatomy First Year				
	MBBS	Asso. Prof. Dr. Mohtashim Hina			
7.	Focal Person Physiology	Dr. Sidra Hamid		DM	IE Implementation Team
			1.	Director DME	Prof. Dr. Ifra Saeed
8.	Focal Person Biochemistry	Dr. Aneela Jamil	2.	Assistant Director DME	Dr. Farzana Fatima
9.	Focal Person Pharmacology	Dr. Zunera Hakim	3.	Implementation Incharge 1st & 2 nd	Prof. Dr. Ifra Saeed
				Year MBBS	Dr. Farzana Fatima
10.	Focal Person Pathology	Dr. Asiya Niazi	4.	Editor	Muhammad Arslan Aslam
11.	Focal Person Behavioral Sciences	Dr. Saadia Yasir			
12.	Focal Person Community Medicine	Dr. Afifa Kulsoom			
13.	Focal Person Quran Translation	Dr. Uzma Zafar			
	Lectures				
14.	Focal Person Family Medicine	Dr. Sadia Khan			

			The	emes			
Block	Module	General Anatomy	Embryology	Histology	Gross Anatomy		
	• Anatomy	Skeletal System	General Embryology Second Week of Human Development till Placenta & Fetal Membranes	General Histology Connective Tissue Cartilage Bone	Shoulder joint till Hand		
-	Biochemistry	Minerals, Vitamin		niamin and niacin), Introduct	ion & Classification of Amino Acids		
	• Physiology	 NMJ, Introduction Concept of Motor Unit. Neuromuscular Transmission, Synthesis & Fate of Acetylcholine Drugs Acting On NMJ, Myasthenia Gravis, Lambart Eaton Syndrome Structure of Neurons. Classification of Neurons & Nerve Fibers Nernst Potential, RMP Recording & Propagation of Action Potential & Factors Effecting Nerve Conduction & Hyperpolarized State Stimulus & Response & Types of Stimuli, Stages of Action Potential 					
-	Spiral Courses						
ī	The Holy Quran Translation	• Imaniat					
1	Seerat Mubarak	The Significance of Seerah Studies					
	• Bioethics & Professionalism	Islamic concept of Bioethics					
	Research Club Activity	Comprehend their	role in under "theme and s	cheme"			
	Family Medicine	Approach to a pat	ient with Body aches				
	Artificial Intelligence/Radiology	• Interpretation of u	ipper limb Radiograph & us	se of AI			
•	Vertical components	The Holy Quran 7	Translation Component				
	Vertical Integration						
	Clinically content relevant to musculoskeletal-I module Shoulder Dislocation (Surgery) Tennis elbow, Fracture of olecranon, Radius and Ulna (Surgery) Osteoporosis (Medicine) Osteomalacia, Rickets & Polyarthritis (Medicine) Accidents (Community Medicine)						
	· •			ll Exposure (ECE)			
	•	How to Read Bone X-	ray.				

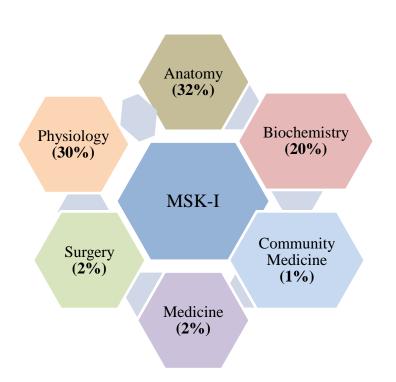
	How to find Bone age					
Clinical Rotations	Fractures of distal Bones					
	Placental abnormalities					
	Uterine abnormalities					
	Pregnancy and effects of congenital uterine abnormalities					
	X-ray in pediatric age group					
	Pathologies like Rickets, congenital dislocation of hip joint and other abnormalities					
	Clinical Relevance					
Accidents						

- Osteoporosis
- Understanding congenital skeletal abnormalities (e.g., clubfoot, spina bifida)
- Role of biomechanics in orthopedic injuries (e.g., sports injuries)
 Clinical application of bone physiology in osteoporosis and rickets
- Basics of fracture management and prevention strategies

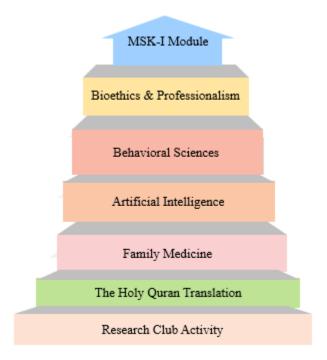
Implementation of Terms of Reference (TORS)

- Total hours of teaching, learning and formative/summative internal assessment to be completed in a year are predefined as per the guidelines of PMDC and to be strictly followed.
- The hours mentioned within each module are the mandatory minimum required.
- The content and the intended learning outcomes written are mandatory, to be taught, at the level required, as the end year assessment will be based on these. However, the level of cognition can be kept at a higher level.
- The Table of Specifications provided will be used for the three papers of the first professional examination.
- The same table of specifications should be used for the respective block exams for internal assessment.
- The criteria defined for continuous internal assessment is to be followed for each module and block respectively

Integration of Disciplines in Musculoskeletal-I Module



Spiral / General Education Cluster Courses (13%)



Module No. 2 – MSK-I

Rationale: This module deals with locomotor system. This module describes the structural organization, functions, and congenital anomalies of musculoskeletal system. It explains the mechanism of neuromuscular transmission, its biochemical basis and the importance of Ca++ in the body. It depicts structure and function of joints in upper and lower limb. It elaborates identification of common fractures of long bones on radiograph.

Module Outcomes

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

Knowledge

- Explain the development & structure of musculoskeletal system.
- Explain the physiological and biochemical factors affecting Neuro Muscular transmission.
- Apply the knowledge of the basic sciences to understand common fractures.
- Appreciate concepts & importance of

Artificial Intelligence

Family Medicine

Biomedical Ethics

Research.

Skills

- Dissect limbs to demonstrate regional Anatomy and relationships of various structures to each other.
- Identify histological features of connective tissue and muscles under microscope.
- Perform practicals on estimation of calcium and protein chemistry.

Attitude

• Demonstrate a professional attitude, team building spirit, good communication skills and cadaveric handling.

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



Syllabus of Musculoskeletal-I (Module No. 2)

		Anatomy			
		Theory			
Code	Topic	Learning Objectives	C/P/A	Teaching	Assessment
		At the end of session students should be able to		Strategy	Tool
		Embryology		Teaching Strategy LGIS LGIS	I
		Describe formation of Amniotic Cavity, embryonic disc and Umbilical vesicle	C2		
		Discuss development of chorionic sac	C2		SAOs
M2-MSK-I-A-001	Formation of Bilaminar	Outline the process of implantation	C1		SAQs MCQs VIVA VOCE
	Embryonic Disc (2 nd week of Human Development)	Describe changes in Gravid Endometrium	C2	LGIS	
		Understand the Bio-physiological aspects of gravid endometrium	C2		
		Corelate with the clinical conditions	C3		
		focus on provision of curative and preventive health care measures	C3		
		Practice principles of bioethics	C3		
		Apply strategic use of AI in health care	C3		
		read relevant research article	C3		
		Discuss process of gastrulation with special reference to primitive streak	C2		
		Describe the fate of primitive streak	C2		
		Discuss establishment of body axis	C2		SAQs
M2-MSK-I-A-002	Gastrulation	Draw fate map and discuss its importance in future development	C2		MCQs
	Establishment of Body Axis	Understand the Biophysiological aspects of gastrulation	C2	LGIS	VIVA VOCE
	Establishment of Body Axis and Fate Map (3 rd week)	Describe congenital abnormalities associated with gastrulation	C3		
		Corelate with the clinical conditions	C3		
		focus on provision of curative and preventive health care measures	C3		
		Practice principles of bioethics	C3		
			C3	1	

		Apply strategic use of AI in health care	C3		
		Read a relevant Research article			
		Define notochord	C1	LGIS	
		Delineate different stages of notochord formation	C1	-	
M2-MSK-I-A-003	Notochard Formation	Discuss the importance of notochord in development of central nervous system	C2	LGIS	SAQs MCQs
		Describe role of notochord in development of axial Skeleton	C1	-	VIVA VOCE
		Describe the fate of notochord	C2	-	VIVA VOCE
	(3 rd week)	Correlate with clinical conditions of notochord formation	C3	-	
		 focus on provision of curative and preventive health care measures 	C3	-	
		Practice principles of bioethics	C3		
		Apply strategic use of AI in health care	C3		
		read relevant research article	C3		
	 Define neurulation Describe formation of neural plate and neural tube Discuss neural crest formation 	Define neurulation	C1		
		-	SAQs		
		Discuss neural crest formation	C2		MCQs
		Enlist derivatives of neural crest cells	C1		VIVA VOCE
M2-MSK-I-A-004	Neurulation	Understand the bio-physiological aspects of Neurulation	C2		
WIZ WISIK I II 004		Discuss neural tube defects	C3	LGIS	
	(5 5)	Discuss different types of spina bifida	C3	-	
	Notochord Formation (3rd week) (4rd week) (5rd week) (5rd week) (6rd week) (7rd week) (8rd week) (9rd week) (9rd week) (1rd week) (1rd week) (1rd week) (2rd week) (3rd week) (4rd week) (5rd week) (6rd week) (7rd week) (8rd week) (9rd week) (9rd week) (1rd week) (9rd week) (1rd week) (1rd week) (1rd week) (1rd week) (1rd week) (1rd week) (2rd week) (3rd week) (4rd week) (5rd week) (6rd week) (7rd week) (8rd week) (9rd week) (9rd week) (9rd week) (1rd week	Discuss the importance of folic acid in the prevention of spina bifida	C2	-	
		Corelate with the clinical conditions	C3	C1	
		focus on provision of curative and preventive health care measures	C3	-	
		Practice principles of bioethics	C3		
		Apply strategic use of AI in health care	C3		
					ļ

	• rea	ad relevant research article	C3		
,		Enumerate three germ layers and their derivatives	C1		
		Describe different divisions of mesoderm	C2		SAQs
162 1637 I 1 005		Describe development of somites and their differentiation	C2		MCQs
M2-MSK-I-A-005	Development and	Explain different stages of somite development	C2	LGIS	VIVA VOCE
	Differentiation of Somites	Understand the Biophysiological aspects of Somite differentiation Complete division and the first differentiation Complete differentiation Complete differentiation Complete differentiation	C2 C3	Lois	
		Correlate clinical aspects of somite differentiation		<u> </u>	
		• Focus on provision of curative and preventive health care measures	C3		
		Practice principles of bioethics	C3		
		•Apply strategic use of AI in health care	C3		
		Read relevant research article	C3		
		Describe early development of cardiovascular system and chorionic villi	C2		
		Discuss development of intraembryonic coelom	C2		SAQs
		Define angiogenesis and vasculogenesis.	C 1		MCQs
	Early Development of Cardiovascular System &	Correlate clinical aspects of angiogenesis	C3	LGIS	VIVA
M2-MSK-I-A-006		• Summarize the main developmental events and changes in external form of the embryo during the 4th to 8th weeks	C2		
	highlights of 4th-8th week	Corelate with the clinical conditions	C3		
		focus on provision of curative and preventive health care measures	C3		
		Practice principles of bioethics	C3		
		Apply strategic use of AI in health care	C3		
		read relevant research article	C3		
		Enlist different phases of embryonic development	C1		
		Describe folding of the embryo in median plane	C2		
		Describe folding of the embryo in horizontal plane	C2		
		Discuss results of folding	C2	I GIG	
M2-MSK-I-A-007	Folding of Embryo	Discuss Omphalocele and Gastroschisis	C3	LGIS	SAQs
		Corelate with the clinical conditions	C3		MCQs
		focus on provision of curative and preventive health care measures	C3		VIVA VOCE
		Practice principles of bioethics	C3	1	
		Apply strategic use of AI in health care	C3]	
		read relevant research article	C3	1	
M2-MSK-I-A-008	Fetal period	Describe different criteria for fetal age estimation	C2		

		Discuss the trimesters of pregnancy with their importance	C2		
		Discuss the trimesters of pregnancy with their importance Describe highlights of fetal period	C2		CAO.
		Describe highlights of letal period Differentiate between embryonic and fetal period	C2		SAQs
		· · · · · · · · · · · · · · · · · · ·	C2		MCQs
		Tabulate growth in length and weight during fetal period Tabulate growth in length and weight during fetal period			VIVA VOCE
		Enumerate and discuss factors influencing fetal growth	C2	LGIS	
		Define the term perinatology	C1		
		Enlist and briefly describe procedures for assessing fetal well-being	C3		
		Correlate clinical aspects of fetal period	C3		
		focus on provision of curative and preventive health care measures	C3		
		Practice principles of bioethics	C3		
		Apply strategic use of AI in health care	C3		
		read relevant research article	C3		
		Discuss Implantation and establishment of the embryo within the uterus	C2		
		Describe the differentiation of the uterine lining into decidua	C2	LGIS	SAQs
		Describe the development of a placenta	C2	LGIS	MCQs
M2-MSK-I-A-009	Placenta	Describe fetal – maternal circulation	C2		VIVA VOCE
		Discuss the bio-physiological aspects of placenta	C2		
		Corelate the clinical conditions associated with placenta	C3		
		focus on provision of curative and preventive health care measures	C3		
		Practice principles of bioethics	C3		
		Apply strategic use of AI in health care	C3		
		read relevant research article	C3		
		Enlist membranes developing during pregnancy	C1		
		Discuss origin, composition, location, function and fate of yolk sac	C2		
	Fetal Membranes and	Explain origin, composition, location, function and fate of Amnion	C2	LGIS	SAQs
	Multiple Pregnancies	Describe formation of umbilical cord and its structure	C2		MCQs
M2-MSK-I-A-0010	ividitiple i regnancies	Define Allantois along with its importance and function	C1		VIVA VOCE
		Discuss different types of twins	C2		
		Correlate clinical aspects of fetal membranes	C3		
		Correlate with the clinical conditions of twin pregnancy	C3		
		 focus on provision of curative and preventive health care measures 	C3		
		Practice principles of bioethics	C3		
		Apply strategic use of AI in health care	C3		

		read relevant research article	C3		
		Histology	<u> </u>	1	
		Define connective tissue	C1		
		Classify connective tissue	C2		
	Connective tissue I	Enlist and explain types of cells in CT	C2		
M2-MSK-I-A-0011	Cells of connective tissue	Enumerate sites and describe the function of each type of cell of connective tissue	C2	LGIS	SAQs MCQs
	Embryonic connective tissue / mucoid Connective Tissue	Understand the Biophysiological aspects of connective tissue	C2		VIVA VOCE
	/ inucold Connective Tissue	Draw and label histological structure of mucoid CT.	C2		
		Describe fibers in mucoid CT	C2		
		Correlate clinical conditions of CT	C3		
		focus on provision of curative and preventive health care measures	C3		
		Practice principles of bioethics	C3		
		Apply strategic use of AI in health care	C3		
		read relevant research articles	C3		
		Enumerate examples and location of reticular, connective tissue	C1		SAQs
M2-MSK-I-A-0012	Connective tissue II	Illustrate histological structure of loose and reticular connective	C2	LGIS	MCQs
1112 11211 1 1 1 0 0 1 2	Loose aerolar connective	Correlate clinical aspects of loose and reticular CT	C3		VIVA VOCE
	tissue & its types	• focus on provision of curative and preventive health care	C3		
	Reticular CT	Practice principles of bioethics	C3		
		Apply strategic use of AI in health care	C3		
		• read relevant research article	C3		
		Enumerate examples and location of adipose and dense CT.	C1		
M2-MSK-I-A-0013	Connective tissue III	 Draw, describe and label histological structure of all types of connective tissue. 	C2	LGIS	SAQs
	Adipose CT Dense regular and irregular	Differentiate between dense regular and irregular connective tissue microscopically	C2		MCQs VIVA VOCE
	connective	Correlate clinical aspects of loose and reticular CT	C3	=	
		focus on provision of curative and preventive health care	C3		
		Practice principles of bioethics	C3		
		Apply strategic use of AI in health care	C3		
		read relevant research article	C3	7	
M2-MSK-I-A-0014	Cartilage	Classify cartilage	C2		

		Enlist sites of hyaline, fibro and elastic cartilage	C1		
		Appreciate microscopic structure of Hyaline, Elastic and Fibrocartilage	C2	1	
		Differentiate between three cartilages	C2	LGIS	SAQs
		Describe the structure of perichondrium	C2	1	MCQs
		Describe the arrangement of layers in articular cartilage	C2		VIVA VOCE
		Understand the Biophysiological aspects of cartilage	C2		
		Correlate with clinical conditions	C3	1	
		focus on provision of curative and preventive health care		1	
		Practice principles of bioethics	C3	1	
		Apply strategic use of AI in health care	C3		
		read relevant research article	C3		
		 Describe structure and functions of bone cells 	C2		
		Discuss periosteum and endosteum	C2		
	Bone-I (Cells & Types)	• Discuss types of bones	C2	LGIS	SAQs MCQs
		 Describe the histological features of spongy and compact bone 	C2		
M2-MSK-I-A-0015		• Describe structure of osteon.	C2		
		Understand the Biophysiological aspects of bone	C2		VIVA VOCE
		Correlate clinical aspects of bone	C3		
		focus on provision of curative and preventive health care	C3		
		Practice principles of bioethics	C3		
		Apply strategic use of AI in health care	C3		
		read relevant research article	C3		
		Describe osteogenesis	C2	I CIG	SAQs
		Discuss bone growth, remodeling and repair	C2	LGIS	MCQs VIVA VOCE
		Describe histological changes in bones in osteoporosis, rickets,	C3		VIVA VOCE
M2-MSK-I-A-0016	Bone-II	osteomalacia, osteopetrosis and bone tumors	GO	_	
	(Ossification)	Correlate with the clinical conditions.	C3		
	(=)	• focus on provision of curative and preventive health care measures	C3		
		Practice principles of bioethics	C3		
		Apply strategic use of AI in health care	C3	1	
		• read relevant research article	C3		

		General Anatomy			
		Describe the functions of bone and skeleton	C2		
		Identify general features of bone	C2		SAQs
	Bone-I	Differentiate between maceration and decalcification of bones	C2	LGIS	MCQs
M2-MSK-I-A-0017	(General Features)	Correlate with clinical conditions of bone	C3		VIVA VOCE
	,	focus on provision of curative and preventive health	C3		
		Practice principles of bioethics	C3		
		Apply strategic use of AI in health care	C3		
		read relevant research article	C3		
		Classify bones based on different criteria	C2		
		Describe the growing end hypothesis	C2	LGIS	SAQs
		Describe blood supply of bones	C2		MCQs
M2-MSK-I-A-0018	Bone-II Classification & Blood supply)	 Appreciate role of bones in estimation of sex, age and stature. 	C2		VIVA VOCE
		Correlate with the clinical conditions.	C3		
		focus on provision of curative and preventive health care measures	C3		
		Practice principles of bioethics	C3		
		Apply strategic use of AI in health care	C3		
		read relevant research article	C3		
		Define joints	C1	LGIS	
		Classify fibrous joints with examples	C2		SAQs
		Classify cartilaginous joints with examples	C2		MCQs
		Classify synovial joints with examples	C2		VIVA VOCE
M2-MSK-I-A-0019	Joints-I	Understand the Bio-physiological aspects of joints	C2		
	(Types)	Correlate with the clinical conditions	C3		
		• focus on provision of curative and preventive health care measures	C3		
		Practice principles of bioethics	C3		
		Apply strategic use of AI in health care	C3		
		read relevant research article	C3		
	Joints-II	Describe structure of synovial joint	C2		
M2-MSK-I-A-0020	(Movements)	Classify synovial joints	C2	LGIS	SAQs
	(Wovements)	Explain movements around synovial joints	C2		

Enlist Degenerative joint diseases	C3		MCQs
Describe the involvement of anatomical structure of the articular cartilage in Degenerative joint disease	СЗ		VIVA VOCE
Correlate with the clinical conditions.	C3]	
focus on provision of curative and preventive health care	C3]	
Practice principles of bioethics	C3		
Apply strategic use of AI in health care	C3		
read relevant research article	C3		

Code	Topic	Learning Objectives	C/P/A	Teaching	Assessment Tool
		At the end of Session students should be able to		Strategy	
		• Classify the joint (according to type, shape and movement)	C2		
		Discuss the attachments of capsule and ligament	C2		
		• Enlist the intra-articular structure (tendon of biceps brachii)	C1		
		• Describe attachment of glenoidal labrum with its significance in relation to synovial	C2		
		membrane			MCQs
		Discuss the neurovascular supply	C2		SEQs
		• Discuss factors indispensable for stability of joint	C2	SGD,	VIVA VOCE
M2-MSK-I-A-0021	Shoulder Joint	Discuss the movements at shoulder joint	C2	Skill Lab	OSPE
		• Enlist related bursae.	C1		
		• Explain the related clinicals (shoulder dislocation, rotator cuff injuries, Glenoid Labrum tears, Frozen shoulder)	C3		
		Correlate with the clinical conditions	C3	7	
		• focus on provision of curative and preventive health care measures	C3		
		Practice principles of bioethics	C3		
		Apply strategic use of AI in health care	C3		
		• Tabulate muscles of flexor compartment with their origin, insertion, nerve supply and actions	C2		
		Describe Neurovascular organization of arm.	C2		
M2-MSK-I-A-0022	Flexor compartment	Map the outline of Brachial artery and Musculo cutaneous nerve in a simulated patient or model	P	SGD,	MCQs SEQs
	&	• Correlate with the clinical conditions (biceps tendinitis, dislocation of tendon of biceps brachii)	C3	SGD, Skill Lab	VIVA VOCE

	Neurovascular	• focus on provision of curative and preventive health care measures	C3		OSPE
	organization of	Practice principles of bioethics	C3		
	the arm	Apply strategic use of AI in health care	C3	1	
		Read a relevant research article	C3	1	
M2-MSK-I-A-0023		• Tabulate Muscles of extensor compartment with origin insertion, nerve supply and actions	C2		
		Describe the neurovascular organization	C2		MCQs
		• Discuss consequences of injury to radial nerve (wrist drop), venipuncture in cubital fossa)	C3	SGD,	SEQs
	Entonoon	Map the outline of Radial nerve and ulnar nerve on a simulated patient or model	P	- Skill Lab	VIVA VOCE OSPE
	Extensor	Correlate with the clinical conditions	C3		OSPE
	compartment of the arm	• focus on provision of curative and preventive health care measures	C3		
	0- 1-17 11-11	Practice principles of bioethics	C3		
		Apply strategic use of AI in health care	C3		
		Read relevant research article	C3		
	Ulna	Determine the side	C1		MCQs SEQs VIVA VOCE OSPE
		Demonstrate anatomical position	P	1	
		Discuss general features, attachments and articulations	C2	SGD, Skill Lab	
		Describe ossification	C2		
		Elaborate interosseous membrane and its importance	C2		
M2-MSK-I-A-0024		Correlate with the clinical conditions	C3		
		 focus on provision of curative and preventive health care measures 	C3		
		Practice principles of bioethics	C3		
		Apply strategic use of AI in health care	C3		
		Read a relevant research article	C3		
		• Determine the side	C1		
		Demonstrate its anatomical position	P		
		Discuss general features, attachments and articulations	C2	SGD,	MCQs
	D 1'	Describe its ossification	C2	Skill Lab	SEQs
M2-MSK-I-A-0025	Radius	Describe the interosseous membrane and its importance	C2		VIVA VOCE
		Correlate the clinical conditions	C3	1	OSPE
		• focus on provision of curative and preventive health care measures	C3	_	
		Practice principles of bioethics	C3	_	
		 Apply strategic use of AI in health care 	C3		

		Read a relevant research article	C3		
		• Tabulate muscles of flexor compartment with their origin, insertion, nerve supply and	C2		
		actions			MCQs SEQs VIVA VOCE OSPE
		Correlate with clinical conditions associated with flexor compartment	C3	SGD,	
M2-MSK-I-A-0026	Flexor compartment	• Map the outline of Median Nerve, Radial Artery and Ulnar Artery of forearm in a simulated patient or Model	P	Skill Lab	
WIZ-WISK-I-A-0020	of the forearm	focus on provision of curative and preventive health care measures	C3		OSIL
	of the forearm	Practice principles of bioethics	C3		
		Apply strategic use of AI in health care	C3		
		Read a relevant research article	C3		
	Extensor	• Tabulate muscles of extensor compartment with origin, insertion, nerve supply and actions	C2	SGD,	
M2-MSK-I-A-0027	compartment of the forearm	• Correlate with clinical conditions associated with extensor compartment of forearm (Tennis elbow)	C3	Skill Lab	MCQs SEQs
W12-W151X-1-A-0027	of the forearm	focus on provision of curative and preventive health care measures	C3		VIVA VOCE
		Practice principles of bioethics	C3		OSPE
		Apply strategic use of AI in health care	C3		OSIL
		Read a relevant research article	C3		
	Neurovascular	• Describe nerves and vessels of forearm (formation, commencement, course, branches and relations)	C2		MCQs SEQs VIVA VOCE OSPE
		• Correlate with associated clinical conditions (Median nerve injury, pronator syndrome, cubital tunnel syndrome)	C3	SGD, SKILL	
		Map the outline of Radial Nerve and Ulnar Nerve on a simulated patient or model	P	LAB	
M2-MSK-I-A-0028	organization	Correlate with the clinical conditions	C3		
	of forearm	• focus on provision of curative and preventive health care measures	C3		
		Practice principles of bioethics	C3		
		Apply strategic use of AI in health care	C3		
		Read relevant research article	C3		
		Describe the type of joint with its articular surfaces	C2		
		Discuss the capsule, synovial membrane and ligaments of the joints	C2		MCQs
	Elbow joint	• Enumerate the related bursae,	C1	SGD,	SEQs
	J - 2	Describe axis and plane of movements	C2	SKILL	VIVA VOCE
M2-MSK-I-A-0029		Enumerate muscles producing movements at elbow joint.	C1	LAB	OSPE
		Correlate with the associated clinical conditions (Elbow joint dislocation and student's elbow)	СЗ		
		focus on provision of curative and preventive health care measures	C3	- 	

		Practice principles of bioethics	C3		
		Apply strategic use of AI in health care			
		Read a relevant research article	C3		
	Proximal and	 Describe type of radioulnar joints, articular surfaces, capsular attachments, synovial membrane and ligaments. 	C2	SGD,	MCQs SEQs
	distal	Describe movements of supination and pronation with special reference to axes	C2	SKILL	VIVA VOCE
M2-MSK-I-A-0030	radioulnar	Enumerate the muscles producing these movements	C1	LAB	OSPE
1112 111211 1 1 1 0 0 0 0	joints	Correlate clinical aspects of joint	C3		0212
	Joines	• focus on provision of curative and preventive health care measures	C3		
		Practice principles of bioethics	C3		
		Apply strategic use of AI in health care	C3		
		Read a relevant research article	C3	1	
		• Understand the arrangement of carpal bones	C1		
		 Identify the salient features of carpel bone. 	C2	SGD,	MCQs SEQs VIVA VOCE OSPE
		 Discuss the special blood supply of scaphoid bone. 	C3		
	Hand	Describe the mid carpal joint.	C2		
		Discuss the 1st carpometacarpal joint including the type of the joint capsule synovial	C2	SKILL	
M2-MSK-I-A-0031		membrane and ligaments with axis of the movement and the muscles producing the		LAB	
1/12 1/1611 1 11 0051		movements			OSIL
		• Correlate with the clinical conditions.	C3		
		 focus on provision of curative and preventive health care measures 	C3		
		Practice principles of bioethics	C3		
		 Apply strategic use of AI in health care 			
		Read relevant research article	C3		
		Describe the type of joint with its articular surfaces	C2		
		Discuss the capsule, synovial membrane and ligaments of the joint	C2		
		Enumerate the related bursae	C1		MCQs
		Describe axis and plane of movements	C2	SGD,	SEQs
M2-MSK-I-A-0032	Wrist joint	Enumerate muscles producing movements at joint	C1	SKILL	VIVA VOCE
W12-W13K-1-A-0032		• Discuss wrist fractures & Dislocations	C3	LAB	OSPE
		Correlate with the clinical conditions	C3		
		focus on provision of curative and preventive health care measures	C3		
		Practice principles of bioethics	C3	7	
		Apply strategic use of AI in health care	C3		
		Read a relevant research article	7		
		• Discuss the blood vessels involved in the formation of anastomosis around the wrist	C2		
		joint			

	Anastomosis	Explain the importance of anastomosis.	C2		
M2-MSK-I-A-0033	around wrist	Correlate with the clinical conditions	C3		MCQs
	joint	• focus on provision of curative and preventive health care measures Able to focus on	C3	SGD,	SEQs
	3	provision of curative and preventive health care measures		SKILL	VIVA VOCE
		Practice principles of bioethics	C3	LAB	OSPE
		Apply strategic use of AI in health care	C3		
		Read a relevant research article			
		Describe the muscles of dorsum of hand	C2	SGD,	
		Discuss the Dorsal digital expansion	C2	SKILL	MCQs
		Describe the attachment of flexor retinaculum with structures related to it.	C2	LAB	SEQs
		• Map the outline of flexor and extensor retinacula on a simulated patient or a model.	P		VIVA VOCE
	Dorsum of	Describe the Guyon's canal.	C2		OSPE
M2-MSK-I-A-0034	Hand, Flexor	Describe the formation of the carpel tunnel and its applied anatomy.	C3]	
	retinaculum	Describe the attachment of extensor retinaculum and its various compartments with	C2]	
	Extensor	structures passing through it.			
	retinaculum	Discuss the De Quervain's disease.	C3		
		Correlate with the clinical conditions.	C3]	
		• focus on provision of curative and preventive health care measures	C3]	
		Practice principles of bioethics	C3		
		Apply strategic use of AI in health care			
		Read a relevant research article	C3]	
		Tabulate the muscles forming the thenar and hypothenar eminence.	C2		
		Discuss Lumbricals, Palmar and dorsal interossei with their attachments and	C2		
		actions.			MCQs
	Palm of hand-	Discuss the formation of superficial and deep arterial arches	C2	SGD,	SEQs
	I	Map the outline of superficial and deep arterial arches on a simulated patient or	P	SKILL	VIVA VOCE
M2-MSK-I-A-0035	Muscles &	model.		LAB	OSPE
W12-WISK-1-A-0033	Neurovascular	Correlate with the clinical conditions.	C3	1	
	organization	• focus on provision of curative and preventive health care measures	C3		
		Practice principles of bioethics	C3		
		Apply strategic use of AI in health care	C3	-	
		Read a relevant research article	C3	_	
	Palm of hand-	Discuss the formation and attachments of palmar aponeurosis.	C2	+	
	II Fascial	Describe the formation of palmar spaces and its divisions	C2		
M2-MSK-I-A-0036	spaces of hand	Describe the formation of paintar spaces and its divisions Describe the thenar and mid palmar spaces.	C2		MCQs
1V12-1V191X-1-A-UU30	spaces of fialid	 Describe the thenar and find parmar spaces. Define pulp spaces 	C1		MCQS
		- Define purp spaces	CI		

	Grip	Relate anatomy of pulp space with its common clinical conditions	C3	SGD,	SEQs
		Describe dorsal subcutaneous spaces	C2	SKILL	VIVA VOCE
		Demonstrate surgical incisions.	C3	LAB	OSPE
		Describe different types of grips	C2		
		Correlate with the clinical conditions.	C3]	
		focus on provision of curative and preventive health care measures	C3		
		Practice principles of bioethics	C3		
		Apply strategic use of AI in health care	C3		
		Read a relevant research article	C3		
		• Identify the structures present at different levels of cross section; mid humeral shaft, end of	C2		
	Cross	humeral shaft, elbow joint, superior radioulnar joint, mid forearm, wrist joint, proximal			
	sectional	shafts of metacarpals.		SGD,	MCQs
M2-MSK-I-A-0037	Anatomy of	Correlate with the clinical conditions	C3	SKILL	SEQs
	upper limb	Read a relevant research article	C3	LAB	VIVA VOCE
		Apply strategic use of AI in health care	C3		OSPE

Topic	Learning Objectives	Learning Resources
	At the end of Session students should be able to	
	• Classify the joint (according to type, shape and movement)	
	Discuss the attachments of capsule and ligament	
	• Enlistt heintra-articular structure (tendon of biceps brachii)	
	Describe attachment of glenoidal labrum with its significance in relation to synovial	 Clinical Oriented Anatomy by Keith
Shoulder Joint	membrane	L. Moore.8 TH Edition. (Chapter 3,
	11 7	Page 266- 271,284-285).
	Discuss factors indispensable for stability of joint	https://teachmeanatomy.info/upper-
	Discuss the movement sat shoulder joint	limb/joints/shoulder
	Enlist related bursae.	
	• Explain the related clinicals (shoulder dislocation, rotator cuff injuries, Glenoid Labrum tears, Frozen shoulder)	
	• Tabulate muscles of flexor compartment with the irorigin, insertion, nerve supply and actions	
Flexor	Describe Neurovascular organization of arm,	Clinical Oriented Anatomy by Keith
compartment	• Explain the related clinicals (biceps tendinitis, dislocation of tendon of biceps brachii)	L. Moore.8 TH Edition. (Chapter 3,
& Neurovascular		Page201-211,211-214).
organization of		https://teachmeanatomy.info/upper-
the arm		limb/muscles/anterior-forearm/
	Flexor compartment & Neurovascular organization of	Shoulder Joint Shoulder Joint

M2-MSK-I-A-0040 M2-MSK-I-A-0041	Extensor compartment of the arm Ulna	 Tabulate Muscles of extends or compartment with origin insertion, nerve supply and actions Describe the neurovascular organization Discuss consequences of injury to radial nerve (wrist drop), venipuncture in cubital fossa) Read relevant research article Use Digital Library Determine the side Demonstrate anatomical position Discuss general features, attachment sand articulations Describe ossification Elaborate interosseous membrane and its importance Correlate the clinical aspects 	 Clinical Oriented Anatomy by Keith L. Moore.8THEdition. (Chapter 3, Page201-211,211-214). https://teachmeanatomy.info/upper-limb/muscles/upper-arm/ Clinical Oriented Anatomy by Keith L. Moore.8THEdition. (Chapter 3, Page147). https://teachmeanatomy.info/upper-limb/bones/ulna/
M2-MSK-I-A-0042	Radius	 Determine the side Demonstrate it anatomical position Discuss general features, attachments and articulations Describe its ossification Describe the interosseous membrane and its importance Correlate the clinical aspects 	Clinical Oriented Anatomy by Keith L. Moore.8 TH Edition. (Chapter 3,
M2-MSK-I-A-0043	Flexor compartment of the forearm	 Tabulate muscles of flexor compartment with their origin, insertion, nerves Supply and actions Describe clinical conditions associated with flexor compartment 	Clinical Oriented Anatomy by Keith L. Moore.8 TH Edition. (Chapter 3,
M2-MSK-I-A-0044	Extensor compartment of the forearm	 Tabulate muscles of extensor compartment with origin, insertion, nerve supply and actions Describe clinical condition associated with extensor compartment of forearm (Tennis elbow) 	Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 3,

M2-MSK-I-A-0043	Neurovascular organization of forearm	 Describe nerves and vessels of forearm (formation, commencement, course, branches and relations) Describe associated clinical conditions (Median nerve injury, pronator syndrome, cubital tunnel syndrome) 	• Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 3, Page215-234,236,240).
		Read relevant research article Use Digital Library	https://teachmeanatomy.info/upper-limb/muscles/posterior-forearm/
M2-MSK-I-A-0044	Elbow joint	 Describe the type of joint with its articular surfaces Discuss the capsule, synovial membrane and ligaments of the joints Enumerate the related bursae, Describe axis and plane of movements Enumerate muscles producing movements at elbow joint. Describe the associated clinical conditions (Elbow joint dislocation and student's elbow) 	Clinical Oriented Anatomy by Keith L. Moore.8TH Edition (Chapter 3,
		 Describe type of radioulnar joints, articular surfaces, capsular attachments, synovial membrane and ligaments. Describe movements of supination and pronation with special reference to axes 	• Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 3, Page274-277).
M2-MSK-I-A-0045	Proximal and distal radioulnar joints	• Enumerate the muscles producing these movements	https://www.kenhub.com/en/library/a natomy/proximal-radioulnar-joint
		Correlate clinical aspects of joint	https://www.kenhub.com/en/library/a natomy/distal-radioulnar-joint
Mo Mov I A 2046	Hand	 Understand the arrangement of carpal bones Identify the salient features of carpel bone. Discuss the special blood supply of scaphoid bone. Describe the midcarpal joint. Discuss the 1st carpometacarpal joint including the type of the joint capsules ynovial 	Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. Chapter 3, Page148-151,278-283).
M2-MSK-I-A-0046		Membrane and ligaments with axis of the movement and the muscles producing the movements • Read relevant research article • Use Digital Library	https://teachmeanatomy.info/upper- limb/muscles/hand/
M2-MSK-I-A-0047	Wrist joint	 Describe the type of joint with its articular surfaces Discuss the capsule, synovial membrane and ligaments of the joint Enumerate the related bursae Describe axis and plane of movements 	• Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 3, Page278).

		Enumerate muscles producing movements at joint	https://www.kenhub.com/en/library/a
		Discuss wrist fractures & Dislocations	natomy/the-wrist-joint
M2-MSK-I-A-0048	Anastomosis around wrist joint	 Discuss the blood vessels involved in the formation of anastomosis around the wrist joint Explain the importance of anastomosis. 	Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 3,
M2-MSK-I-A-0049	Dorsum of Hand, Flexor retinaculum Extensor retinaculum	 Describe the muscles of dorsum of hand Discuss the Dorsal digital expansion Describe the attachment of flexor retinaculum with structures related to it. Describe the Guyon's canal. Describe the formation of the carpel tunnel and its applied anatomy. Describe the attachment of extensor retinaculum and its various compartments with structures passing through it. Discuss the De Quervain's disease. 	Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 3, Page159,224-226). https://teachmeanatomy.info/upper-limb/muscles/hand/
M2-MSK-I-A-0050	Palm of hand-I Muscles & Neurovascular organization	 Tabulate the muscles forming the thenar and hypothenar eminence. Discuss Lumbricals, Palmar and dorsal interossei with their attachments and actions. Discuss the formation of superficial and deep arterial arches Discuss the clinicals associated with palm 	Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 3, Pag243-256). https://teachmeanatomy.info/upper-limb/muscles/hand/
M2-MSK-I-A-0051	Palm of hand-II Fascial spaces of hand Grip	 Discuss the formation and attachments of palmar aponeurosis. Describe the formation of palmar spaces and its divisions Describe the thenar and mid palmar spaces. Define pulp spaces Relate anatomy of pulp space with its common clinical conditions Describe dorsal subcutaneous spaces. Demonstrate surgical incisions. Describe different types of grips Read relevant research article Use Digital Library 	Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 3,

		Practicals			
Code	Topic	At The End Of The Practical The Students Should Be Able To	C/P/A	Teaching Strategy	Assessment Tools
	Connective Tissue-I	Identify mucoid connective tissue under microscope	P		
		Illustrate histological structure of mucoid connective tissue	C2	-	
	Embryonic	Write two points of identification	C1	-	
152 15377 7 1 0052	connective tissue / mucoid	Identify reticular and adipose connective tissue under microscope	C2	-	
M2-MSK-I-A-0052	Connective Tissue	Illustrate histological structure of reticular and adipose connective tissue	C2	1	OSPE
	Loose areolar	Write two points of identification	C1	Skill Lab	MCQs
	connective tissue	Focus the slide	P	1	
	Reticular Connective Tissue				
	Adipose Connective Tissue				
	Connective Tissue-II	Identify dense regular and irregular connective tissue under microscope	P		
		Illustrate histological structure of dense regular and irregular connective tissue	C2	Skill Lab	
	Dense regular connective tissue	Write two points of identification	C1		OSPE MCQs
M2-MSK-I-A-0053		Differentiate between dense regular and irregular connective tissue microscopically	C2		
	Dense irregular connective tissue	Focus the slide	Р		
		Identify all three types of cartilages under microscope	P		
	Cartilage	Illustrate microscopic structure of all three cartilages	C2	-	
	Hyaline cartilage	Discuss the structure of perichondrium	C1	Skill Lab	OSPE
M2-MSK-I-A-0054	Elastic cartilage	Write wo points of identification	C1		MCQs
	Fibrocartilage	Enlist sites of hyaline, fibro and elastic cartilage	C1	-	-
		Focus the slide	P	1	

	Identify compact and spongy bone under microscope	P		
<u>Bone</u>	Illustrate microscopic structure of compact bone and spongy bone	C2	Skill Lab	OSPE
Compact Bone	Write two points of identification	C1		MCQs
Spongy Bone	• Focus the slide	P		

		Physiology			
		Theory			
Code	Topic	Learning Objectives At the end of session students should be able to	C/P/A	Teaching Strategy	Assessmen
M2-MSK-I-P-001	Structure of Neuron	Describe different parts of neuron	C1	LGIS SDL	SAQs MCQs VIVA VOC
MO MON I D 000	Classification of Navana and	Describe the classification of neurons and nerve fibers	C1	LGIS SDL	SAQs
M2-MSK-I-P-002	Classification of Neurons and nerve fibers, NGF	Describe NGF; given their roles	C1		MCQs VIVA VO
M2 MGIZ I D 002	Stimulus and Response & Types of Stimuli	Define stimulus	C1	LGIS	SAQs
M2-MSK-I-P-003		Describe various types of stimuli and response	C1		MCQs VIVA VOO
M2-MSK-I-P-004	Concept of degeneration and regeneration	Explain degeneration and regeneration of nerve fibers	C2	LGIS	SAQs MCQs VIVA VOO
M2-MSK-I-P-005	Properties of nerve fibers	Discuss the properties of nerve fibers	C2	LGIS	SAQs MCQs VIVA VOO
		Define graded Potential with examples	C1		SAQs

M2-MSK-I-P-006	Graded Potential, Comparison with action potential	Compare between graded potential and action potential	C2	LGIS	MCQs VIVA VOCE
		Understand the concept of Nernst potential and equilibrium potential for different ions	C2	LGIS	SAQs MCQs
M2-MSK-I-P-007	Nernst Potential	Define resting membrane potential of nerves.	C1	SDL	VIVA VOCE
	RMP	Explain the factors which determine the level of RMP	C2		
		Differences between electrical and chemical synapse	C2		
	RMP: & Measurement & effect	Describe the terms polarized and hyperpolarized	C1	LOIG	SAQs
M2-MSK-I-P-008	of Electrolytes,	Describe the role of various ions for these states	C1	LGIS	MCQs VIVA VOCE
M2 MCK LD 000	Ct	Define and draw action potential	C1	LCIC	SAQs
M2-MSK-I-P-009	Stages of Action Potential I&II –	Describe different phases of action potential	C1	LGIS	MCQs VIVA VOCE
	Recording of Action Potential Propagation of Action Potential	Briefly describe the method of recording resting membrane potential and action potential	C1		SAQs
M2-MSK-I-P-0010	& Factors effecting nerve	Describe the mechanism of propagation of action potential	C1	LGIS	MCQs VIVA VOCE
M2 MSK 11 0010	conduction Polarization and hyperpolarization state	Describe various factor that effect nerve conduction	C1		VIVAVOEL
M2 MCV I D 0011	Defendant David Different	Define refractory period and discuss its types	C1		SAQs
M2-MSK-I-P-0011	Refractory Period, Different types of Action Potentials	Describe various types of action potential	C1	LGIS SDL	MCQs VIVA VOCE
M2-MSK-I-P-0012	Synapse and synaptic transmission	Describe synapse and its types	C1	LGIS	SAQs MCQs VIVA VOCE

M2-MSK-I-P-0013	EPSP, IPSP, Properties of	Discuss in detail various properties of chemical	C2		SAQs
W12-WISK-1-F-0013	chemical synapse	synapse	C2	LGIS	MCQs
	J 1				VIVA VOCE
M2 MCV I D 0014	Duanautics of Chamical association	Discuss in detail various properties of chemical	C2		SAQs
M2-MSK-I-P-0014	Properties of Chemical synaptic	synapse	C2	LGIS	MCQs
					VIVA VOCE
	NMI Complexes and release of	Describe the physiologic anatomy of neuromuscular	C1		
	NMJ, Synthesis and release of Ach	junction.		LGIS	SAQs
M2-MSK-I-P-0015	Excitation-Contraction coupling	Recall Synthesis and release of Ach	C1	SDL	MCQs
		Describe the mechanism of transmission of impulses from nerve endings to skeletal muscle fibers	C1		VIVA VOCE
		Describe briefly the biochemistry of acetyl choline	C1		
M2 MGW I D 0016	D () D//	Enlist drugs that enhance and block transmission at	C1	LGIS	SAQs
M2-MSK-I-P-0016	Drugs acting on NMJ, Excitation-Contraction coupling	neuromuscular junction		SDL	MCQs
	Excitation-Contraction coupling •	Describe mechanism of excitation contraction coupling	C1		VIVA VOCE
142 140W 1 D 0017		Describe the salient features of myasthenia gravis and	C1		SAQs
M2-MSK-I-P-0017	Myasthenia Gravis, Lambert Eaton Syndrome	Lambert Eaton syndrome	C1	LGIS	MCQs
	—				VIVA VOCE

Code	Topic	Learning Objectives	C/P/A	Teaching	Assessment
		At the end of Session students should be able to		Strategy	Tool
M2-MSK-I-P-0018	Discussion regarding previous module	Discuss difficulties regarding questions, MCQs of Foundation Module	C2	SGD	MCQs SAQs Viva Voce OSPE
M2-MSK-I-P-0019		Define resting membrane potential of nerves.	C1		MCQs

	RMP, measurement & effects,	Explain the factors which determine the level of RMP		SGD	SAQs
	of electrolyte on RMP		C2		Viva Voce
					OSPE
		Drugs acting on NMJ	C1		MCQs
	Drugs acting on NMJ excitation	Excitation contraction coupling			SEQs
M2-MSK-I-P-0020	contraction coupling		C1	SGD	SAQs
					Viva Voce
					OSPE
	Synapse and synaptic	Describe synapse and its types	C1		MCQs
M2-MSK-I-P-0021	transmission & EBSP,IPSP	Differences between electrical and chemical synapse			SAQs
	properties of chemical synapse		C2	SGD	Viva Voce
					OSPE
		Concept of Nernst potential	C1		MCQs
M2-MSK-I-P-0022	Nernst potential	Equilibrium potential for different ions		SGD	SAQs
			C2		Viva Voce
					OSPE
		Transmission Across NMJ	C1		MCQs
M2-MSK-I-P-0023	Neuro muscular function (NMJ)	Diseases of NMJ		SGD	SAQs
			C2		Viva Voce
					OSPE
		Describe NGF	C1		MCQs
M2-MSK-I-P-0024	Nerve growth factor (NGF)	Give their role	C1	SGD	SAQs
		Explain De-generation and Re-Generation of nerve fibers	C2		Viva Voce
					OSPE

Code	Topics	Learning Objective	References
M2-MSK-I-P-0025	Structure of neurons Classification of neurons & nerve fibers	 Structure of neurons Myelinate Dand unmyelinated nerve fibers. Neuroglia Difference between neurons and glial cells 	 Ganong's Review of Medical Physiology.25TH Edition physiology Excitable Tissue; Nerve (Chapter 04, Page 85-90) Textbook of Medical Physiology by Guyton & Hall. 14thEdition. Introduction to Physiology. (Unit2, Chapter 05 Membrane Physiology Page74) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 01. Physiology of Body Fluids. (Chapter 03, Page 37)
M2-MSK-I-P-0026	Nernst potential, RMP	 Basic physics of membrane potential, 	Human Physiology by Dee Unglaub Silver thorn. 8 TH Edition. Chapter
		Nernst equation,	no. 05 membrane dynamics Page no.188)

		 Goldman Equation Origin of RMP indifferent cell types. 	 Textbook of Medical Physiology by Guyton & Hall.14th Edition Membrane Potential and action potential. (Unit 2,Chapter 05 Page 63) Ganong's Review of Medical Physiology. 25TH Edition, Excitable Tissue; Nerve (Chapter 04, Page 90) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 01. Properties and function of cell membrane. (Chapter 02, Page 31,41-43)
M2-MSK-I-P-0027	Properties of nerve fibers	 Rhythmicity of Excitable tissues, Characteristics of signal transmission, Types of refract toy period Concept of excitation 	 Textbook of Medical Physiology by Guyton & Hall. 14th Edition. Membrane Potential and action potential (Unit2, Chapter 05, Page 73-76) Ganong's Review of Medical Physiology.25TH Edition, Over view of cell physiology in medical physiology. Excite able Tissue; Nerve (Chapter04, Page 94) Physiological Basis of Medical Practice by Best &Taylor's.13th Edition.Section01. Property and function of cell membrane. (Chapter03,Page41,55)
M2-MSK-I-P-0028	Measurement of RMP & effect of electrolytes on RMP	 Measurement of RMP Effect of electrolyte son RMP Role of Na/K pump 	 Textbook of Medical Physiology by Guyton & Hall. 14th Edition. Membrane Potential and action potential (Unit2, Chapter 05, Page 65,67-70) Human Physiology by Dee Unglaub Silver thorn. 8THEdition.Chapter no.05 Membrane dynamics Page no.188-194) Physiology by Linda S. Costanzo 6th Edition. Cellular Physiology (Chapter01.Page18)
M2-MSK-I-P-0029	Concept of degeneration & regeneration	 Introduction Axonal Degeneration Wallerian Degeneration 	 Ganong's Review of Medical Physiology.25TH Edition, overview of cell physiology in medical physiology (chapter 6, page 133) A & P Anatomy and physiology Tortora, Chapter 12 Nervous tissue And Homeostasis Page 447 Ganong's Review of Medical Physiology.25TH Edition, overview of cell physiology in medical physiology (Chapter 4, page 97)
M2-MSK-I-P-0030	Stimulus & response & types of stimuli, Stages of action potential	 Neuron action potential, Stages of Propagation of AP Conduction Rates ALL-OR-NONE Principle 	 Textbook of Medical Physiology by Guyton & Hall.14th Edition.Introduction to Physiology. (Unit 2, Chapter 05 Membrane Potential and action potential Page 71) Ganong's Review of Medical Physiology.25TH Edition, Excitable Tissue; Nerve (Chapter 04,Page 93) Physiology by Linda S. Costanzo 6thEdition. cellular Physiology (Chapter 01. Page 25)

		Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 01. Properties and function of cell membrane. (Chapter 03,Page 45,47-51)
M2-MSK-I-P-0031 types com	Refractory period, sof action potential. Graded potential parison with action potential B. Recording & pagation of action potential & factors effecting nerve conduction & perpolarized state Threshold Potential Action potential Types of Action Potential Propagation of Act Hyperpolarization Factors effecting Action Potential Types of Action Potential Propagation of Act Hyperpolarization Factors effecting Action Potential Propagation of Act Hyperpolarization Factors effecting Action Potential Propagation of Act Hyperpolarization Potential Propagation of Act Propagation of Act Propagation of Act Propagation Potential Propagation P	• Textbook of Medical Physiology by Guyton & Hall.14th Edition. Introduction to Physiology. (Chapter 5, page 67).

		Practical			
Code	Topic	At the end of practical students should be able to	Learning Domain	Teaching Strategy	Assessment Tool
M2-MSK-I-P-0032	Estimation of hemoglobin Practical I	 Apparatus identification Detail procedure Precautions Aseptic measures taken during blood sampling 	P, A	Skill lab	OSPE
M2-MSK-I-P-0033	Estimation of hematocrit Practical I	 Hct definition How to measure Precautions	P,A	Skill lab	OSPE
M2-MSK-I-P-0034	ESR	ProcedurePrecautions	P,A	Skill lab	OSPE

	Practical I	Clinical importance of ESR, normal values			
M2-MSK-I-P-0035	Preparation of DLC	 Preparation of slide – practice How to make blood film How to stain it after preparation Help of teaching aid identification of cells 	P,A	Skill lab	OSPE

		Biochemistry				
	Theory					
Code	Topic	Learning Objectives At the End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool	
		Minerals & Vitamins				
M2-MSK-I-B-001	Minerals classification and Introduction.	 Classify Minerals State Daiy Requirements of Calcium in different conditions 	C1 C2		MCQs, SAQs &	
WIZ WISIK I B 001	Calcium Phosphate	Discuss Types & Sources of Calcium phosphate	C2	LGIS	Viva	
M2-MSK-I-B-002	Biochemical Role of Calcium & Phosphate	 Discuss causes of Hypercalcemia & Hypocalcemia Describe effects of Hypercalcemia & Hypocalcemia State Daily Requirements of Phosphate Discuss Biochemical functions of Phosphate 	C2 C2	LGIS	MCQs, SAQs & Viva	
M2-MSK-I-B-003	Fluoride, Magnesium, Sulphur	 Elaborate Biochemical functions of Fluoride, Sulphur & Magnesium Describe Deficiency Effects 	C2 C1	LGIS	MCQs, SAQs & Viva	

	Iodine, Copper, Zinc, Selenium, Manganese	 Recall sources & daily requirements Discuss their biochemical functions Describe Deficiency Effects 	C1 C2	LGIS	MCQs, SAQs & Viva
M2-MSK-I-B-004	Vitamins & Their Classification Vitamin A and E	 Classify Vitamins & Water-Soluble Vitamins Enlist Sources of Vitamin A & E Describe Biochemical functions of Vitamin A & E Describe Deficiency Effects of Vitamin A & E Explain Toxic Effects of Vitamin A 	C2 C1	LGIS	MCQs, SAQs & Viva
M2-MSK-I-B-005	Vitamin D	 Enlist Sources of Vit.D Explain Steps of activation of Vit.D in the body Describe Biochemical functions of Vit.D Explain Deficiency effects of Vit.D Explain Toxic effects of Vit.D 	C1	LGIS	MCQs, SAQs & Viva
M2-MSK-I-B-006	Vitamin C	 Enlist Sources of Vit.C Describe Biochemical functions of Vit.C Explain Deficiency effects of Vit.C Explain Toxic effects of Vit.C 	C1	LGIS	MCQs, SAQs & Viva
M2-MSK-I-B-007	Niacin & Thiamine	 Enlist Sources Describe Biochemical functions Explain Deficiency effects 	C1 C2	LGIS	MCQs, SAQs & Viva
M2-MSK-I-B-008	Classification & Structure of Amino Acids	Classification & Structure of Amino Acids & Isomerism of Amino Acids	C2	LGIS	

			MCQs, SAQs & Viva
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Code	Topic	Learning Objectives	Learning Domain	Teaching Strategy	Assessment Tools
M2-MSK-I-B-009	Classification of Vitamins	Define Vitamins	C1		MCQ SAQ
		Introduction & Classification of Vitamins	C1		VIVA
		Discuss sources, functions and clinical significance of vitamin E.	C2		
M2-MSK-I-B-0010	Minerals			SGD	MCQ
		Discuss Sources, Functions and Clinical Significance Calcium, Phosphate, Iodine, Fluoride, Copper, Zinc, Selenium, Magnesium, Sulphur And Cobalt.	C2		SAQ VIVA

Code	Topics	Learning Objective	References	
	Minerals & Vitamins			
M2-MSK-I-B-0011	Minerals Introduction Classification Calcium and phosphate	 State Daily Requirements of Calcium in different conditions State Daily Requirement of Phosphate in different condition Classify Minerals Discuss Types Sources of Calcium Sources of Phosphate 	 Textbook of Lippincott 8th Edition Chapter # 29 page#466-467 Textbook of Harper 32nd Edition Chapter # 44 page# 540 https://www.ncbi.nlm.nih.gov/books/NBK218735 https://youtu.be/34FTvJZCrt4 	
M2-MSK-I-B-0012	Biochemical Role of Calcium & Phosphate	 Discuss causes of Hypercalcemia Discuss causes of Hypocalcemia Describe effects of Hypercalcemia & Hypocalcemia State Daily Requirements of Phosphate Discuss 	 Textbook of Lippincott 8th Edition Chapter # 29 page #466-467 https://www.ncbi.nlm.nih.gov/books/NBK279023/ https://youtu.be/qAeWKCXDniw 	

		Biochemical functions of Phosphate	
M2-MSK-I-B-0013	Fluoride, Magnesium, Sulphur	 Elaborate Biochemical functions of Fluoride, Sulphur & Magnesium Enlist Sources of Fluoride, Sulphur. Magnesium Describe Deficiency Effects 	 Textbook of Lippincott 8th Edition Chapter # 29 page #468 https://www.ncbi.nlm.nih.gov/ https://youtu.be/PTOJNdtuXro
M2-MSK-I-B-0014	Iodine, Copper, Zinc, Selenium, Manganese	 Recall sources & daily requirements Discuss their biochemical functions Describe Deficiency Effects 	 Textbook of Lippincott 8th Edition Chapter # 29 page #449-454 https://youtu.be/1i9fSQSvYI0 https://pubmed.ncbi.nlm.nih.gov/
M2-MSK-I-B-0015	Definition of Vitamins &Classification of Vitamins Vitamin A and E	 Classify Fat- & Water-Soluble Vitamins Enlist Sources of Vitamin A & E Describe Biochemical functions of Vitamin A & E Describe Deficiency Effects of Vitamin A & E Explain Toxic Effects of Vitamin A 	 Textbook of Lippincott 8th Edition Chapter # 28 page #423,432-436,441,444 Textbook of Harper 32nd Edition Chapter # 44 page# 528-529 https://byjus.com/chemistry https://youtu.be/7ZFr9xiAt94
M2-MSK-I-B-0016	Biochemical Role of Vitamin D	 Enlist Sources of Vit.D Explain Steps of activation of Vit.D in the body Describe Biochemical functions of Vit.D Explain Deficiency effects of Vit.D Explain Toxic effects of Vit.D 	 Textbook of Lippincott 8th Edition Chapter # 28 page # 437-440 Textbook of Harper 32nd Edition Chapter # 44 page# 530-532 https://byjus.com/chemistry https://youtu.be/6xhE5e16X0c
M2-MSK-I-B-0017	Deficiency Manifestation of Vitamin A and D	Explain Deficiency effects of vitamin A and D	 Textbook of Lippincott 8th Edition Chapter # 28 Page #435,439 Textbook of Harper 32nd Edition Chapter # 44 page# 530-532 https://www.ncbi.nlm.nih.gov/ shttps://youtu.be/ZCINiQX-mxU
M2-MSK-I-B-0018	Deficiency manifestation of Thiamine	• Explain Deficiency effects	 Textbook of Lippincott 8th Edition Chapter # 28 Page #429,430 Textbook of Harper 32nd Edition Chapter # 44 page# 534 https://www.ncbi.nlm.nih.gov/ https://youtu.be/WAkXS8lgoA0

M2-MSK-I-B-0019	Niacin and Thiamine Classification & Structure of Amino Acids	 Classification & Structure of Amino Acids & Isomerism of Amino Acids Enlist Sources Niacin and Thiamine Describe Biochemical functions Niacin and Thiamine Explain deficiency effects of Niacin and Thiamine 	 Textbook of Lippincott 8th Edition Chapter # 28and 1 Page #1-5 &429-431 Textbook of Harper 32nd Edition Chapter # 44 page# 534-535 https://microbenotes.com/ https://youtu.be/9pwBUTIcxHk

Practical						
Code	Topic	At the End of Practical Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool	
	Color test for detection of amino	Biuret test	P	Skill Lab	OSPE	
M2-MSK-I-B-0020	acids	Ninhydrin Test	_	SKIII Lab	USPE	
	Color test for detection of amino	Xanthoprotic Test	P	Skill Lab	OSPE	
M2-MSK-I-B-0021	acids	Million- Nasse's Test		SKIII Lab	USPE	
	Color test for detection of amino	Arginine by Sakaguchi's Test	P	Skill Lab	OSPE	
M2-MSK-I-B-0022	acids	Tryptophan by Aldehyde Test	1	SKIII Lau	OSPE	
	Quantitative Analysis	Serum calcium	P	Skill Lab	OSPE	
M2-MSK-I-B-0023		Serum Ascorbic Acid				

Basic and Clinical Sciences (Vertical Integration)

Anatomy, Physiology & Biochemistry **Clinical Themes Learning Objectives Subject Topic Learning Domain** At the end of the lecture the student should be able to C1 Apply basic knowledge of subject to study clinical case. Shoulder Anatomy Dislocation Apply basic knowledge of subject to study clinical case. Wrist Drop C3 Apply basic knowledge of subject to study clinical case. C3 Paresthesia Physiology Apply basic knowledge of subject to study clinical case. C3 Insecticide poisoning Apply basic knowledge of subject to study clinical case. C3 Night Blindness Biochemistry Apply basic knowledge of subject to study clinical case. C3 • Rickets **Topic Learning Objectives** Learning **Teaching Strategy Assessment Tool** At the end of the lecture the student should be able **Domain** At the end of session students will be able to **LGIS MCQs** C21. Categorize different types of accidents Accidents 2. Describe risk factors involved in accidents C2 3. Participate in activities/programs for prevention C2and control of accidents 4. Describe steps involved in prevention of C2

different types of accidents.

		Medicine			
		Theory			
Code	Topic	Learning Objectives	Learning	Teaching	Assessment Tool
		At the end of the lecture the student should be able to	Domain	Strategy	
		Enlist causes Osteoporosis	C2		
M2-MSK-I-VI(M)-001	Osteoporosis	Discuss changes in bones in Osteoporosis	C2		
1412-141314-1- 4 1(141)-001		Describe clinical features	C2	LGIS	MCQs
		Enlist investigation	C3		
		Discuss management	C2		
		 Differentiate different causes of polyarthritis on basis of clinical features 	C2		
		• Discuss the diagnostic criteria of rheumatoid arthritis		LGIS	MCQs
M2-MSK-I-VI(M)-002	Polyarthritis	Discuss the diagnostic criteria of SLE	C2		
		Plan investigations of a patient with polyarthritis to find out etiology	C3		
		• Discuss general and specific management of a patient with polyarthritis	C2		
		• Enlist causes of rickets	C1		
		Discuss changes in bones in osteomalacia	C2		
M2-MSK-I-VI(M)-003	Osteomalacia	Describe clinical features of osteomalacia & rickets	C2	LGIS	MCQs
	/rickets	Enlist investigations for of osteomalacia & rickets	C1		
		Discuss management of osteomalacia & rickets	C2		

	Surgery						
Theory							
Code	Topic	Learning Objectives	Learning Domain	Teaching	Assessment Tool		
		At the end of the lecture the student should be able to		Strategy			
MO MOV I VICO 001	Shoulder dislocation	Discuss the possible sites of shoulder dislocation	C2	LCIC	MCQs		
M2-MSK-I-VI(S)-001		Discuss the consequences of dislocation	C2	LGIS			
		Management concepts	C2	=			
	Tennis elbow, fracture of olecranon, radius and ulna	Describe:Tennis elbow	C2	LGIS	MCQs		
M2-MSK-I-VI(S)-002	olectation, radius and uma	Discuss fractures of radius and ulna	C2	=			
		Describe the common sites of fracture	C2				
		Management concepts	C2				

Spirally Integrated Courses / General Education Cluster (GEC) Courses

	Т	he Holy Quran Translation Lecture			
		Theory			
Code	Topic	Learning Objectives	Learning	Teaching	Assessment
		At the end of the lecture the student should be able to	Domain	Strategy	Tool
		Describe the Concept of Tauheed			
M2-MSK-I-VI(HQT)-001	.	• Explain the attributes of pious	C2	LGIS	SAQ
	Imaniat	Discuss the attributes of Allah Almighty			
		• Explain Hazarat Uzair's and Hazarat Ibrahim's			
		experience about resurrection			

	Seerat Mubarak			
	Theory			
Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain	Teaching Strategy	Assessment Tool
The Significance of Seerah Studies	 Discuss the meaning of Seerat un Nabi Explain the importance of knowing the Seerah of Prophet 	C2	LGIS	SAQ

	Family Medicine			
	Theory			
Topic	Learning Objectives	Learning Domain	Teaching Strategy	Assessment Tool
	At the end of the lecture the student should be able to			
Approach to a Patient	Describe presenting complains of patients with body aches	C3	LGIS	MCQs
with body aches	Discus complications of body aches		2010	MCQ5
	Describe initial treatment of patients with body aches			
	Know when to refer patient to consultant/ Hospital			

Integrated Undergraduate Research Curriculum (IUGRC)
Theory

То	opic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain	Teaching Strategy	Assessment Tool
		Practical based teachings	<u> </u>		
		Comprehend their role in under "theme and scheme" of IUGRC-1st Year Practical component			
	Session -I Activity)	• Understand the techniques used to access, retrieve, and review and source of Scientific literature on the given topics (on selected topics for "updated evidence in Health" (UEIH) for poster development.			
		Make search string and perform literature search using Boolean operators	G2	LGIS	MCQS
		Access scientific databases and carry out an effective literature review using a number of sources or databases (PubMed)	C3		
		Access HEC Digital library / PERN network use			
		Understand EBM Cycle & its 5 steps			
		How to configure & present a scientific poster / element of a scientific poster			
		How to write References of the information cited			
		Learn overall posters' work reporting guidelines			

	Biomedical Ethics & Professionalism			
	Theory			
Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain	Teaching Strategy	Assessment Tool
Islamic concepts of Bioethics	 Conceptualize the Islamic teachings of medical ethics Outline the main points in oath of Muslim doctor Correlate the 4 principles of medical ethics with principles of Islamic medical ethics 	C2 C2	LGIS	MCQs

		Radiology/Artificial Intelligence (Innovation)			
		Theory			
	Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain	Teaching Strategy	Assessment Tool
	Fractures of upper limb	 Discuss fractures of upper limb with their clinical significance. Discuss role of artificial intelligence in interpretation of radiographs 	C2	LGIS	MCQS



Block-II

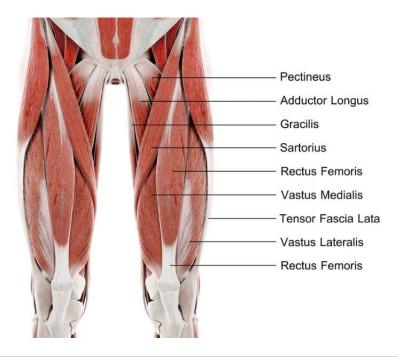
Course Contents

- Module III- Musculoskeletal Module II
- Module IV- Blood & Immunity Module

Block-II

Module No. 3 – Musculoskeletal-II

Duration 5 Weeks



MSK-II Module Team

Module Name : MSK- II Module

Duration of module : 05 Weeks

Lectures

Focal Person Family Medicine

Coordinator : Dr. Fahd Anwar
Co- Coordinator : Dr. Sajjad Hussain
Reviewed by : Module Committee

Dr. Sadia Khan

Kev	newed by :	Module Committe	ee				
	Module Comr	nittee	Module Task Force Team				
1.	Vice Chancellor RMU	Prof. Dr. Muhammad Umar	1.	Coordinator	Dr. Fahd Anwar (Demostrator of Physiology)		
2.	Chairperson Anatomy & Dean	Prof. Dr. Ayesha Yousaf	2.	DME Focal Person	Dr. Farzana Fatima		
	Basic Sciences						
3.	Director DME	Prof. Dr. Ifra Saeed	3.	Co-coordinator	Dr. Sajjad Hussain (Senior Demonstrator of Anatomy)		
4.	Chairperson Physiology	Prof. Dr. Samia Sarwar	4.	Co-Coordinator	Dr. Almas (Senior Demonstrator Biochemistry		
5.	Chairperson Biochemistry	Dr. Aneela Jamil	5.	Co-coordinator	Dr. Fareed Ullah Khan (Senior Demonstrator Physiology) &		
					Clinical Co- Coordinatior		
6.	Focal Person Anatomy First Year	Asso. Prof. Dr. Mohtashim Hina					
	MBBS						
7.	Focal Person Physiology	Dr. Sidra Hamid		DM	IE Implementation Team		
			1.	Director DME	Prof. Dr. Ifra Saeed		
8.	Focal Person Biochemistry	Dr. Aneela Jamil	2.	Assistant Director DME	Dr. Farzana Fatima		
9.	Focal Person Pharmacology	Dr. Zunera Hakim	3.	Implementation Incharge 1st & 2 nd	Prof. Dr. Ifra Saeed		
				Year MBBS	Dr. Farzana Fatima		
10.	Focal Person Pathology	Dr. Asiya Niazi	4.	Editor	Muhammad Arslan Aslam		
11.	Focal Person Behavioral Sciences	Dr. Saadia Yasir					
12.	Focal Person Community Medicine	Dr. Afifa Kulsoom					
13.	Focal Person Quran Translation	Dr. Uzma Zafar					

			Themes							
Block	Module	General Anatomy	Embryology	Histology	Gross Anatomy					
	 Anatomy 	MusclesSkin	 Development of Axial Skeleton Development of limbs Development of muscles 	General Histology Muscles Skin Skin appendages	Gluteal Region to Lateral compartment of leg					
	Biochemistry	Protein chemistry	y, Protein separation techniques, Collagen	and Elastin						
	 Physiology 	 Sarcotubular system, excitation contraction coupling mechanism inskeletal muscle. Molecular Mechanism of skeletal muscle contraction, Rigormortis, Muscular dystrophies Introduction to muscle physiology, Structure of sarcomere Energetics, efficiency and types of contraction, heat production in muscle Physiologic anatomy, types and properties of Smooth Muscle Mechanism of smooth muscle contraction & its control Introduction to pericardium Properties of myocardium & endocardium, myocardial action potential Regulation of myocardial activity Comparison of 3 types of Muscle Introduction to CVS 								
II –	Excitatory & Conducting system of heart Spiral Courses									
	Bioethics & Professionalism	Introduction to FHistory of Medic	Professional Ethics and PM&DC Code of C	onduct						
	Behavioural Sciences	Communication Skills Rights and Responsibilities of patients and doctors								
	Artificial Intelligence	Introduction to Atificial Intelligence								
	Family Medicine	Communication	and consultation skills in Family Medicine	Practice						
	The Holy Quran Translation	 Imaniat-I Ibadat-II Ibadat-III Immaniat-II Immaniat-III Ibadat-IV 								
	Seerat Mubarak	Importance of H	adees and Sunnah							
		•	Vertical Integration	n						

x-rays of hipbone lower limb (Rad	Early Clinical Exposure (ECE)
Clinical Rotations	 Cases of myopathies/ muscular dystrophy Polymyositis/Muscle atrophy Muscle enzyme interpretation Medicine
	 Burns and Plastic Surgery Management of superficial and deep burns Surgery
	 X-Ray of Hip Bone and Hip Joint X ray of pelvis X ray of long Bones Radiology
	Clinical Relevance
Fractures of Lower Limb Muscular Dystrophies Muscle Strains and their Manageme	ent (e.g., hamstring injury)
Muscle Strains and their ManagemePathophysiology of Myasthenia Grand	ravis
Carpal Tunnel Syndrome: DiagnosiSciatica: Causes, Diagnosis, and M	

Polymyositis and Dermatomyositis: Clinical Features and Diagnosis

Compartment Syndrome: Pathophysiology and Emergency Management Rheumatoid Arthritis: Pathology and Joint Deformities

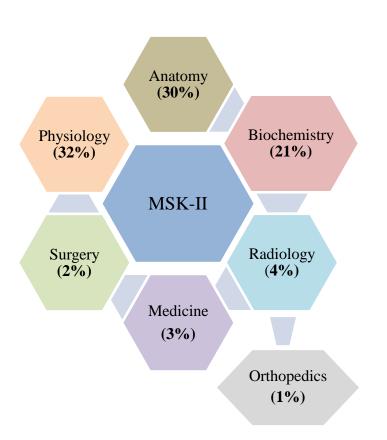
Rotator Cuff Injuries: Mechanisms and Management

Tendon Injuries (e.g., Achilles tendon rupture)Role of Physical Therapy in Post-Injury Rehabilitation

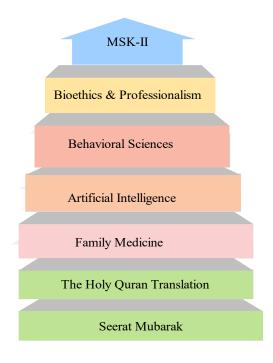
Implementation of Terms of Reference (TORS)

- Total hours of teaching, learning and formative/summative internal assessment to be completed in a year are predefined as per the guidelines of PMDC and to be strictly followed.
- The hours mentioned within each module are the mandatory minimum required.
- The content and the intended learning outcomes written are mandatory, to be taught, at the level required, as the end year assessment will be based on these. However, the level of cognition can be kept at a higher level.
- The Table of Specifications provided will be used for the three papers of the first professional examination.
- The same table of specifications should be used for the respective block exams for internal assessment.
- The criteria defined for continuous internal assessment is to be followed for each module and block respectively

Integration of Disciplines in Musculoskeletal-II Module



Spiral / General Education Cluster Courses (7%)



Module No. 3 – MSK-II

Rationale: This module describes the structural organization, functions, and congenital anomalies of musculoskeletal system. It explains the mechanism of neuromuscular transmission, comparison of three types of muscle and physiology of smooth and cardiac muscle, its biochemical basis and the importance of Ca++ in the body. This module covers cardiac muscle physiology including conducting system of heart. It depicts structure and function of joints in upper and lower limb. It elaborates identification of common fractures of long bones on radiograph.

Module Outcomes

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

Knowledge:

- 1. Explain the development & structure of musculoskeletal system.
- 2. Explain the physiological and biochemical factors affecting neuromuscular transmission.
- 3. Explain physiology of smooth and cardiac muscle.
- 4. Apply the knowledge of the basic sciences to understand common fractures.
- 5. Use technology based medical education including.
 - Artifical Intelligence.
- 6. Appreciate concepts & importance of
 - Family Medicine
 - Biomedical Ethics
 - Research

Skill:

- 1. Dissect limbs to demonstrate regional Anatomy and relationships of various structures to each other.
- 2. Identify histological features of connective tissue and muscles under microscope.
- 3. Perform practicals on estimation of calcium and protein chemistry.

Attitude:

1. Demonstrate a professional attitude, team building spirit and good communication skills and cadaveric handling



Syllabus of Musculoskeletal-II (Module No. 3)

	Anatomy			
	Theory			
Topic	Learning Objectives	Learning	Teaching	Assessment
	At The End Of Lecture Students Should Be Able To:	Domain	Strategy	Tools
	Classify muscles with examples according to	C1		
	i) Shape`			
	ii) Histology			
	iii) Development			
	iv) Contraction			MCQ
General Anatomy	Describe the general features of skeletal muscle.	C3	LGIS	SAQ
(Muscle I)	Differentiate between Red white and intermediate fibers.	C3		VIVA
	Describe blood supply and nerve supply of skeletal muscles.	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 relevant research article	С3		
	Classify muscle on histological basis.	C1		
	Describe histological structure of skeletal muscles	C2		
Histology	Discuss ultrastructure of skeletal muscles	C2		MCQ
(Skeletal Muscle)	Understand the contraction mechanisim	C2	LGIS	SAQ
	Correlate the clinical conditions	С3		VIVA
	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 relevant research article	C3		
	 Discuss connective tissue associated with skeletal muscle. Discuss parts of skeletal muscles. 	C2 C2		
General Anatomy	 Give classification of skeletal muscles. Explain the actions of a prime mover or agonist Fixators 	C1		
(Muscle II)	Synergist and antagonist with examples.Correlate the clinical conditions	C2 C3	LGIS	MCQ
	Understand the preventive and curative health care measures	C3		SAQ
	Practice the principles of Bioethics	C3		VIVA
	Apply strategic use of AI in health care	C3		
	Read relevant research article	C3		
	Describe histological structure of cardiac and smooth	C2		
	 muscles Describe ultrastructure of smooth and cardiac muscles. 	C2		
	Differentiate between skeletal smooth and cardiac muscles.	C2		
Histology	Discuss regeneration of muscle fibers	C2		MCQ
(Cardiac & Smooth	Correlate the clinical conditions	C3	LGIS	SAQ
Muscles)	Understand the preventive and curative health care measures	C3		VIVA
	Practice the principles of Bioethics	C3		
	Apply strategic use of AI in health care	C3		
	Read relevant research article			
	Enlist components of integumentary system	C1		
	Describe histological structure of skin with special reference	C2		
Histology	to cells residing in epidermis.Describe histological features of thick and thin skin			MCQ
(Skin)	 Describe histological features of thick and thin skin Differentiate between thick and thin skin 		LGIS	SAQ
	Correlate the clinical conditions	C2		VIVA

	Understand the preventive and curative health care measures	C2		
	 Practice the principles of Bioethics 	C3		
		C3		
	Apply strategic use of AI in health care	C3		
	Read relevant research article			
	Discuss the cartilagenous stage of vertebral column	C2		
Embryology	Discuss the bony stage of vertebral column	C2		MCQ
(Development Of	Describe development of ribs and sternum.	C2	LGIS	SAQ
Axial Skeleton)	Correlate the clinical conditions	C3		VIVA
	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 relevant research article	C3		
	Tread refevant research article	C3		
	Describe appendages of skin	C2		
	Discuss histological structure of hair	C2		
	Discuss histological structure of nail	C2		MCQ
Histology	Discuss histological structure of glands of skin	C2	LGIS	SAQ
(Skin Appendages)	Correlate the clinical conditions	C3		VIVA
	 Understand the preventive and curative health care measures 	C3		
	_	C3		
	Practice the principles of Bioethics	C3		
	Apply strategic use of AI in health care	C3		
	Read relevant research article	C3		
	Enlist different stages of limb development	C1		
Embryology	 Discuss early and late stage of limb development 	C2		MCQ
Zmeryology	Discuss carry and rate stage of finite development			

(Development of	Correlate congenital anomalies of limb development	C3	LGIS	SAQ
limbs)	Correlate the clinical conditions	C3		VIVA
	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 relevant research article	C3		
	Discuss development of skeletal muscle with special	C2		
	reference to myotomes, pharyngeal arch muscles and limb muscle along with limb skeleton.	C2		
Embryology	Describe development of smooth and cardiac muscles with			MCQ
(Development Of Muscles)	anomalies.	C3	LGIS	SAQ
iviuscies)	Correlate the clinical conditions	C3		VIVA
	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 relevant research article	C3		
	Enlist functions of skin	C1		
	Discuss types of skin	C2		
	Compare between thick and thin skin	C2		MCQ
	Classify skin lines	C1	LGIS	SAQ
General Anatomy	Describe the significance of skin lines	C2		VIVA
(Skin)	Discuss burns of skin	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 relevant research article	C3	

Торіс	Learning Objectives Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tools
Hip Bone-I	 Demonstrate the anatomical position Identify bony features of ilium. Describe the muscular, ligamentous, and capsular attachments. Discuss the ventral and dorsal auricular surfaces, ossification. Correlate the clinical conditions Understand the preventive and curative health care measures Practice the principles of Bioethics Apply strategic use of AI in health care Read relevant research article 	P C1 C2 C2 C3 C3 C3 C3 C3 C3	Skill Lab	MCQ SEQ VIVA OSPE
Hip Bone-II	 Demonstrate the anatomical position Identify bony features of pubis and ischium. Describe the muscular, ligamentous, and capsular attachments. Discuss the ventral and dorsal auricular surfaces, ossification. Correlate the clinical conditions Understand the preventive and curative health care measures Practice the principles of Bioethics Apply strategic use of AI in health care Read relevant research article 	P C1 C2 C2 C3 C3 C3 C3 C3 C3	Skill Lab	MCQ SEQ VIVA OSPE
Femur	 Demonstrate the anatomical position of bone Demonstrate different parts Describe proximal and distal articulations State angle of femoral torsion. Correlate the clinical conditions Understand the preventive and curative health care measures Practice the principles of Bioethics Apply strategic use of AI in health care 	P C1 C2 C1 C3 C3 C3 C3	Skill Lab	MCQ SEQ VIVA OSPE

	Read relevant research article	C3		
	Demonstrate the anatomical position of bones	P		
	 Describe muscle attachment and ossification 	C2		
	 Discuss fractures with special reference to the fracture of neck of 	C2		
	femur in old age.	C2		
Femur and	• Describe anatomy of patella and factors responsible for its stability.	C1	G1 111 T 1	MCQ
Patella	 Enumerate different bursae related to patella 	C3	Skill Lab	SEQ
	 Correlate the clinical conditions 	C3		VIVA OSPE
	 Understand the preventive and curative health care measures 	C3		OSPE
	 Practice the principles of Bioethics 			
	 Apply strategic use of AI in health care 	C3		
	Read relevant research article	C3		
	• Describe the origin and insertion of muscles in anterior compartment	C2		
	of thigh.			
Anterolateral	• Describe the origin and insertion of muscles in lateral compartment	C2		MCO
Anterolateral Compartment of	of thigh.		Skill Lab	MCQ SEQ
Thigh (Muscles)	Discuss the femoral triangle and adductor canal with contents	C2	Skiii Lau	VIVA
Tingn (Muscles)	• Identify these muscles.	C1		OSPE
	Correlate the clinical conditions	C3		OSIL
	Understand the preventive and curative health care measures Provides the principles of Providing	C3		
	Practice the principles of Bioethics Apple of the principles of A Line backles are a second at the principles of Bioethics Output Description:	C3		
	 Apply strategic use of AI in health care Read relevant research article 	C3		
	Read relevant research article	C3		
	Describe the nerves and vessels of anterolateral compartment of	<i>C3</i>		
	thigh	C2		
Anterolateral	 Discuss various relation of vessels and nerves in anterolateral 	C2		MCQ
compartment of thigh	compartment of thigh	C2	Skill Lab	SEQ
(Neurovascular	 Identify these structures 	C 1		VIVA
organization)	 Map the outline of femoral artery in a simulated patient / model 	P		OSPE
	 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 relevant research article	C3		
	Describe the muscles of medial compartment of thigh	C2		
	 Discuss origin, insertion and nerve supply of medial compartment of thigh 	C2	Skill Lab	MCQ SEQ
	 Describe the course relations and branches of obturator nerve. 	C2		VIVA
Medial Compartment	 Correlate the clinical conditions 	C3		OSPE
of thigh	 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 relevant research article	C3		
	Tabulate the he various muscles of gluteal region with origin, insertion particular appropriate to the control of the co	C2		
	insertion, action nerve supply.	C1		MCQ
Gluteal Region	• Enlist various structures undercover of gluteal maximus i.e. muscles, vessels, nerves, bones and joints, ligaments, bursae.	CI		SEQ
(Muscles)	Understand the preventive and curative health care measures	C3	Skill Lab	VIVA
(Maseles)	 Practice the principles of Bioethics 	C3	Skiii Ede	OSPE
	 Apply strategic use of AI in health care 	C3		
	 Read relevant research article 	C3		
	Describe trochancteric anastomosis and cruciate anastomosis.	C2		
	• Enumerate the structures passing through greater sciatic foraman.	C1		
	 Discuss the formation course relations, branches, distribution of 	C2		MCQ
Gluteal Region	sciatic nerve with applied anatomy	C2	Skill Lab	SEQ
(Neurovascular	Correlate the clinical conditions	C3		VIVA
organization)	 Understand the preventive and curative health care measures 	C3		OSPE
	 Practice the principles of Bioethics 	C3		
	 Apply strategic use of AI in health care 			
	Read relevant research article	C3		
	Enlist the Hamstring muscles	C 1		
	 Discuss origin insertion, nerve supply and actions 	C2		MCQ
Posterior	Identify the muscles	C1	A	SEQ
Compartment of	 Correlate the clinical conditions 	C3	Skill Lab	VIVA
Thigh	 Understand the preventive and curative health care measures 	C3		OSPE
(Muscles)	 Practice the principles of Bioethics 	C3		
	Apply strategic use of AI in health care			

	Read relevant research article	C3		
		C3		
Posterior Compartment of thigh (Neurovascular Organization)	 Describe the nerves and vessels of posterior compartment of thigh Discuss course, relations, distribution and branches of neurovascular structures of posterior compartment Identify these structures Correlate the clinical conditions Understand the preventive and curative health care measures Practice the principles of Bioethics Apply strategic use of AI in health care Read relevant research article 	C2 C2 C1 C3 C3 C3 C3 C3	Skill Lab	MCQ SEQ VIVA OSPE
Hip Joint	 Describe the type of joint Describe articular surfaces, Describe capsular attachments. Discuss synovial membrane and its folding. Enlist ligaments and their attachments Discuss movements possible at hip joint and muscles producing them Describe blood supply and nerve supply. Correlate the clinical conditions Understand the preventive and curative health care measures Practice the principles of Bioethics Apply strategic use of AI in health care Read relevant research article 	C2 C2 C2 C2 C1 C2 C3 C3 C3 C3 C3	Skill Lab	MCQ SEQ VIVA OSPE
Tibia	 Identify bone Demonstrate its side. Demonstrate its normal anatomical position. Describe bony features. Discuss attachment of muscle and ligament Describe articular surfaces Identify nutrient foramen Describe its ossification Correlate the clinical conditions Understand the preventive and curative health care measures 	C1 P P C2 C2 C2 C1 C2 C3	Skill Lab	MCQ SEQ VIVA OSPE

	Practice the principles of Bioethics	C3		
	Apply strategic use of AI in health care	C3		
	Read relevant research article	C3 C3		
		C3		
	Identify bone	C1		
	Demonstrate its side.	P		
	 Demonstrate its side. Demonstrate its normal anatomical position. 	P		
	D 11 1 0	C2		MCQ
Fibula	•	C2	Skill Lab	SEQ
	 Discuss attachment of muscles and ligaments Describe articular surfaces 	C2		VIVA
		C1		OSPE
	Identify nutrient foramen	C2		
	Describe its ossification	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 relevant research article	C3		
	Identify surface landmarks	C1		
Popliteal Fossa	Enlist contents	C 1		MCQ
	Discuss boundaries, roof and floor	C2	Skill Lab	SEQ
	Map the outline of popliteal artery in a simulated patient / model	P		VIVA
	Correlate the clinical conditions	C3		OSPE
	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 relevant research article	C3		
	State type of joint	C1		
	Describe its articular surfaces	C2		
	 Demonstrate capsular attachments, 	P		
	Enlist extra capsular and intracapsular ligaments and their			
	attachments	C 1		MCQ
Knee Joint	Demonstrate the movements possible at knee joint and muscles		Skill Lab	SEQ
	producing them.	P		VIVA
	production.			OSPE

Anterior Compartment of Leg (Muscles and Neurovascular Organization)	 Describe the concept of locking and unlocking of knee joint Describe blood supply and nerve supply of joint Correlate the clinical conditions Understand the preventive and curative health care measures Practice the principles of Bioethics Apply strategic use of AI in health care Read relevant research article Demonstrate surface landmarks Discuss superficial fascia & deep fascia, their contents including retinecula Describe Origin, insertion, nerve supply and action of all muscles of anterior compartment of leg Identify different structures in compartment Correlate the clinical conditions Understand the preventive and curative health care measures Practice the principles of Bioethics Apply strategic use of AI in health care 	C2 C2 C3 C3 C3 C3 C3 C2 C2 C1 C3 C3 C3 C3	Skill Lab	MCQ SEQ VIVA OSPE
Radiology / Cross Sectional Anatomy	 Read relevant research article Demonstrate major landmarks of thigh and anterior compartment of leg on radiographs Identify the structures present at different levels of cross sections Upper 3rd of thigh Mid shaft of femur Lower 3rd of thigh Upper part of patella Distal part of patella Through tibial condyles Correlate the clinical conditions 	C3 P C2 C3	Skill Lab	MCQ SEQ VIVA OSPE

Topics Of SDL	Learning Objective	References
Hip Bone	 Demonstrate the anatomical position Identify bony features of ilium. Describe the muscular, ligamentous, and capsular attachments. Discuss the ventral and dorsal auricular surfaces, ossification. Demonstrate the anatomical position Identify bony features of pubis and ischium. Describe the muscular, ligamentous, and capsular attachments. Correlate the clinical aspects Read relevant research article Use digital library 	Clinical Oriented Anatomy by Keith L. Moore.5TH Edition. (Page 510-516,526,328,329). https://www.youtube.com/watch?v=AeuLBN5ouwo https://link.springer.com/referenceworkentry/10.1007/978-3-030-43240-9_2
Femur	 Demonstrate the anatomical position of bone Demonstrate different parts Describe proximal and distal articulations State angle of femoral torsion. Demonstrate the anatomical position of bone Describe muscle attachment and ossification Discuss fractures with special reference to the fracture of neck of femur in old age. Correlate the clinical aspects Read relevant research article Use digital library 	Clinical Oriented Anatomy by Keith L. Moore.5TH Edition. (Page 20,435,510,516-518,527,659-660). https://www.youtube.com/watch?v=AeuLBN5ouwo https://link.springer.com/chapter/10.1007/978-981-13-8468-4_10
Anterolateral Compartment Of Thigh	 Describe the origin and insertion of muscles in anteriorlateral compartment of thigh. Describe the nerves and vessels of anterolateral compartment of thigh Discuss the femoral triangle and adductor canal with contents Identify these muscles. Correlate the clinical aspects Read relevant research article 	Clinical Oriented Anatomy by Keith L. Moore.5TH Edition. (Page 510, 545-548,557-558). https://www.youtube.com/watch?v=AeuLBN5ouwo https://link.springer.com/article/10.1186/s10195-023-00691-w

	Use digital library	
Medial Compartment Of Thigh	 Describe the muscles of medial compartment of thigh Discuss origin, insertion and nerve supply of medial compartment of thigh Describe the course relations and branches of obturator nerve. Correlate the clinical aspects Read relevant research article Use digital library 	Clinical Oriented Anatomy by Keith L. Moore.5TH Edition. (Page 548-551). https://www.youtube.com/watch?v=AeuLBN5ouwohttps://link.springer.com/article/10.1186/s10195-023-00691-w
Gluteal Region	 Tabulate the he various muscles of gluteal region with origin, insertion, action nerve supply. List various structures undercover of gluteal maximus i.e. muscles, vessels, nerves, bones and joints, ligaments, bursae. Describe trochancteric anastomosis and cruciate anastomosis. Enumerate the structures passing through greater sciatic foraman. Discuss the formation course relations, branches, distribution of sciatic nerve with applied anatomy Correlate the clinical aspects Read relevant research article Use digital library 	Clinical Oriented Anatomy by Keith L. Moore.5TH Edition. (Page 510, 562-563,575-583). https://www.youtube.com/watch?v=AeuLBN5ouwo https://link.springer.com/chapter/10.1007/978-3-030-11033-8_5
Posterior Compartment Of Thigh	 Tabulate the Hamstring muscles Discuss origin insertion, nerve supply and action Describe the nerves and vessels of posterior compartment of thigh Discuss course relations distribution and branches of neurovascular structures of posterior compartment Identify these structures Correlate the clinical aspects Read relevant research article Use digital library 	Clinical Oriented Anatomy by Keith L. Moore.5TH Edition. (Page 569-572). https://www.youtube.com/watch?v=AeuLBN5ouwo https://link.springer.com/article/10.1186/s10195-023-00691-w
Hip Joint	Describe the type of jointDescribe articular surfaces,	Clinical Oriented Anatomy by Keith L. Moore.5TH Edition. (Page 510-626,629-632,660-661).

	Describe capsular attachments.	https://www.youtube.com/watch?v=AeuLBN5ouwo
	 Discuss synovial membrane and its folding. 	Treatment of the country of the coun
	 Enlist ligaments and their attachments 	https://link.springer.com/referenceworkentry/10.1007/978-3-
	 Discuss movements possible at hip joint and muscles 	000 40040 0
	producing them	
	 Describe blood supply and nerve supply. 	
	 Correlate the clinical aspects 	
	Read relevant research article	
	Use digital library	
	Identify bone	Clinical Oriented Anatomy by Keith L. Moore.5TH Edition.
	Demonstrate its side.	(Page 19, 510,520-521,604).
		https://www.youtube.com/watch?v=AeuLBN5ouwo
		https://link.springer.com/chapter/10.1007/978-3-030-93685-
Tibia		3_14
	 Discuss attachment of muscle and ligament Describe articular surfaces 	
		https://link.springer.com/chapter/10.1007/978-3-319-78387-
	 Identify nutrient foramen Describe its ossification	1_69
	 Correlate the clinical aspects Read relevant research article 	
	Use digital library	Clinical Oriented Anatomy by Vaid I. Magna 5TH Edition
	• Identify bone	Clinical Oriented Anatomy by Keith L. Moore.5TH Edition. (Page 20,510,513,521,528,687,790).
	Demonstrate its side.	https://www.youtube.com/watch?v=AeuLBN5ouwo
	Demonstrate its normal anatomical position.	intps://www.youtube.com/watch?v=AeuLBiv3ouwo
Fibula	Describe bony features. Discribe bony features.	https://link.springer.com/chapter/10.1007/978-3-030-93685-
1 louiu	Discuss attachment of muscleS and ligamentS	3_14
	Describe articular surfaces	
	Identify nutrient foramen	https://link.springer.com/chapter/10.1007/978-3-319-78387-
	Describe its ossification	1 69
	Correlate the clinical aspects	
	Read relevant research article	
	Use digital library	

	Practicals			
Practical	At The End Of This Skill Lab, Student Should Be Able To Illustrate:	LearningDomain	Teaching Strategy	Assessment Tools
Skeletal muscle	 Identify muscle under microscope Illustrate microscopic structure of muscle Write two points of identification Focus the slide 	P C2 C1 P	Skill Lab	OSPE
Cardiac muscle Smooth muscle	 Identify muscles under microscope Illustrate microscopic structure of muscles Write two points of identification Focus the slide 	P C2 C1 P	Skill Lab	OSPE
Thick skin	 Identify thick skin under microscope Illustrate microscopic structure of thick skin Write two points of identification Focus the slide 	P C2 C1 P	Skill Lab	OSPE
Thin skin	 Identify thin skin under microscope Illustrate microscopic structure of thin skin Write two points of identification Focus the slide 	P C2 C1 P	Skill Lab	OSPE

	Physiology						
	Theory						
Topic		Learning Objectives	Learnin	Assessmen t Tool	References	Learning Resources	
		At The End Of Lecture Students Should Be Able To:	g Domain	t 1001			
Introduction muscle physiological Structure Sarcome	gy, of	Explain the physiologicanatomy of skeletal muscle Draw and label thesarcomere	C2	MCQ SAQ VIVA	 Ganong's Review of Medical Physiology.25TH Edition.Section 01,Excitable tissue:Muscle (Chapter 05,Page 99) Physiology by Linda S. Costanzo 6th Edition.Cellular Physiology (Chapter 1.Page 34) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.Muscle (Chapter 12,Page 411) Textbook of Medical Physiology by Guyton & Hall.14th Edition.Contraction of Skeletal muscle. 	 https://youtu.be/8iklTDlra5Q https://www.sciencedirect.com/science/article/abs/pii/0197018687901070 https://teachmephysiology.com/histology/tissuestructure/musclehistology/skeletal-muscle/ 	

				Section 02. (Chapter 06, Page 79)	
Sarcotubular system, excitation contraction coupling mechanism in skeletal muscle	Discuss the sliding filament model of muscle contraction. Describe the structure sarcotubular system and its importance in musclecontraction	C2 C2	MCQ SAQ VIVA	 Ganong's Review of Medical Physiology.25TH Edition.Section 01, Excitable tissue:Muscle (Chapter 05, Page 103) Physiology by Linda S. Costanzo 6th Edition.Cellular Physiology (Chapter 1. Page 36) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.Muscle (Chapter 12, Page 413,421) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 01, 	1. https://www.scie ncedirect.com/sc ience/article/abs/ pii/01970186879 01070 2. https://youtu.be/ 8iklTDlra5Q .https://link.spring er.com/article/10. 1007/s12551-013- 0135-x

				Excitation and Contraction of Skeletal muscle, (Chapter 04,page 68) Textbook of Medical Physiology by Guyton & Hall.14th Edition.Contraction of Skeletal muscle.Section 02. (Chapter 06, Page 81) (Chapter 07, Page 93,97)	
Molecular Mechanism of skeletal muscle contraction, Rigor mortis, Muscular dystrophies	Define motor unit Discuss recruitment and its effect on force of contraction Discuss Molecular Mechanism of skeletal muscle contraction	C1 C2	MCQ SAQ VIVA	 Physiology by Linda S. Costanzo 6th Edition.Cellular Physiology (Chapter 1. Page 36) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.Muscle (Chapter 12,Page 	1. https://youtu.be/RTnKBt2s Df0 2. https://youtu.be/NvV2xTrS hvg

				 413,421) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 01, Excitation and Contraction of Skeletal muscle, , (Chapter 04,page 70) Textbook of Medical Physiology by Guyton & Hall.14th Edition.Contraction of Skeletal muscle.Section 02. (Chapter 06, Page 82,88) 	
Length tension curve, Load and velocity of contraction, diseases of muscle	Draw and describe Length duration curve Load and velocity of contraction	C2	MCQ SAQ VIVA	 Physiology by Linda S. Costanzo 6th Edition.Cellular Physiology (Chapter 1. Page 39) Human Physiology by Dee Unglaub 	 https://www.urmc.rochester.edu/encyclopedia/content.aspx?ContentTypeID=85&ContentID=P00792 https://www.sciencedirect.com/topics/eng

				Silver thorn. 8TH Edition.Muscle (Chapter 12,Page 431,435) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 01, Excitation and Contraction of Skeletal muscle,, (Chapter 04,page 74) • Textbook of Medical Physiology by Guyton & Hall.14th Edition.Contracti on of Skeletal muscle.Section 02. (Chapter 06, Page 91)	ineering/lengt h-tension- curve
Energetics, efficiency and types of contraction, heat production in	Elaborate Energetic and efficiency of contraction. Discuss heat production in nerve and muscle	C3	MCQ SAQ VIVA	Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.Muscle	1. https://www.sciencedirect.cc om/topics/eng ineering/length-tension-curve

muscle			(Chapter 12,Page 431) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 01, Excitation and Contraction of Skeletal muscle, , (Chapter 04,page 77,84) • Textbook of Medical Physiology by Guyton & Hall.14th Edition.Contraction of Skeletal muscle.Section 02.	2. https://youtu.be/3ntulKD4k vY
			(Chapter 06, Page 85,87)	
Properties of skeletal muscles Tetanus & Fatigu	C2	MCQ SAQ VIVA	Ganong's Review of Medical Physiology.25TH Edition.Section 01,Excitable tissue:Muscle (Chapter 05, Page 110)	1. https://youtu.be/v5Nm_La_AQVo 2. https://www.sciencedirect.com/science/article/abs/pii/S23870206220

				 Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.Muscle (Chapter 12,Page 422,424,428) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 01, Excitation and Contraction of Skeletal muscle, (Chapter 04,page 74,86) 	03485
Introduction to CVS	Introduction to Cardiovascular system. Classify blood vessels	C1	MCQ SAQ VIVA	 Ganong's Review of Medical Physiology.25TH Edition.Section 05,Cardioascular physiology (Chapter 29, Page 519) Human Physiology by Dee Unglaub Silver thorn. 	1. https://youtu.be/28CYhgjrBLA 2. https://litfl.com/cardiovascular-physiology-overview/

				8TH Edition. Cardioasc ular physiolog y (Chapter 14,Page 469) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 02, Introduction to Cardiovascular system.(Chapter 05,page 101)	
Physiologic anatomy, types and properties of Smooth Muscle	Enlist type of smooth muscles and explain their characteristics Explain the properties of smooth muscle	C1 C2	MCQ SAQ VIVA	 Physiology by Linda S. Costanzo 6th Edition.Cellular Physiology (Chapter 1. Page 40) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.Muscle (Chapter 	 https://www.k enhub.com/en /library/anato my/smooth- musculature https://youtu. be/qEVRoKu oj4U

Introduction to pericardium Properties of myocardium & endocardium, myocardial action potential	Describe the physiologic anatomy of myocardium Discuss properties of myocardium Discuss in detail various properties of myocardium Describe the mechanism of production of action potential and its propagation Describe excitation contraction coupling in detail Discuss propagation of electrical activity in cardiac muscle	C1 C2 C1 C2	MCQ SAQ VIVA	 Textbook of Medical Physiology by Guyton & Hall.14th Edition.Excitation and Contraction of Smooth muscle.Section 02. (Chapter 08, Page 101) Physiology by Linda S. Costanzo 6th Edition.Cardiova scular Physiology (Chapter 14. Page 131) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.Muscle (Chapter 12,Page 482) Textbook of Medical 	1. https://youtu.be/L2Gf9cj7jBw 2. https://www.sciencedirect.com/topics/medicine-and-dentistry/cardiac-action-potential
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				Physiology by Guyton & Hall.14th Edition. (Chapter 09, Page 114)	
Mechanism of smooth muscle contraction & its control	Explain the chemical and physical basis of smooth muscle contraction	C2	MCQ SAQ VIVA	 Ganong's Review of Medica Physiology by Linda S. Costanzo 6th Edition.Cellular Physiology (Chapter 1. Page 42) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.Muscle (Chapter 12,Page 439,443) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Excitation and Contraction of Smooth muscle.Section 02. 	1. https://www.k enhub.com/en /library/anato my/smooth- musculature 2. https://youtu.be/qEVRoKuoj4U

Regulation of	Describe the regulation of pumping activity of heart	C1	MCQ	(Chapter 08, Page 103,105) • Textbook of Medical Physiology by	1. https://pubmed.ncbi.nlm.ni h.gov/166182
myocardial activity			SAQ VIVA	Guyton & Hall.14th Edition. Excitation and Contraction of Smooth muscle.Section 02. (Chapter 09, Page 123)	2. https://www.s ciencedirect.c om/topics/me dicine-and- dentistry/card iac-action- potential
Comparison of 3 types of muscle	Discuss differences among three types of muscle in detail	C2	MCQ SAQ VIVA	Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.Muscle (Chapter 12,Page 444)	1. https://training.seer.cancer.gov/anatomy/muscular/types.html 2. https://youtu.be/eShBZ3-RxHA
Excitatory & Conducting system of heart	 Describe the conductive system of heart in detail Enlist the various components of conductive system of heart Describe the mechanism of production of action potential in SA node, AV node, ventricles. also describe its propogation 	C1 C1	MCQ SAQ VIVA	Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.Muscle (Chapter	3. https://youtu.be/TnFoJ7Hh i-M 4. https://teachm eanatomy.info /thorax/organ s/heart/condu cting-system/

	 12,Page 488) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 08,page 155,162)
	• Textbook of Medical Physiology by Guyton & Hall.14th Edition.Section 02. (Chapter 10, Page 127,133)

Topic	Learning Objectives Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tools
	• Discuss the sliding filament model of muscle contraction.	C2		MCQ
Sliding filaments of skeletal muscle, sarcotubular system	Describe the structure sarcotubular system and its importance in muscle contraction	C1	SGD	SAQ VIVA
	Enlist type of smooth muscles and explain their characteristics	C1		MCQ SAQ
Physiology of smooth muscle, mechanism of smooth muscle contraction	Discuss the properties of smooth muscle	C2	SGD	VIVA
Properties of myocardium,	• Describe the physiologic anatomy of myocardium Discuss properties of myocardium.	C1		MCQ
myocardial action potential, Excitatory and	• Discuss in detail various properties of myocardium Describe the mechanism of production of action potential and its propagation.	C2	LGIS	SAQ VIVA
conduction system of heart	Describe excitation contraction coupling in detail	C1		

	Discuss propagation of electrical activity in cardiac muscle	C2		
Comparison of three	Discuss three types of muscles	C2		MCQ
types of muscle	Discuss differences among three types of muscle in detail	C2	LGIS	SAQ VIVA

Topics Of SDL	Learning Objective	References	Learning Resources
SDL (On Campus): Sarcotubular system, excitation contraction coupling mechanism in skeletal muscle	Discuss the sliding filament model of muscle contraction Describe the structure sarcotubular systemand its importance in muscle contraction	 Ganong's Review of Medical Physiology.25TH Edition.Section 01,Excitable tissue:Muscle (Chapter 05, Page 103) Physiology by Linda S. Costanzo 6th Edition.Cellular Physiology (Chapter 1. Page 36) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.Muscle (Chapter 12,Page 413,421) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 01, Excitation and Contraction of Skeletal muscle, (Chapter 04,page 68) Textbook of Medical Physiology by Guyton & Hall.14th Edition.Contraction of Skeletal muscle.Section 02. (Chapter 06,Page 81) (Chapter 07, Page 93,97) 	 https://www.sciencedirect.com/science/article/abs/pii/0197018687901070 https://youtu.be/8iklTDlra5Q https://link.springer.com/article/10.10/07/s12551-013-0135-x

Molecular Mechanism of skeletal muscle contraction, Rigor Molecular Mechanism of skeletal muscle contraction, Rigor mortis, Muscular dystrophies	Define motor unit Discuss recruitment and its effect on force of contraction Define motor unit Discuss recruitment and its effect on force of contraction Discuss Molecular Mechanism of skeletal muscle contraction	 Physiology by Linda S. Costanzo 6th Edition.Cellular Physiology (Chapter 1. Page 36) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.Muscle (Chapter 12,Page 413,421) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 01, Excitation and Contraction of Skeletal muscle, (Chapter 04,page 68) Textbook of Medical Physiology by Guyton & Hall.14th Edition.Contraction of Skeletal muscle.Section 02. (Chapter 06, Page 81) (Chapter 07, Page 93,97) Physiology by Linda S. Costanzo 6th Edition.Cellular Physiology (Chapter 1. Page 36) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.Muscle (Chapter 12,Page 413,421) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 01, Excitation and Contraction of Skeletal muscle, , (Chapter 04,page 70) Textbook of Medical Physiology by Guyton & Hall.14th Edition.Contraction of Skeletal muscle.Section 02. (Chapter 	 https://youtu.be/RTnKBt2sDf0 https://youtu.be/NvV2xTrShvg https://youtu.be/RTnKBt2sDf0 https://youtu.be/NvV2xTrShvg
Length tension curve, Load and velocity of contraction, diseases of muscle	Draw and describe Length duration curve Load and velocity of	 O6, Page 82,88) Physiology by Linda S. Costanzo 6th Edition.Cellular Physiology (Chapter 1. Page 39) 	https://www.urmc.rochester.edu/ency clopedia/content.aspx?ContentTypeI D=85&ContentID=P00792 https://www.sciencedirect.com/topics/

	contraction	 Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.Muscle (Chapter 12,Page 431,435) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 01, Excitation and Contraction of Skeletal muscle, (Chapter 04,page 74) 	engineering/length-tension-curve
		Textbook of Medical Physiology by Guyton & Hall.14th Edition.Contraction of Skeletal muscle.Section 02. (Chapter 06, Page 91)	
Energetics, efficiency and types of contraction, heat production in muscle	Elaborate Energetic and efficiency of contraction. Discuss heat production in nerve and muscle	 Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.Muscle (Chapter 12,Page 431) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 01, Excitation and Contraction of Skeletal muscle, (Chapter 04,page 77,84) Textbook of Medical Physiology by Guyton & Hall.14th Edition.Contraction of Skeletal muscle.Section 02. (Chapter 06, Page 85,87) 	 https://www.sciencedirect.com/topics/ engineering/length-tension-curve https://youtu.be/3ntulKD4kvY
Properties of skeletal muscles, Tetanus & Fatigue	Discuss various properties of skeletal muscle in detail Tetanus and fatigue	 Ganong's Review of Medical Physiology.25TH Edition.Section 01,Excitable tissue:Muscle (Chapter 05, Page 110) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.Muscle (Chapter 12,Page 422,424,428) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 01, Excitation and Contraction of Skeletal 	https://youtu.be/v5Nm_LaAQVo https://www.sciencedirect.com/science/aricle/abs/pii/S2387020622003485

		muscle, (Chapter 04,page 74,86)	
Introduction to CVS	Introduction to Cardiovascular system. Classify blood vessels	 Ganong's Review of Medical Physiology.25TH Edition.Section 05,Cardioascular physiology (Chapter 29, Page 519) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. Cardioascular physiology (Chapter 14,Page 469) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 02, Introduction to Cardiovascular system.(Chapter 05,page 101) 	 https://youtu.be/28CYhgjrBLA https://litfl.com/cardiovascular-physiology-overview/
Physiologic anatomy, types and properties of Smooth Muscle	Enlist type of smooth muscles and explain their characteristics Explain the properties of smooth muscle	 Physiology by Linda S. Costanzo 6th Edition.Cellular Physiology (Chapter 1. Page 40) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.Muscle (Chapter 12,Page 436) Textbook of Medical Physiology by Guyton & Hall.14th Edition.Excitation and Contraction of Smooth muscle.Section 02. (Chapter 08, Page 101) 	 https://www.kenhub.com/en/library/a natomy/smooth-musculature https://youtu.be/qEVRoKuoj4U
Introduction to pericardium Properties of myocardium & endocardium, myocardial action potential	Describe the physiologic anatomy of myocardium Discuss properties of myocardium Discuss in detail	 Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 14. Page 131) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.Muscle (Chapter 12,Page 482) 	 https://youtu.be/L2Gf9cj7jBw https://www.sciencedirect.com/topic s/medicine-and-dentistry/cardiac- action-potential

Mechanism of smooth muscle contraction & its control	various properties of myocardium Describe the mechanism of production of action potential and its propagation Describe excitation contraction coupling in detail Discuss propagation of electrical activity in cardiac muscle Explain the chemical and physical basis of smooth muscle contraction	 Textbook of Medical Physiology by Guyton & Hall.14th Edition. (Chapter 09, Page 114) Ganong's Review of Medica Physiology by Linda S. Costanzo 6th Edition.Cellular Physiology (Chapter 1. Page 42) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.Muscle (Chapter 12,Page 439,443) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Excitation and Contraction of Smooth muscle.Section 02. (Chapter 08, Page 103,105) 	 https://www.kenhub.com/en/library/ anatomy/smooth-musculature https://youtu.be/qEVRoKuoj4U
Regulation of myocardial activity	Describe the regulation of pumping activity of heart	Textbook of Medical Physiology by Guyton & Hall.14th Edition. Excitation and Contraction of Smooth muscle.Section 02. (Chapter 09, Page 123)	 https://pubmed.ncbi.nlm.nih.gov/166 1829/ https://www.sciencedirect.com/topic s/medicine-and-dentistry/cardiac- action-potential
Comparison of 3 types of muscle	• Discuss differences among three types of muscle in detail	Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.Muscle (Chapter 12,Page 444)	 https://training.seer.cancer.gov/anatomy/muscular/types.html https://youtu.be/eShBZ3-RxHA
Excitatory & Conducting system of heart	• Describe the conductive system	Human Physiology by Dee Unglaub	 https://youtu.be/TnFoJ7Hhi-M https://teachmeanatomy.info/thorax/

of heart in detail • Enlist the various components of conductive system of heart • Describe the mechanism of production of action potential in SA node, AV node, ventricles.also describe its	 Silver thorn. 8TH Edition.Muscle (Chapter 12,Page 488) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 08,page 155,162) Textbook of Medical Physiology by Guyton & Hall.14th Edition.Section 02. (Chapter 10, Page 127,133) 	organs/heart/conducting-system/
propogation		

		Practicals				
	Practical	At The End Of This Skill Lab,	Learning	Teaching	Assessment	References
		Student Should Be Able To	Domain	Strategy	Tools	
		Illustrate:	P			
	_	Apparatus identification			OSPE	
	· · · · · · · · · · · · · · · · · · ·	• Principle	C1		OSIL	
De	etermination of RBC count	• Procedure	C1	Skill Lab		Practical Notebook
		 Recall composition of Diluents 	C1			of Physiology
		 Comprehend 				Second year MBBS
		• Calculation on hemocytometer	C3			by Dr Saqib Sohail
		Recall Normal values	C1			
		Apparatus identification	P		OSPE	
	Determinati on of TLC	Principle	C1	Skill Lab		Practical Notebook
		• Procedure	C1			of Physiology
		Recall composition of Diluents	C1			Second year MBBS
		Comprehend Calculation on	C2			by Dr Saqib Sohail
		hemocytometer	C1			
		 Recall Normal values 				
		 Apparatus identification 	P		OSPE	
		 Principle 	C1	Skill Lab		

Determination of Platelet	Procedure	C1			
Count	Recall composition of Diluents	C1			Practical Notebook
	Comprehend, Calculation on hemocytometer	C2			of Physiology Second year MBBS by Dr Saqib Sohail
	Recall Normal values	C1			by Di Saqio Sonan
	Principle	C1		OSPE	
Determination of ABO,	• Procedure	C1	Skill Lab		Practical Notebook
Bloodgroups	• Methods	C1			of Physiology
Bioodgioups	 Types of blood groups 	C2			Second year MBBS
	 Clinical Corelations of blood 	C3			by Dr Saqib Sohail
	transfusion				

Biochemistry							
Theory							
	Topic	Learning Objectives	Learning	Teaching	Assessment Tool		
		At the end of lecture students should be able to	Domain	Strategy			
		Protein chemistry					
		Describe amphoteric properties of amino acids	C2				
I	Properties of amino acids&	Discuss Post transitional amino acids and		LGIS	MCQs,		
	Important peptides	location of amino acids in proteins	C2		SAQs &		
		Explain Important peptides	C2		Viva		
		Discuss Importance of proteins	C1		MCQs,		
	Proteins	Classify proteins	C2	LGIS	SAQs &		
		Describe Functions of proteins	C2		Viva		
P	Primary structure of proteins	Describe Primary structure of protein	C2		MCQs,		
		Discuss Peptide bond	C2	LGIS	SAQs &		
					Viva		

	Enlist Types of secondary structure.	C1		MCQs,
Secondary structure of	Describe Secondary structure of proteins.	C2	LGIS	SAQs &
proteins	Elaborate Significance of secondary structure	C2		Viva
	Describe Tertiary and quaternary structure of	C2		MCQs,
Tertiary and quaternary	proteins	C2	LGIS	SAQs &
structure	• Understand the forces stabilizing protein structure			Viva
	Discuss Folding of proteins	C2		
	Describe protein misfolding	C2	LGIS	MCQs,
Protein folding	Interpret the clinical cases related to protein	C3		SAQs &
And denaturation	misfolding	C2		Viva
	Discuss denaturation of proteins			
	Describe structure of collagen and elastin	C2		
	Discuss differences between collagen and elastin	C2		
Collagen and Elastin	Explain Synthesis of collagen	C2	LGIS	MCQs,
	Enlist Factor regulating and helping in			SAQs &
	strengthening of collagen	C 1		Viva
	• Interpret defects of collagen synthesis and elastin	C3		
Techniques for separation of	Describe Techniques for separation of proteins			MCQs,
proteins		C2	LGIS	SAQs &
				Viva

Topic	Learning Objectives At The End of Tutorial Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Protein structure	• Explain primary, secondary, tertiary and quaternary structures of proteins	C2	SGD	MCQs & SAQs
Collagen	Discuss structure of collagenDescribe synthesis of collagenInterpret related clinical disorders	C2 C2 C3	SGD	MCQs & SAQs

Topic	Learning Objectives		References
	At the end of lecture students should be able to		
	Protein chemistry		
Properties of amino acids& Important peptides	 Describe amphoteric properties of amino acids Discuss Post transitional amino acids and location of amino acids in proteins Explain Important peptides 	•	Textbook of Mushtaq 8 th Eidtion Chapter No. 4 pg 97
Proteins	Discuss Importance of proteinsClassify proteinsDescribe Functions of proteins	•	Textbook of Mushtaq 8 th Eidtion Chapter No. 4 pg 97, 98
Primary structure of proteins	Describe Primary structure of proteinDiscuss Peptide bond	•	Textbook of Lippincott 8 th Eidtion Chapter No. 2 pg 14
Secondary structure of proteins	 Enlist Types of secondary structure. Describe Secondary structure of proteins. Elaborate Significance of secondary structure 	•	Textbook of Lippincott 8 th Eidtion Chapter No. 2 pg 16
Tertiary and quaternary structure	 Describe Tertiary and quaternary structure of proteins Understand the forces stabilizing protein structure 	•	Textbook of Lippincott 8 th Eidtion Chapter No. 2 pg 19
Protein folding And denaturation	 Discuss Folding of proteins Describe protein misfolding Interpret the clinical cases related to protein misfolding Discuss denaturation of proteins 	•	Textbook of Lippincott 8 th Eidtion Chapter No. 2 pg 20, 21

Collagen and Elastin	 Describe structure of collagen and elastin Discuss differences between collagen and elastin Explain Synthesis of collagen Enlist Factor regulating and helping in strengthening of collagen Interpret defects of collagen synthesis and elastin 	Textbook of Lippincott 8 th Eidtion Chapter No. 4 pg 45,97
Techniques for separation	Describe Techniques for separation of proteins	Textbook of Mushtaq 8 th Eidtion Chapter No. 4 pg 104
of proteins		

Topic	Learning Objectives	Learning Domain	Teaching Strategy	Assessment Tool
	At The End Of Practical Students Should Be			
	Able To			
Color tests for detection of proteins	Perform the color tests	P	Skill Lab	OSPE
Detection of proteins by Isoelectric pH	Detect proteins by isoelectric pH	Р	Skill Lab	OSPE
Fractional precipitation of proteins	Detect proteins by precipitation reactions (precipitation by full and half saturation with ammonium sulphate)	P	Skill Lab	OSPE
Chromatography	Separate proteins by Chromatography	P	Skill Lab	OSPE

Basic and Clinical Sciences (Vertical Integration)

Anatomy, Physiology & Biochemistry Clinical Themes					
A	anatomy	Traumatic Hip dislocation	Apply basic knowledge of subject to study clinical case.	C3	
		Fracture Of Neck Of Femur	Apply basic knowledge of subject to study clinical case.	C3	
Ph	nysiology	Weight Training	Apply basic knowledge of subject to study clinical case.	C3	
Dischemister		Marfan Syndrome	Apply basic knowledge of subject to study clinical case.	C3	
Вю	ochemistry	Collagen deficiency	Apply basic knowledge of subject to study clinical case.	C3	

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

	Orthopedics			
	Theory			
Topic	At The End Of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
	Understand the anatomical and biomechanical principles underlying			

	fractures of the lower limb.			
Fractures of Lower Limb	Identify and classify fractures of the lower limb through clinical assessment and radiographic interpretation	C2	LGIS	MCQs

List of MSK-II Module Vertical Courses Lectures							
Date/Day	Week	Department	Time	Topic Of Lectures	Teachers Name & Contact #		
Thursday 30-05-2024	1 st	Radiology	10:20 AM – 11:20 AM	X rays of Hip Bone			
Tuesday 25-06-2024	5 th	Orthopedics	10:30 AM – 11:20 AM	Fractures of Lower Limb			

Spirally Integrated Courses / General Education Cluster (GEC) Courses

Content

- Longitudinal Themes
 - o The Holy Quran Translation
 - Seerat Mubarak
 - o Biomedical Ethics & Professionalism
 - o Family Medicine
 - o Artificial Intelligence (Innovation)
 - o Early Clinical Exposure (ECE)

	The Holy Quran Translation Lecture Theory						
	Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain	Teaching Strategy	Assessment Tool		
	Imaniat	 Describe the Concept of Tauheed Explain the attributes of pious. Discuss the attributes of Allah Almighty Explain Hazarat Uzair's and Hazarat Ibrahim's experience about resurrection 	C2	LGIS	SAQ		
	Ibadat	Understand the concept of worship, mastering ritual acts, fostering a spiritual connection.	C2	LGIS	SAQ		

Seerat Mubarak					
	Theory				
Importance of Hadees and Sunna	 Discuss the meaning of Hadith and Sunnah Describe the importance of Hadees and Sunnah 	C2	LGIS	SAQ	

Family Medicine				
	Theory			
Topic	At The End Of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool

Communication Skills	To be able to communicate with the patients keeping mind the principle of communication skills	C2	LGIS	MCQS

	Artificial Intelligence (Innovation)			
	Theory			
Topic	Learning Objectives	Learning	Teaching	Assessment Tool
	At the end of the lecture the student should be able to	Domain	Strategy	
Introduction to Artificial Intelligence	• Understand the fundamental concepts and applications of Artificial Intelligence (AI) in healthcare, including medical image analysis, disease prediction, and personalized treatment recommendations.	C2	LGIS	MCQS
	• Demonstrate the ability to critically evaluate AI algorithms and their ethical implications in medical decision-making, patient care, and privacy.			

	Biomedical Ethics & Professionalism							
	Practical Session							
Discussion will cover; Introduction to Professional Ethics PM&DC Code of Conduct Purpose of medical code of conduct Regulatory body PM&DC covering following subtopics What Is the 'Professional Eth Code of Conduct'? Why to Have the Code of Conduct? Who Needs to Follow the Code Conduct? Who is it for?	• Cognizant with need for professional code of conduct by PM&DC.C1 • Elaborate the purpose and relevance for medical code of conduct at undergraduate level . C2	LGIS 1hr contact session in 2-4 parallel classes conducted by Senior faculty	1 MCQs of level C1 to C3 will cover this session teachings in relevant block examination in pool of total 04 MCQs. Result / marks obtained will contribute towards Internal assessment (IA) in 1st Prof. MBBS exam.	PMDC Code of Ethics: http://www.pmdc.o rg.pk/LinkClick.as px?fileticket=v5W mQYMvhz4%3D &tabid=102∣= 554				

What Are the Code of Conduct Requirements? Discussion on Health Research ethics focusing; •Historical perspective of Tuskegee studies, Willow brook Experiment •Codes of medical ethics: traditional foundations and contemporary practice •Nuremburg code, Belmont report, Declaration of Helsinki and importance of historical background of ethics in current research trends • General ethical principles including explanation of 04 basic principles of Beneficence, non-maleficence, respect and justice. - Interpretation research ethics for; - Informed consent and confidentiality in research HR	At the end of the session students should be able to; • Explain the meaning of the term "ethics".C1 • Describe the historical perspective of global development of medical ethics. C1 • Describe the codes of medical ethics and their implications.C1 • Recognize ethical issues relevant to the case situation and apply the ethical codes as appropriate. C2 • Discuss the development of indigenous ethical codes in the South-East Asian Region. C2. • Demonstrate sensitivity to cultural diversity in medical care.C3	LGIS 1hr contact session in 2-4 parallel classes, Conducted by Senior faculty.	1 MCQs of level C1 to C3 will cover this session teachings in relevant block examination in pool of total 04 MCQs. Result / marks obtained will contribute towards Internal assessment (IA) in 1st Prof. MBBS exam.	Guidelines and Teachers Handbook for Introducing Bioethics to Medical and Dental Students http://nbcpakistan. org.pk/assets/may- 16-bioethics- facilitator-book may-16%2C- 2017.pdf The Nuremberg Code: http://www.hhs.go v/ohrp/archive/nur code.html 10 WMA Declaration of Helsinki: http://www.wma.n et/en/30publication s/10policies/b3/ CIOMS Guidelines: http://www.cioms.
	• Demonstrate sensitivity to			et/en/30publication s/10policies/b3/ CIOMS Guidelines:

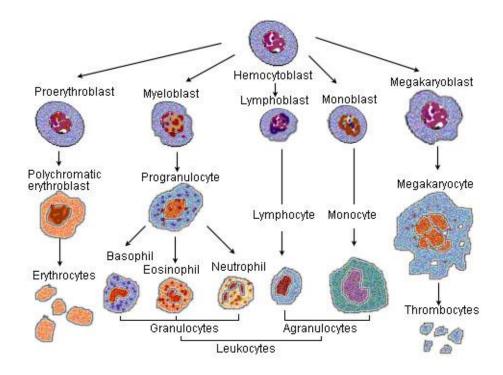
Laboratory Ethics	Discussion will cover basic elements of Laboratory Ethics focusing; • Importance of medical professionalism for the medical student; including respect and gratitude towards colleagues • Code of conduct: Collaboration, partnership, Teamwork, Maintaining dress code, religion obligations of medical doctor, focus on physicians' character, virtues and duties • Delineate the ethical consideration while	At the end of the session students should be able to; • Understand the importance of taking permission before performing procedures (drawing blood, administering injections etc.) during laboratory sessions .A1 • Show Respects other health professional team members and complete assigned task in professional manner.A1	Case based discussion in 2 hr contact session in 4-6 parallel classes conducted by faculty of respective departments Role plays Reflective writing	Assignment based assessment under aggregate Marks (Internal Assessment) Assignment to be uploaded on LMS	g/news/nuffield.sht ml - Real life scenarios in form of Case base learning /problem based learning (PBL) To be share with students one week before the session Introduction to criteria for assessment of
		1	Reflective writing		

Behavioural Sciences						
	Theory					
Topic	At The End Of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool		
Rights and Responsibilities of patients and doctors	To be able to identify and differentiate own rights and rights of the patients.	C2	LGIS CBL	MCQS		
	> To apply this knowledge in clinical settings	C2				

List of MSK-II Module Spiral Courses Lectures						
Date/Day	Week	Department	Time	Topic Of Lectures	Teachers Name & Contact #	
Friday 31-05-2024	1 st	Seerat Mubarak	09:00 AM – 10:00 AM	Importance of Hadees and Sunnah	Molana Abdul Waahid (0341-5444667)	
Friday 31-05-2024	1 st	Family Medicine	11:00 AM – 12:00 PM	Communication and consultation skills in Family Medicine Practice	Dr. Sadia Azam Khan	
Friday 07-06-2024	2 nd	Quran Translation	11:00 AM – 12:00 PM	Imaniat-I, Ibadat-II	Molana Abdul Waahid (0341-5444667) Mufti Naeem Sherazi (0300-5580299)	
Friday 14-06-2024	3 rd	Quran Translation	10:00 AM – 11:00 AM	Imaniat -I , Ibadat-II	Mufti Naeem Sherazi (0300-5580299) Molana Abdul Waahid (0341-5444667)	
Thursday 20-06-2024	4 th	Behavioral Sciences	11:20 AM – 12:10 PM	Communication Skills	Dr. Arsalan Manzoor	
Friday 21-06-2024	4 th	Quran Translation	09:00 AM – 10:00 AM	Ibadat-III Immaniat-II	Molana Abdul Waahid (0341-5444667) Mufti Naeem Sherazi (0300-5580299)	
Friday 21-06-2024	4 th	Quran Translation	10:00 AM – 11:00 AM	Ibadat-IV, Immaniat-III	Mufti Naeem Sherazi (0300-5580299) Molana Abdul Waahid (0341-5444667)	
Saturday 22-06-2024	4 th	Biomedical Ethics	11:20 AM – 12:10 PM	Introduction to Professional Ethics and PM&DC Code of Conduct	Dr. Aneela (Even) Dr. Kashif (Odd)	
Monday 24-06-2024	5 th	Artificial Intelligence	10:30 AM – 11:20 AM	Introduction to Artificial Intelligence	Prof. Dr. Riaz Ahmed	
Tuesday 25-06-2024	5 th	Behavioral Sciences	09:00 AM – 10:10 AM	Rights and responsibilities of patients and doctors		
Tuesday 26-06-2024	5 th	Biomedical Ethics	11:20 AM – 12:10 PM	History of Medical Ethics	Dr. Arsalan Even Dr. Maria Odd	

Block-II Module No. 4 - Blood & Immunity

Duration 5 Weeks



Blood and Immunity Module Team

Module Name : Blood and Immunity Module

Dr. Sadia Khan

Duration of module : 05 Weeks
Coordinator : Dr. Rahat

Lectures

Focal Person Family Medicine

Co-coordinator : Dr. Kamil Tahir Reviewed by : Module Committee

	Module Comr	nittee	Module Task Force Team			
1.	Vice Chancellor RMU	Prof. Dr. Muhammad Umar	1. Coordinator	Dr. Rahat (APWMO of Biochemistry)		
2.	Chairperson Anatomy & Dean Basic Sciences	Prof. Dr. Ayesha Yousaf	2. DME Focal Person	Dr. Farzana Fatima		
3.	Director DME	Prof. Dr. Ifra Saeed	3. Co-coordinator	Dr. Ali Raza (Senior Demonstrator of Anatomy)		
4.	Chairperson Physiology	Prof. Dr. Samia Sarwar	4. Co-Coordinator	Dr. Uzma Zafar (APWMO of Biochemistry)		
5.	Chairperson Biochemistry	Dr. Aneela Jamil	5. Co-coordinator	Dr. Kamil Tahir (Senior Demonstrator Physiology)		
6.	Focal Person Anatomy First Year MBBS	Asso. Prof. Dr. Mohtashim Hina				
7.	Focal Person Physiology	Dr. Sidra Hamid	DN	IE Implementation Team		
			1. Director DME	Prof. Dr. Ifra Saeed		
8.	E 1D D' 1 '	To	2. Assistant Director DME	D E E C		
o.	Focal Person Biochemistry	Dr. Aneela Jamil	2. Assistant Director Divid	Dr. Farzana Fatima		
9.	Focal Person Biochemistry Focal Person Pharmacology	Dr. Aneela Jamil Dr. Zunera Hakim	3. Implementation Incharge 1st & 2 nd	Prof. Dr. Ifra Saeed		
	· · · · · · · · · · · · · · · · · · ·					
	· · · · · · · · · · · · · · · · · · ·		3. Implementation Incharge 1st & 2 nd	Prof. Dr. Ifra Saeed		
	· · · · · · · · · · · · · · · · · · ·		3. Implementation Incharge 1st & 2 nd	Prof. Dr. Ifra Saeed Dr. Farzana Fatima		
9.	Focal Person Pharmacology	Dr. Zunera Hakim	3. Implementation Incharge 1st & 2 nd Year MBBS	Prof. Dr. Ifra Saeed Dr. Farzana Fatima Dr. Saira Aijaz		
9.	Focal Person Pharmacology Focal Person Pathology	Dr. Zunera Hakim Dr. Asiya Niazi	3. Implementation Incharge 1st & 2 nd Year MBBS	Prof. Dr. Ifra Saeed Dr. Farzana Fatima Dr. Saira Aijaz		

			Themes			
Block	Subjects	Embryology	Histology	Gross Anatomy	CBL	SDL
	• Anatomy	 Development of pharyngeal arches Development of spleen Development of thymus 	SpleenThymusLymph nodesTonsils	Posterior compartment of leg to foot	Ankle sprainFlat foot	 Posterior compartment of leg and flexor retinaculum Neurovascular organization of posterior compartment of leg Foot joints Ankle joints Sole of foot Spleen Gait cycle
II	• Physiology	 Fate of RBCs & Jau Types of immunity, Physiology of acquired Physiology of acquired Composition of blood WBCs classification Platelet formation & Blood coagulation Concept of intravasor thrombocytopenia Thromboembolic correspond of blood clotting out Physiological mechanics Role of Hypothalam 	anoglobinopathies, Iros R & Red cell indices of the Physiology of innatered immunity B-Cell red immunity T-Cell of & Hemopoiesis a & formation. Neutration to the Physiology of innatered immunity T-Cell of & Hemopoiesis a & formation. Neutration to the Market function of the Market function (DVT, Pulmerside the body) anism of temperature us in temperature regulation (Few rouping system system and Erythrobin teards	m Metabolism es, Anemia & polycythe e immunity tolerance & es. Allergy and Hyperse ophils, Eosinophils & E es, blood coagulation tes and bleeding disorders (conary Embolism, DIC) regulation gulation er, Heat stroke, Exposu	auto immunity Institutity reactions, A Basophils and their p Sts (BT, CT, PT, AP (Vit K deficiency, he Anticoagulant thera)	Auto-immune diseases and AIDS roperties TT and INR emophilia and py (Heparin, warfarin, Prevention
	Biochemistry	Heme synthesis				
	• Biochemistry	Heme synthesis				

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

	Lymphadenopathy
 Pediatrics 	Neonatal Jaundice
	ABO/ Rh Incompatibility
	Lymphadenopathy/ Hepatosplenomegaly
Pathology Laboratory	Identification of Slides of Spherocytosis
	Microcytosis
	• Leukocytosis
	Lymph node
	Bone Marrow
	Clinical Relevance

Anemia

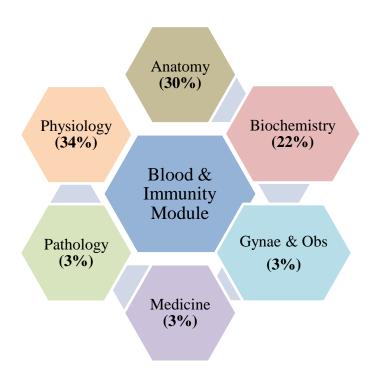
- Thalassemia
- Pathophysiology of Iron Deficiency Anemia
- Sickle Cell Anemia: Clinical Manifestations and Diagnosis
- Hemophilia: Presentation and Emergency Management
- Disseminated Intravascular Coagulation (DIC): Pathology and Clinical Importance
- Mechanisms of Autoimmune Diseases (e.g., Systemic Lupus Erythematosus)
- Clinical Features of Acute Leukemia
- Blood Transfusion Reactions and Their Management
- Diagnosis and Management of Thrombocytopenia

• Hypersensitivity Reactions (e.g., anaphylaxis) Immunodeficiency Disorders (e.g., HIV/AIDS and SCID)

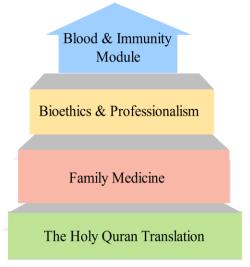
Implementation of Terms of Reference (TORS)

- Total hours of teaching, learning and formative/summative internal assessment to be completed in a year are predefined as per the guidelines of PMDC and to be strictly followed.
- The hours mentioned within each module are the mandatory minimum required.
- The content and the intended learning outcomes written are mandatory, to be taught, at the level required, as the end year assessment will be based on these. However, the level of cognition can be kept at a higher level.
- The Table of Specifications provided will be used for the three papers of the first professional examination.
- The same table of specifications should be used for the respective block exams for internal assessment.
- The criteria defined for continuous internal assessment is to be followed for each module and block respectively

Integration of Disciplines in Blood & Immunity Module



Spiral / General Education Cluster Courses (5%)



Module No. 4 - Blood and Immunity

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!



Syllabus of Blood & Immunity (Module No. 4)

	Anatomy			
	Theory			
Topic	At the End of The Session Students Should Be Able To:	Learning	Teaching	Assessment Tools
		Domain	Strategy	
	Classify lymphoid tissue	C2		
	Define diffuse lymphoid tissue, nodular lymphoid tissue and lymphoid organs	C1		
(Histology)	Discuss the histological features of lymph node	C2		MCQ
Lymph node	Enlist functions of lymph node	C1	LGIS	SAQ
• •	Understand the supporting elements of lymph node	C2		VIVA
	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		
	Describe the location and functions of thymus	C1		
(Histology)	Enumerate different types of reticuloepithelial cells	C1	_	
Thymus & Tonsil	Describe microscopic structure of thymus	C2		
	Compare the histological structure of thymus and other lymphoid organs	C2		MCQ

	Discuss blood thymus barrier	C2	LGIS	SAQ
	Describe general histological structure of tonsils	C2		VIVA
	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		
	Describe the location and functions of spleen	C2		
	Describe microscopic structure of spleen	C2		
(Histology)	Differentiate between red and white pulp of spleen	C2		MCQ
Spleen	Discuss blood circulation through spleen	C2	LGIS	SAQ
	Discuss the clinical correlation of spleen	C3		VIVA
	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		
	Define pharyngeal arches and pouches	C1		
(Embryology)	Discuss the components of pharyngeal arches and pouches	C2		MCQ
Development of Pharyngeal arches & pouches	Describe the development and fate of each pharyngeal arch and pouches	C2	LGIS	SAQ VIVA
pouches	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	

Topic	At the End Of The Session Students Should Be Able To:	Learning Domains	Teaching Strategy	Assessment Tools
	Illustrate cutaneous innervation	C2		
	Describe superficial fascia & deep fascia.	C2		
Posterior Compartment of	Discuss superficial and deep muscle groups in posterior compartment	C2		MCQ
Leg (muscles) and flexor retinaculum	Tabulate origin, insertion, nerve supply and action of all muscles of posterior compartment of leg	C2	SGD, Skill Lab	SAQ VIVA
	Discuss ruputured calcaneal tendon, calcaneal bursitis and accessory soleus muscle	C3		OSPE
	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	Describe origin, course relations, branches and tributaries of neurovascular bundle	C2		MCQ
Leg	Discuss superficial veins i.e long and short saphenous veins	C2	SGD,	SAQ
(Neurovascular	Palpate the posterior tibial pulse	C3	Skill Lab	VIVA
organization)	Correlate the clinical conditions	C3		OSPE
	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		
	• Enumerate the bones of foot	C1		
	Identify different bones of foot	C1		
D 67	Discuss bony features and muscle attachment	C2	SGD,	MCQ
Bones of Foot	• Discuss fracture of metatarsals and os trigonum, avascular necrosis of head of talus	C3	Skill Lab	SAQ VIVA

	Correlate the clinical conditions	C3		OSPE
	Understand the preventive and curative health care measures	C3	7	
	Practice the principles of Bioethics	C3		
	Apply strategic use of AI in health care	C3		
	Read a research article	C3		
	Tabulate muscle on the dorsal aspect of foot	C2		
	Describe blood supply and nerve supply	C2		
Dorsum of foot	Discuss cutaneous innervation of dorsum of foot	C2	SGD, Skill	MCQ
	Palpate the dorsalis pedis artery on dorsum of foot	C3	Lab	SAQ
	Discuss other clinicals related to the dorsum of the foot	C3		VIVA
	Correlate the clinical conditions	C3		OSPE
	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		
	Describe the articular surfaces of ankle joint	C2		
Ankle Joint	Describe the attachment of capsule	C2	Skill Lab	
	Enumerate the ligaments	C1		MCQ
	Discuss the movements possible at ankle joint and muscles producing them	C2		SAQ VIVA
	Discuss ankle sprain	C3		OSPE
	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		
	Classify the joints of foot	C2		
	Discuss the articular surfaces, joint capsules, ligaments, movements and muscles producing movements	C2		MCQ
Joints of Foot	Discuss major ligaments in detail	C2	SGD, Skill	SAQ
	Discuss tibial nerve entrapment	C3	Lab	VIVA
	Discuss club foot, claw foot and other clinical conditions	C3		OSPE

	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		
	Identify Surface landmarks	C1		
	Describe cutaneous innervation of sole of foot	C2		
	Describe Plantar aponeurosis its attachments	C2	SGD, Skill	MCQ
Sole of foot	Discuss flexor retinaculum	C2	Lab	SAQ
(Muscles)	Discuss muscles in different layers of foot with origin, insertion, nerve supply and actions	C2		VIVA OSPE
	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		
	Enlist nerves and arteries present in sole of foot	C1		
	Discuss route and relations of neurovascular bundle in sole of foot	C2	SGD, Skill	MCQ
Sole of foot	• Describe the formation of vascular arches of foot along with clinicals	C2, C3		
(Neurovascular	Discuss plantar fasciitis	C3	Lab	SAQ
Organization)	Correlate the clinical conditions	C3		VIVA OSPE
	Understand the preventive and curative health care measures	C3		OSPE
	Practice the principles of Bioethics	C3		
	Apply strategic use of AI in health care	C3		
	Read a research article	C3		
	Classify the arches of foot	C2		
	Describe different components of arches of foot	C2		MCQ
Arches of Foot and Gait	Discuss stability factors of arches of foot	C2		SAQ
Cycle	• Discuss pes planus (flat foot), club foot and other clinicals	C3	SGD, Skill	VIVA
	Discuss gait cycle and its stages	C2	Lab	OSPE
	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		
	Discuss anatomical features of thymus and tonsils	C2		MCQ
	Describe blood supply, venous drainage and lymphatic drainage of thymus and tonsils	C2	SGD, Skill Lab	SAQ VIVA
	Enumerate functions of thymus and tonsils	C1		OSPE
	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		
	Discuss the location of spleen	C2		
	Enumerate anatomical relations of spleen	C1		
	• Discuss blood supply, venous drainage and lymphatic drainage of spleen	C2	SGD, Skill	MCQ
Spleen	Correlate the clinical conditions	C3	Lab	SAQ
	Understand the preventive and curative health care measures	C3		VIVA OSPE
	Practice the principles of Bioethics	C3		OSPE
	Apply strategic use of AI in health care	C3		
	Read a research article	C3		
	Identify different structures on radiographs	C3		
Radiology, Surface Anatomy & Cross	• Demonstrate the surface anatomy of various structures present in posterior compartment of leg and foot	P	SGD, Skill Lab	MCQ SAQ
Sectional Anatomy	Demonstrate the surface anatomy of spleen, thymus and tonsils	P		VIVA
	Discuss the Cross-Sectional anatomy at the level of leg & foot	C2		OSPE
	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		

Topics	Learning objectives		Learning Resources
	Illustrate cutaneous innervation	•	Clinically Oriented Anatomy
	 Describe superficial fascia & deep fascia. 		9th Edition, pg no.755
Posterior comp	2 is two superintered with weep in which the process in posterior to input	tment	
of leg and fl	- I doubtle off with the strong and the strong of the stro	s of •	
retinaculu	posterior compartment or reg		c&pp=ygUTY29tcGFydG1lbnRzIG9mIGxlZw%
	 Discuss ruputured calcaneal tendon, calcaneal bursitis and acce 	ssory	<u>3D%3D</u>
	soleus muscle	•	https://www.sciencedirect.com/science/article/abs
	• Correlate the clinical aspects		/pii/S1440244004800343
	Read relevant research article	•	
	Use digital library		
	 Describe origin, course relations, branches and tributaries of 	•	connectify content of materialy
	neurovascular bundle		9th Edition, pg no. 755
Neurovasc	biseuss superficial veins i.e long and short supricious veins		
organizatio	r dipute the posterior tiolar pulse	•	https://www.youtube.com/watch?v=Bj4c7wGdIw
posterior comp	Discuss chinear correlation related to vehicus retain in leg		c&pp=ygUTY29tcGFydG1lbnRzIG9mIGxlZw%
of leg	• Contente the chinear aspects		<u>3D%3D</u>
	Read relevant research article	•	https://www.mdpi.com/2077-0383/11/21/6448
	Use digital library		
	• Classify the joints of foot	•	Clinically Oriented Anatomy
	• Discuss the articular surfaces, joint capsules, ligaments, movem	ents and	
Foot Join	maseres producing movements	•	https://www.youtube.com/watch?v=Ex9KzkAYN
	 Discuss major ligaments in detail 		-8&pp=ygUKZm9vdCBqb2ludA%3D%3D
	• Discuss tibial nerve entrapment	•	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3
	 Discuss club foot, claw foot and other clinical conditions 		180294/
	Correlate the clinical aspects		
	Read relevant research article		
	Use digital library Describe the attachment of capsule		Clinically Oriented Anatomy
	• Enumerate the ligaments		9th Edition, pg no. 806
	 Discuss the movements possible at ankle joint and muscles prod 	lucing t	
	 Discuss the movements possible at ankle joint and muscles prod Discuss ankle sprain 	iucilig t	https://www.youtube.com/watch?v=Ex9KzkAYN
Ankle joi	int Discuss different types of ankle injuries		-8&pp=ygUKZm9vdCBqb2ludA%3D%3D
	Discuss different types of ankle injuries		Octobe 180 remits 1 do order to the 100 or 100 or
	 Correlate the clinical aspects Read relevant research article 		
	• Read felevant fescarch article		

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	• Use digital library	•	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3 414868/
	 Identify Surface landmarks Describe cutaneous innervation of sole of foot	•	Clinically Oriented Anatomy 9th Edition, pg no. 768-781
Sole of foot	Describe Plantar aponeurosis its attachmentsDiscuss flexor retinaculum	•	https://www.youtube.com/watch?v=JorGDBbPzI &pp=ygUcc29sZSBvZiBmb290IGFuYXRvbXkg
	• Discuss muscles in different layers of foot with origin, insertion, ne supply and actions	rve	
	 Correlate the clinical aspects Read relevant research article 	•	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3 311689/
	• Use digital library		<u>511007/</u>
	 Discuss the location of spleen Enumerate anatomical relations of spleen 	•	Clinically Oriented Anatomy 9th Edition, pg no. 487
Spleen	 Discuss blood supply, venous drainage and lymphatic drainage of sp Discuss clinical correlations of spleen with special reference to spleen Correlate the clinical aspects 	ne c t	n ohttps://www.youtube.com/watch?v=3K5I6MMD A8M&pp=ygUOc3BsZWVuIGFuYXRvbXk%3D
	Read relevant research articleUse digital library	•	https://www.sciencedirect.com/science/article/pii/S0046817782802232
Gait cycle	 Define the gait cycle Discuss the stages of gait cycle Correlate the clinical aspects 	•	Clinically Oriented Anatomy 9th Edition, pg no. 701, 768-781
	 Correlate the critical aspects Read relevant research article Use digital library 	•	https://www.youtube.com/watch?v=1u6d1CX7o9 c&pp=ygUXZ2FpdCBjeWNsZSBiaW9tZWNoY W5pY3M%3D
		•	https://www.sciencedirect.com/topics/engineering/gait-cycle

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

]	Physiology				
		Theory				
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 2.Explain the role of bone marrow in hemopoiesis and erythropoiesis 3.Draw steps of hemopoiesis 4. Define committed and uncommitted cells	1.C2 2. C2 3. C3 4. C1	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE	 Ganong's Review of Medical Physiology.25THEditi on. Section05, Cardiovascular Physiology (Chapter 31, Page 553) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 16, Page 547,548) Physiological Basis of Medical Practice by Best & Taylor's.13thEdition. Section 03, Blood (Chapter 19, Page 347) (Chapter 20, Page 356) Textbook of Medical Physiology by Guyton & Hall.14thEdition. Red blood cells, Anemia and Polycythemia. Section 06. (Chapter 33, Page 439) 	https://accessmedicine.mhmedical.com/content .aspx?bookid=3047&se ctionid=255121548 2.https://youtu.be/cm8I K24RRvA

Plasma Proteins	1.Enumerate plasma proteins, their properties, sites of production and their functions. 2.Explain effects of deficiency of plasma proteins 3.Discuss conditions associated with decreased production and increased excretion of plasma proteins	C1 C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE	 Ganong's Review of Medical Physiology.25THEditi on. Section05, Cardiovascular Physiology (Chapter 31, Page 563) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 16, Page 547) Physiological Basis of Medical Practice by Best & Taylor's.13thEdition. Section 03, Blood (Chapter 19, Page 	https://www.ncbi.nlm.n ih.gov/books/NBK5315 04/ 2.https://accessmedicin e.mhmedical.com/conte nt.aspx?bookid=1366& sectionid=73247095348 ,353)
WBCs classification & formation. Neutrophils, Eosinophils &Basophils and their properties	 Enumerate and explain various types of leukocytes and steps of leucopoiesis. Explain the characteristics and functions. Conditions in which these cells are increased and decreased. Leukemias and their effects on the body 	C1/C2 C2 C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE	• Textbook of Medical Physiology by Guyton & Hall.14 th Edition. Resistance of the body to Infection. Section 06. (Chapter 34, Page 449,456,457)	https://www.ncbi.nlm.n ih.gov/pmc/articles/PM C9777002/ 2.https://youtu.be/TelO cCkZX7c

affecting erythropoiesis 3 4	Elaborate Morphological features of RBCs. Describe the stages of production of RBCs. Recall Life span of RBCs. Enumerate and explain factors which affect erythropoiesis. Enlist sites of production of erythropoietin Describe recombinant erythropoietin. Explain mechanism of release and action of erythropoietin	C2 C1 C2 C1 C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE	 Ganong's Review of Medical Physiology.25THEditi on. Section05, Cardiovascular Physiology (Chapter 31, Page 553) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 16, Page 547,548) Physiological Basis of Medical Practice by Best & Taylor's.13thEdition. Section 03, Blood (Chapter 19, Page 347) (Chapter 20, Page 356) Textbook of Medical Physiology by Guyton & Hall.14thEdition. Red blood cells, Anemia and Polycythemia. 	https://accessmedicine.mhmedical.com/content .aspx?bookid=3047&se ctionid=255121548 2.https://youtu.be/cm8I K24RRvA
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Monocytes -macrophage system & lymphocytes	 Explain the characteristics and functionsof monocytes. Explain monocytemacrophage system; importance 	C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE	 Ganong's Review of Medical Physiology.25THEditio n. Section01, Immunity, Infection and Inflammation (Chapter 03, Page 67) Physiological Basis of Medical Practice by Best & Taylor's.13thEdition. Section 03, Blood (Chapter 21, Page 371) (Chapter 22, Page 387) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 34, Page 450-452) 	https://www.sciencedir ect.com/topics/pharmac ology-toxicology-and- pharmaceutical- science/mononuclear- phagocyte-system 2.https://bmcbiol.biome dcentral.com/articles/10 .1186/s12915-017- 0392-4
Hemoglobin & Hemoglobinopathies, Iron Metabolism	 Discuss details about iron metabolism in body including iron absorption and storage. Understand the structure, synthesis and functions of hemoglobin and its types. Enlist different types of hemoglobinopathies 	C2 C2 C1	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE	 Ganong's Review of Medical Physiology.25THEditio n. Section05, (Chapter 31, Page 555) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 16, Page 553) Physiological Basis of Medical Practice by Best & Taylor's.13thEdition. (Chapter 23, Page 	https://www.sciencedir ect.com/topics/medicin e-and-dentistry/red- blood-cell-indices 2.https://youtu.be/Q UHqYVK-Nhg 3. https://youtu.be/mOrRJ Bqm744

Process of inflammation and Lines of defense during inflammation	1. Describe the role of neutrophils and monocytes in inflammation. 2. Elaborate Lines of defense	1.C1, C2 2. C1, C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE	 407,409) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 34, Page 446,447) Ganong's Review of Medical Physiology.25TH Edition. Section01, Immunity, Infection and Inflammation (Chapter 03, Page 81) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 03, Blood) (Chapter 22, Page 384) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 34, Page 454) Ganong's Review of 	https://youtu.be/WFm9j 1rNkQs .https://en.wikipedia.or g/wiki/Inflammation .https://www.verywellh ealth.com/signs-of- inflammation-4580526
Red cell fragility, ESR & Red cell indices, Anemia & polycythemia	 Define RBC fragility; importance; conditions in which fragility is changed. Discuss various blood indices, give their 	C1 C2 C1 C2	LGIS	SEQ VIVA VOCE	Medical Physiology.25 TH Editio n. Section05, (Chapter 31, Page 555) Human Physiology by	ect.com/topics/medicin e-and-dentistry/red- blood-cell-indices 2.https://youtu.be/Q UHqYVK-Nhg

	formulae,co-related with different types of anemias. 3. Enumerate various types of anemias and polycythemias. 4. Dliscuss details about various types of anemias and polycythemia and their effect on circulatory system.		MCQ (LMS based Assessment, MST based Assessment) OSPE	Dee Unglaub Silver thorn. 8 TH Edition. (Chapter 16, Page 553) • Physiological Basis of Medical Practice by Best & Taylor's.13 th Edition. (Chapter 23, Page 407,409) • Textbook of Medical Physiology by Guyton & Hall.14 th Edition. Section 06. (Chapter 34, Page 446,447)	3. https://youtu.be/mOrRJ Bqm744
Platelet formation & function. hemostasis, blood coagulation tests (BT, CT, PT, APTT and INR)	1. Explain thrombocytopoiesis. C2 2. Describe functions of platelets 3. Define hemostasis. C2 4. Explain steps of hemostasis	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE	 Ganong's Review of Medical Physiology.25TH Edition. Section05, (Chapter 31, Page 564) (Chapter 03, Page 79) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 16, Page 558) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 24, Page 413) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 	https://my.clevelandclin ic.org/health/symptoms /21999-hemostasis https://www.sciencedir ect.com/topics/neurosci ence/hemostasis

Fate of RBCs & Jaundice	and explain their destruction. 2. Describe various types, compare and differentiate between various types of jaundice	1, C2 1, C2 LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE	 Ganong's Review of Medical Physiology.25THEditio n. Section05, (Chapter 31, Page 555) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 16, Page 553) Physiological Basis of Medical Practice by Best & Taylor's.13thEdition. (Chapter 23, Page 407,409) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 34, Page 446,447) 	https://www.sciencedir ect.com/topics/medicin e-and-dentistry/red- blood-cell-indices 2.https://youtu.be/Q UHqYVK-Nhg 3. https://youtu.be/mOrRJ Bqm744
Blood coagulation	Explain hemostasis, mechanism of blood coagulation, fibrinolysis and anticoagulants	C2 LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment)	 Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 16, Page 559) Physiological Basis of Medical Practice by Best & 	https://youtu.be/gExUC rpAKyQ https://medlineplus.gov /lab-tests/coagulation- factor-tests/

				OSPE	Taylor's.13 th Edition. (Chapter 24, Page 417) • Textbook of Medical Physiology by Guyton & Hall.14 th Edition. Section 06. (Chapter 37, Page 479)	
Types of immunity, Physiology of innate immunity tolerance & auto immunity	 Define immunity and its types. Compare and contrast innate and acquired immunity. Difference between passive and active immunity 	C1 C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE	 Ganong's Review of Medical Physiology.25THEditio n. Section01, Immunity, Infection and Inflammation (Chapter 03, Page 67) Physiological Basis of Medical Practice by Best & Taylor's.13thEdition. Section 03, Blood (Chapter 21, Page371) (Chapter 22, Page 387) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 34, Page 450-452) 	https://www.sciencedir ect.com/topics/pharmac ology-toxicology-and- pharmaceutical- science/mononuclear- phagocyte-system 2.https://bmcbiol.biome dcentral.com/articles/10 .1186/s12915-017- 0392-4
Concept of intravascular anticoagulants and bleeding disorders (Vit K deficiency, hemophilia and thrombocytopenia)	Explain Intravascular coagulation.	1.C2 2.C2 3. C1		MCQ SEQ VIVA VOCE	Human Physiology by Dee Unglaub Silver thorn. 8 TH Edition. (Chapter 16, Page 559)	https://youtu.be/gExUC rpAKyQ

	2. Discuss Bleeding disorders.3. Enlist Types of hemophilia	LGIS	MCQ (LMS based Assessment, MST based Assessment) OSPE	 Physiological Basis of Medical Practice by Best & Taylor's.13thEdition. (Chapter 24, Page 417) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 37, Page 	https://medlineplus.gov /lab-tests/coagulation- factor-tests/
Physiology of acquired immunity B-Cells	1. Enumerate various types of lymphocytes 2. Discuss their important characteristics and 3. Explain the mechanism of preprocessing	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE	 Ganong's Review of Medical Physiology.25THEditio n. Section01, Immunity, Infection and Inflammation (Chapter 03, Page 67) Physiological Basis of Medical Practice by Best & Taylor's.13thEdition. Section 03, Blood (Chapter 21, Page 371) (Chapter 22, Page 387) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 34, Page 450-452) 	https://www.sciencedir ect.com/topics/pharmac ology-toxicology-and- pharmaceutical- science/mononuclear- phagocyte-system 2.https://bmcbiol.biome dcentral.com/articles/10 .1186/s12915-017- 0392-4

Thromboembolic condition (DVT, Pulmonary Embolism, DIC) Anticoagulant therapy (Heparin, warfarin, Prevention of blood clotting outside the body)	 Discuss different Thromboembolic Conditions Explain Pulmonary Embolism and clinical correlation Enlist different Anticoagulant therapy 	C2 C2 C1	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE	 Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 16, Page 559) Physiological Basis of Medical Practice by Best & Taylor's.13thEdition. (Chapter 24, Page 417) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 37, Page 479) 	https://youtu.be/gExUC rpAKyQ https://medlineplus.gov /lab-tests/coagulation- factor-tests/
Physiology of acquired immunity T-Cells. Allergy and Hypersensitivity reactions, Auto-immune diseases and AIDS	 Define clone and explain the roles of T and B lymphocyte clones in immunity Discuss the mechanisms involved in Immune Tolerance Compare Type I and Type IV hypersensitivity reactions Describe the process of immunization Understand role of T-lymphocytes in transplants Identify different types 	C1, C2 C2 C1 C2 C1	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE	 Ganong's Review of Medical Physiology.25THEditio n. Section01, Immunity, Infection and Inflammation (Chapter 03, Page 67) Physiological Basis of Medical Practice by Best & Taylor's.13thEdition. Section 03, Blood (Chapter 21, Page 371) (Chapter 22, Page 387) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. 	https://www.sciencedir ect.com/topics/pharmac ology-toxicology-and- pharmaceutical- science/mononuclear- phagocyte-system 2.https://bmcbiol.biome dcentral.com/articles/10 .1186/s12915-017- 0392-4

	of tissue grafts			(Chapter 34, Page 450-452)	
Physiological mechanism of temperature regulation	 Explain Concept of temperature Discuss Physiological mechanism of temperature regulation 	C2 C2 LGI	MCQ S SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE	Textbook of Medical Physiology by Guyton & Hall.14 th Edition. Section 06. (Chapter 73, Page 889-936)	https://shop.elsevie r.com/books/guyto n-and-hall- textbook-of- medical- physiology/hall/97 8-0-323-59712-8
ABO & Rh Blood grouping system	 Enlist Blood group and its types Explain Rh Blood Grouping System 	C1 C2 LG1	SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE	 Ganong's Review of Medical Physiology.25TH Edition. Section05, (Chapter 31, Page 558) (Chapter 36, Page 473) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 25, Page 432) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 36, Page 471) 	https://www.sciencedir ect.com/topics/agricultu ral-and-biological- sciences/abo-blood- group-system https://youtu.be/wfqnN uYIY78
Role of Hypothalamus in temperature regulation	 Discuss Role of Hypothalamus in temperature regulation Explain Temperature Regulating centers 	C2 C2 LGI	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE	• Textbook of Medical Physiology by Guyton & Hall.14 th Edition. Section 06. (Chapter 73, Page 889-936)	https://shop.elsevier.co m/books/guyton-and- hall-textbook-of- medical- physiology/hall/978-0- 323-59712-8

Rh Blood grouping system and Erythroblastosis fetalis	 Discuss Rh Blood Grouping System Explain Erythroblastosis fetalis Discuss Clinical correlation 	C2 C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE	 Ganong's Review of Medical Physiology.25TH Edition. Section05, (Chapter 31, Page 558) (Chapter 36, Page 473) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 25, Page 432) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 36, Page 471) 	https://www.sciencedir ect.com/topics/agricultu ral-and-biological- sciences/abo-blood- group-system https://youtu.be/wfq nNuYIY78
Disorders of temperature regulation (Fever, Heat stroke, Exposure of body to extreme cold)	 Discuss Disorders of temperature regulation Explain Concept of Fever Clinical correlation Of Heat Stroke 	1.C2 2.C2 3.C3	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE	• Textbook of Medical Physiology by Guyton & Hall.14 th Edition. Section 06. (Chapter 73, Page 889-936)	https://shop.elsevier.co m/books/guyton-and- hall-textbook-of- medical- physiology/hall/978-0- 323-59712-8
Blood transfusion hazards. Tissue and organ transplantations	 Discuss Blood transfusion hazards. Explain Effect of blood transfusion on various organs Explain Tissue and organ transplantations 	C2 C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE	 Ganong's Review of Medical Physiology.25TH Edition. Section05, (Chapter 31, Page 558) (Chapter 36, Page 473) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 25, Page 432) 	https://www.sciencedir ect.com/topics/agricultu ral-and-biological- sciences/abo-blood- group-system https://youtu.be/wfqnN uYIY78

			• Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 36, Page 471)
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Topics	At the end of discussion students should be able to:	Learning	Teaching Strategy	Assessment
		Domains		Tools
Functions & composition of blood, Hemopoiesis and Bone marrow	1.Describe composition and general functions of blood 2.Explain the role of bone marrow in hemopoiesis and erythropoiesis 3.Draw steps of hemopoiesis 4. Define committed and uncommitted cells	1.C2 2. C2 3. C3 4. C1 5.C3	SGD	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST
	5. Correlate basic knowledge with clinical application			based Assessment) OSPE
Hemoglobin & Hemoglobinopathies, Iron Metabolism	 Discuss details about iron metabolism in body including iron absorption and storage Understand the structure, synthesis and functions of hemoglobin and its types Enlist different types of hemoglobinopathies Correlate basic knowledge with clinical application 	C2 C2 C1 C3	SGD	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
Platelet formation & function. hemostasis, blood coagulation tests (BT, CT, PT, APTT and INR)	 Explain thrombocytopenia Describe functions of platelets Define hemostasis Explain steps of hemostasis Correlate basic knowledge with clinical application 	C2 C2 C1 C2 C3	SGD	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
	 Explain Concept of temperature Discuss Physiological mechanism of temperature regulation Correlate basic knowledge with clinical application 	C2 C2 C3	SGD	MCQ SEQ VIVA VOCE

Physiological mechanism of temperature regulation				MCQ (LMS based Assessment, MST based Assessment) OSPE
Stages of Erythropoiesis Factors Affecting Erythropoiesis (First week)	 Elaborate Morphological features of RBCs Describe the stages of production of RBCs Recall Life span of RBCs Enumerate and explain factors which affect erythropoiesis Enlist sites of production of erythropoietin Describe recombinant erythropoietin Explain mechanism of release and action of erythropoietin 	C2 C1 C1 C2 C1 C2 C2	SGD	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
Physiology of WBC (third week)	 Enumerate and explain various types of leukocytes and steps of leucopoiesis Explain the characteristics and functions Conditions in which these cells are increased and decreased Leukemias and their effects on the body 	C1/C2 C2 C2 C2	SGD	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
Physiology of platelets (Fourth week)	 Explain thrombocytopenia Describe functions of platelets Define hemostasis Explain steps of hemostasis 	C2 C2 C1 C2	SGD	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
Blood transfusion hazards. Tissue and organ transplantations (Fifth week)	 Discuss Blood transfusion hazards. Explain Effect of blood transfusion on various organs Explain Tissue and organ transplantations 	C2 C2 C2	SGD	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
Disorders of temperature regulation	 Discuss Disorders of temperature regulation Explain Concept of Fever Clinical correlation Of Heat Stroke 	1.C2 2.C2 3.C3		MCQ SEQ VIVA VOCE

(Fever, Heat stroke,	SGD	MCQ (LMS based
Exposure of body to		Assessment, MST
extreme cold) (Fifth		based Assessment)
week)		OSPE

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

Function of Plasma Proteins	1.Enumerate plasma proteins, their properties, sites of productions and their functions 2.Explain effects of deficiency of plasma proteins 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) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 16, Page 547) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 03, Blood (Chapter 19, Page 348,353) https://www.ncbi.nlm.nih.gov/books/NBK531504/2. 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 Explain the characteristics and functions Conditions in which these cells are increased and decreased 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) https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9777002/ https://youtu.be/TelOcCkZX7c
Monocytes - macrophage system & lymphocytes	Explain the characteristics and functions of monocytes. • Explain monocytemacrophage system; importance	 Ganong's Review of Medical Physiology.25TH Edition. Section 01, Immunity, Infection and Inflammation (Chapter 03, Page 67) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 03, Blood (Chapter 21, Page 371) (Chapter 22, Page 387) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 34, Page 450-452) https://www.sciencedirect.com/topics/pharmacology-toxicology-and-pharmaceutical-science/mononuclear-phagocyte-system 2.https://bmcbiol.biomedcentral.com/articles/10.1186/s12915-017-0392-4
Process of	Describe the role of neutrophils and monocytes in inflammation	Ganong's Review of Medical Physiology.25TH Edition. Section 01, Immunity, Infection and Inflammation (Chapter 03, Page 81)

inflammation and Lines of defense during inflammation	Elaborate Lines of defense	 Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 03, Blood) (Chapter 22, Page 384) 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
Red cell fragility, ESR & Red cell indices, Anemia & polycythemia	 Define RBC fragility; importance; conditions in which fragility is changed. Discuss various blood indices, give their formulae, corelate with different types of anemias. Enumerate various types of anemias and polycythemias. Discuss details about various types of anemias and polycythemia and polycythemia and their effect on circulatory system. 	 .https://www.verywellhealth.com/signs-of-inflammation-4580526 Ganong's Review of Medical Physiology.25TH Edition. Section 05, (Chapter 31, Page 555) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 16, Page 553) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 23, Page 407,409) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 34, Page 446,447) https://www.sciencedirect.com/topics/medicine-and-dentistry/red-blood-cell-indices 2.https://youtu.be/QUHqYVK-Nhg 3. https://youtu.be/mOrRJBqm744
Blood coagulation	Explain hemostasis, mechanism of blood coagulation, fibrinolysis and anticoagulants	 Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 16, Page 559) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 24, Page 417) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 37, Page 479) https://youtu.be/gExUCrpAKyQ 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) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 25, Page 432) 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 https://youtu.be/wfqnNuYIY78
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	Praction	eals		
Topic	Learning Objectives	Learning Domains	Learning Strategy	Assessment Tools
Determination of Rh blood group	 Principle Procedure Methods Types of blood groups Clinical Correlations of blood transfusion 	C1/C3 A3 P3	Practical/skill lab	Viva Voce OSPE Video Assisted Assessment
Determination of Clotting time (CT)	ProcedureClinical importanceRecall Normal values	C1/C3 A3 P3	Practical/skill lab	Viva Voce OSPE Video Assisted Assessment
Determination of Bleeding time (BT)	ProcedureClinical importanceRecall Normal values	C1/C3 A3 P3	Practical/skill lab	Viva Voce OSPE Video Assisted Assessment
Recording of Body Temperature	 Principle Procedure Methods Clinical Correlations 	C1/C3 A3 P3	Practical/skill lab	Viva Voce OSPE Video Assisted Assessment
	Reference: Saqib Praction	cal Copy First Year		1

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	Theory			
Topics	At the end of lecture students should be able to	Learning Domain	Teaching Strategy	Assessment Tool
	Enlist various functions performed by blood.	C1		
Blood	Describe Composition of blood.	C2	LGIS	MCQs

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

Recall normal level of Bilirubin	C1	LGIS	MCQs SAQs
• Enlist types of Jaundice.	C1		
Describe Biochemical tests to distinguish various types of	C2	LGIS	
jaundice.			
Describe Physiological Jaundice	C2		

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

	Recall Recommended Dietary allowance.	C1		
	• Recall Sources of Vitamin B12	C1	LGIS	MCQs SAQs
Vitamin B12	• Describe biochemical role of vitamin B12	C2		
	• Discuss Deficiency effects of B12	C2		

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

Topics Of SDL	Learning Objectives	Learning resources
Structure of hemoglobin and myoglobin	 Describe Structure of hemoglobin Describe structure of myoglobin. Discuss Biochemical roles of hemoglobin and myoglobin. 	 Lippincott Illustrated reviews of biochemistry 8th edition (Chapter 03, page 25-28) https://doi.org/10.1016/j.bcmd.2017.10.006 https://www.youtube.com/watch?v=Qv-KExGKAYw Use digital library https://chemed.chem.purdue.edu/genchem/topicreview/bp/1biochem/blood3.html
Types of Hemoglobin	 Enlist various types of Hemoglobin. Describe Importance of heme and globin components Interpret importance of HbA1c in diagnosis of Diabetes 	 Lippincott Illustrated reviews of biochemistry 8th edition (Chapter 03, page 33-34) https://pubmed.ncbi.nlm.nih.gov/34200315/ https://www.youtube.com/@DrAishwaryaKelkar Use digital library 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. Enlist various factors affecting the curve. 	 Lippincott Illustrated reviews of biochemistry 8th edition (Chapter 03, page 28-32) https://pubmed.ncbi.nlm.nih.gov/2650756/

Hemoglobinopathies	 Discuss hemoglobinopathies. Enlist Types of thalassemia. Discuss Familial counseling. Elaborate Preventive measures. 	 https://youtu.be/BYGPkRFvzOc Use digital library https://www.osmosis.org/learn/Oxygen-hemoglobin dissociation curve Lippincott Illustrated reviews of biochemistry 8th edition (Chapter 03, page 35-39) https://pubmed.ncbi.nlm.nih.gov/30193516/ https://youtu.be/34u1sOLrgV0 Use digital library 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) https://www.sciencedirect.com/science/article/pii/S0891584999002233 Use digital library https://www.youtube.com/watch?v=f-0n_eOK4JE 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) https://pubmed.ncbi.nlm.nih.gov/20226990/ https://www.mayoclinic.org/diseases-conditions/porphyria/symptoms-causes/syc-20356066#:~:text=Porphyria%20(por%2DFEAR%2De,the%20body's%20organs%20and%20tissues. 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. Describe Steps in synthesis of Bilirubin Recall Normal level of S. Bilirubin. 	 Lippincott Illustrated reviews of biochemistry 8th edition (Chapter 21, page 282-283) https://www.sciencedirect.com/science/article/pii/S08915849990 02233 Use digital library https://www.youtube.com/watch?v=f-0n_eOK4JE

		https://pubmed.ncbi.nlm.nih.gov/29126700/
Jaundice	 Define jaundice. Recall normal level of Bilirubin. Enlist types of Jaundice. Describe Biochemical tests to distinguish various types of jaundice. Describe Physiological Jaundice 	 Lippincott Illustrated reviews of biochemistry 8th edition (Chapter 21, page 284-285) https://pubmed.ncbi.nlm.nih.gov/14765767/ https://www.youtube.com/watch?v=gIACp5js4MU https://my.clevelandclinic.org/health/diseases/15367-adult-jaundice
Plasma proteins	 Describe plasma proteins. Discuss Biochemical role of various plasma proteins. Recall normal levels of plasma proteins Illustrate Role of A/G ratio. 	 Harpers Illustrated biochemistry 30th edition (Chapter 49, page 588-589) http://ib.bioninja.com.au/options/option-d-human-physiology/d3-functions-of-the-liver/plasma-proteins.html https://www.nottingham.ac.uk/nmp/sonet/rlos/bioproc/plasma_proteins/page_three.html https://pubmed.ncbi.nlm.nih.gov/21544836/ Use digital library
Acute phase proteins & Albumin	 Describe Role of albumin. Discuss Role of C- reactive protein. 	 Harpers Illustrated biochemistry 30th edition (Chapter 49, page 590-592) https://www.youtube.com/watch?v=xMSEl1ad0z8 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3053509/ https://pubmed.ncbi.nlm.nih.gov/9971870/ Use digital library
Haptoglobin and transferrin	 Describe Structure of Haptoglobin and transferrin. Discuss biochemical Role of Haptoglobin and transferrin. 	 Harpers Illustrated biochemistry 30th edition (Chapter 49, page 592) https://pubmed.ncbi.nlm.nih.gov/23016887/ https://www.youtube.com/watch?v=QR_hcSow4OI https://pubmed.ncbi.nlm.nih.gov/7027909/ Use digital library
Ferritin and hemosiderin	 Describe biochemical role of ferritin and hemosiderin. Describe Hemosiderosis. 	 Harpers Illustrated biochemistry 30th edition (Chapter 49, page 592-594) http://www.vivo.colostate.edu/hbooks/pathphys/topics/ferritin.html https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4831249/ https://www.forthwithlife.co.uk/blog/whats-the-difference-between-ferritin-and-iron/ Use digital library

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

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

Practical					
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 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 Describe Principal, method, normal blood level and clinical significance of S. Bilirubin 	Р	Skill Lab	OSPE	

Basic and Clinical Sciences (Vertical Integration)

Anatomy, Physiology & Biochemistry							
	Clinical Themes						
	Subjects	Topics	At the end of the session the student should be able to	Learning Domains			
	A	Ankle sprain	Apply basic knowledge of subject to study clinical case.	C3			
	Anatomy		Apply basic knowledge of subject to study clinical case.	C3			
	Physiology	Anemia	Apply basic knowledge of subject to study clinical case	C3			
	Dischamistry	Thalassemia	Apply basic knowledge of subject to study clinical case.	C3			
	Biochemistry		Apply basic knowledge of subject to study clinical	C3			
			case.				

Pathology							
	Theory						
	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		
	Mediators of inframmation	Classify inflammation	C2				
		Classify mediators of inflammationCell derived Plasma derived	C2				
		Describe general features of mediators of inflammation	C1				

Medicine							
	Theory						
Topic	At the End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool			
	Discuss Jaundice.	C2					
	Discuss various Types and Subtypes of Jaundice.	C2					
Jaundice	• Discuss the signs and symptoms of a patient with Jaundice due to various Causes.	C2	LGIS	MCQs			
	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.	C 1					
	Discuss the clinical Presentation of Heat Stroke.	C2					
	Discuss the diagnostic workup and management.	C2					

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

Spirally Integrated Courses / General Education Cluster (GEC) Courses

Content

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

	Family Medicine					
	Theory					
	Topic	At the End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool	
	Define Anemia.	C1				
		Discuss various Types and Subtypes of Anemia.	C2	LGIS	MCQs	
	Anemia	• Discuss the signs and symptoms of a patient with Anemia.	C2			
	Discuss the workup for diagnosis of type of anemia.	C2	1			
		• Discuss Treatment of Various types of anemia.	C2	-		

Biomedical Ethics						
Theory						
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; Understand the importance of taking permission before performing procedures (drawing blood, administering injections etc.) during laboratory sessions. A1 Show Respects other health professional team members and complete assigned task in professional manner. A1 	A1	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) Assignment to be uploaded on LMS 		
	• Employ collaborative negotiation to resolve conflict, anger, confusion and misunderstanding. A2	A2				



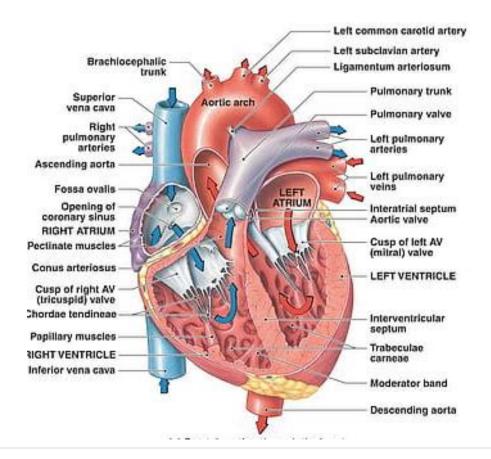
Course Contents

- Module V- Cardiacvascular System
- Module VI- Respiratory System Module

Block-III

Module No. 5 - Cardiacvascular System

Duration 5 Weeks



			Themes							
Block	Subjects	General	Embryology	Histology	Gross Anatomy					
		Anatomy								
	 Anatomy 	Heart & Vessels	Cardiovascular System	Heart & Vessels	Mediastinum, Heart, Great Vessels					
	Biochemistry	Carbohydrate chemistry, Lipid chemistry								
	• Physiology	 The Heart as a Pump and Function of the Heart Valves& regulation of heart pumping, cardiac cycle Rhythmical Excitation of the Hear &Specialized excitatory & conductive system of the heart & its control (revisit) Electrocardiogram, its interpretation & its abnormalities Medical Physics of Pressure, Flow, and Resistance, Vascular Distensibility and Functions of the Arterial and Venous Systems Microcirculation and the Lymphatic System, Local and Humoral Control of Blood Flow by the Tissues Nervous Regulation of the Circulation, and Rapid & Long-Term Control of Arterial Pressure, hypertension Cardiac Output, Venous Return, and Their Regulation Muscle Blood Flow and Cardiac Output During Exercise; the Coronary & regional circulation Cardiac Failure, Circulatory Shock 								
	Heart Valves and Heart Sounds; Dynamics of Valvular and Congenital Heart Defects Spiral Courses									
II	 The Holy Quran Translation Behavioral Sciences, Bioethics & Professionalism 	 Mumamalat-I Muashrat-II Ekhlaqiaat-I Mumamalat -I Breaking the b Stress and its r 	I pad news							
_	Radiology, Artificial Intelligence & Innovation	 Chest radiograph with perspective of cardiovascular system Radiology with perspective of Artificial Intelligence & Innovation 								
	Family Medicine	Approach to a	patient with chest pain							
	•	•								
	•	•								
	•	•								
	•	•								
	Vertical components									
	Community Medicine	Risk factors of coronary vascular disease								
	 Pathology 	• Edema								
	• Eye	Hypertensive 1	± •							
	 Pharmacology 	Clinical Pharm	nacology of Anti hypertensive	drugs						

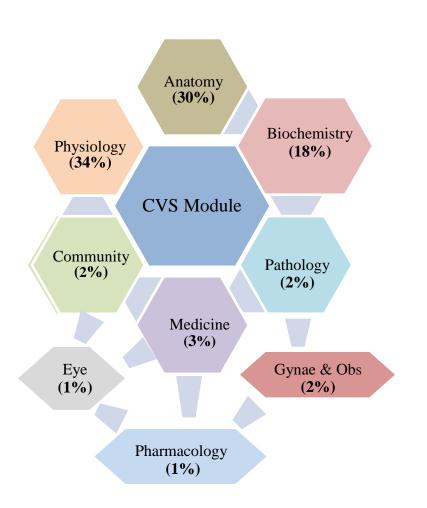
Medicine	ECG Changes (MI, Electrical Imbalance, Myocardial hypertrophy)				
	Overview of acute coronary syndrome & management of heart failure & management of shock				
	Hypertension				
Gynae & Obs	Cardiovascular changes in pregnancy				
- J	Hypertensive disorders in pregnancy (gestational hypertension, pre-eclampsia)				
	Early Clinical Exposure (ECE)				
 Cardiology 	See cases of Heart Failure and Dyspnea Raised JVP/Oedema				
	Clinical Examination of Precordium				
	Normal Heart Sounds				
	 Additional heart sounds See Cases of Coronary Heart Disease 				
 Radiology 	X-Ray chest				
	Cardiomegaly				
	Radiological signs of heart failure				
 Pediatrics 	See cases of congenital heart diseases				
	Pediatric case of Heart Failure				
	Clinical Relevance				

- Mechanisms and Management of Hypertension
- Pathophysiology of Myocardial Infarction (MI)
- Clinical Features of Heart Failure and Its Management
- Understanding Congenital Heart Defects (e.g., VSD, Tetralogy of Fallot)
- Basics of Interpreting an Electrocardiogram (ECG)
- Clinical Signs of Shock and Initial Management
- Pathophysiology of Valvular Heart Diseases (e.g., mitral stenosis)
- Risk Factors and Prevention of Atherosclerosis
- Pericarditis: Clinical Presentation and Diagnosis
 Cardiac Arrhythmias: Causes and Basic Treatment Principles

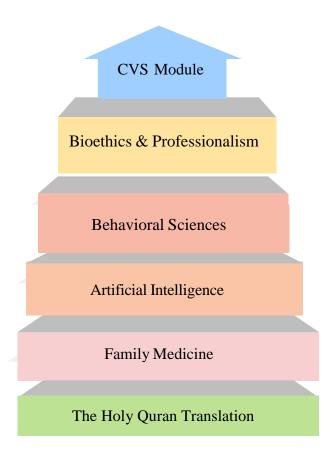
Implementation of Terms of Reference (TORS)

- Total hours of teaching, learning and formative/summative internal assessment to be completed in a year are predefined as per the guidelines of PMDC and to be strictly followed.
- The hours mentioned within each module are the mandatory minimum required.
- The content and the intended learning outcomes written are mandatory, to be taught, at the level required, as the end year assessment will be based on these. However, the level of cognition can be kept at a higher level.
- The Table of Specifications provided will be used for the three papers of the first professional examination.
- The same table of specifications should be used for the respective block exams for internal assessment.
- The criteria defined for continuous internal assessment is to be followed for each module and block respectively

Integration of Disciplines in CVS Module



Spiral / General Education Cluster Courses (7%)



Module No. 5 - CVS

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

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

Module Outcomes

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

Knowledge:

- 1. Explain the structural & developmental organization of CVS.
- 2. Explain different waves, segment and intervals of ECG and apply it to the interpretation of ECG.
- 3. Use technology based medical education including.

Artificial Intelligence

4. Appreciate concepts & importance of Family Medicine
Bionedical Ethics
Research

Skill:

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

Attitude:

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

CVS Module Team

Module Name : CVS Module
Duration of module : 05 Weeks

Focal Person Community Medicine

Focal Person Quran Translation

14. Focal Person Family Medicine

Lectures

Coordinator : Dr. Aneela Yasmeen
Co-coordinator : Dr. Sheena Tariq
Reviewed by : Module Committee

Dr. Afifa Kulsoom

Dr. Fahad Anwar

Dr. Sadia Khan

Module Committee			Module Task Force Team			
1.	Vice Chancellor RMU	Prof. Dr. Muhammad Umar	1.	Coordinator	Dr. Aneela (Senior Demonstrator of Physiology)	
2.	Chairperson Anatomy & Dean Basic Sciences	Prof. Dr. Ayesha Yousaf	2.	DME Focal Person	Dr. Farzana Fatima	
3.	Director DME	Prof. Dr. Ifra Saeed	3.	Co-coordinator	Dr. Kashif (Senior Demonstrator of Anatomy)	
4.	Chairperson Physiology	Prof. Dr. Samia Sarwar	4.	Co-Coordinator	Dr. Romessa Naeem (Demonstrator Biochemistry)	
5.	Chairperson Biochemistry	Dr. Aneela Jamil	5.	Co-coordinator	Dr. Sheena Tariq (Senior Demonstrator Physiology)	
6.	Focal Person Anatomy First Year MBBS	Asso. Prof. Dr. Mohtashim Hina				
7.	Focal Person Physiology	Dr. Sidra Hamid	DME Implementation Team			
			1.	Director DME	Prof. Dr. Ifra Saeed	
8.	Focal Person Biochemistry	Dr. Aneela Jamil	2.	Assistant Director DME	Dr. Farzana Fatima	
9.	Focal Person Pharmacology	Dr. Zunera Hakim	3.	Implementation Incharge 1st & 2 nd	Prof. Dr. Ifra Saeed	
				Year MBBS	Dr. Farzana Fatima	
					Dr. Saira Aijaz	
10.	Focal Person Pathology	Dr. Asiya Niazi	4.	Editor	Muhammad Arslan Aslam	
11.	Focal Person Behavioral Sciences	Dr. Saadia Yasir				



Syllabus of Cardiacvascular System (Module No. 5)

		Anatomy			
		Theory			
Topic	c	At the End of The Session Students Should Be Able To:	Learning Domain	Teaching Strategy	Assessment Tools
		Describe general organization of cardiovascular system	C2		
		Describe different types of circulations	C2]	
		Discuss general structural patterns of arteries and veins	C2		
		Classify capillaries	C1		MCQ
General An of CVS (Ge	•	• Explain bio - functional importance and location of continuous, fenestrated and sinusoidalcapillaries	C2	LGIS	SAQ VIVA
Organiza	tion	Discuss related clinicals	C3	1	
		To understand the Biophysiological aspects	C3	- - -	
		• Able to focus on provision of curative and preventive health care measures	C3		
		Practice the principles of Bioethics	C3		
		Apply strategic use of AI in health care	C3		
		How to read relevant research article	C3		
		Classify arteries on the basis of function and size	C1		
		Classify veins on the basis of function and size	C1	LGIS	
		Describe differences between arteries and veins	C2		
General Ana		Define anastomosis and discuss different types of arterial and venous anastomosis	C2		MCQ SAQ
`	CVS (Classification of vessels)	Differentiate between anatomic end arteries and functional end arteries giving example	C2		VIVA
		Discuss related clincals	C3		
		To understand the Biophysiological aspects	C3	1	

		Able to focus on provision of curative and preventive health care measures	C3		
		Practice the principles of Bioethics	C3	1	
		Apply strategic use of AI in health care	C3		
		How to read relevant research article	C3	1	
		Histology			l
		Describe general histological structure of arteries and veins	C2		
		Tabulate histological differences between arterioles, medium sized arteries, and largearteries	C2		
	Histology of CVS	Discuss related clinicals	C3		MCQ
	(Arteries and Veins)	To understand the Biophysiological aspects	C3	LGIS	SAQ
		Able to focus on provision of curative and preventive health care measures	C3		VIVA
		Practice the principles of Bioethics	C3		
		Apply strategic use of AI in health care	C3		
		How to read relevant research article	C3		
		Differentiate between continuous, fenestrated and sinusoidal capillaries	C2		
		• Enlist bio functions of endothelium	C2		
	Histology of CVS	Discuss related clinicals	C2		MCQ
	(Capillaries)	To understand the Biophysiological aspects	C3	LGIS	SAQ
		Able to focus on provision of curative and preventive health care measures	C3		VIVA
		Practice the principles of Bioethics	C3		
		Apply strategic use of AI in health care	C3		
		How to Read How to read relevant research article	C3		
		Describe histological details of endocardium, myocardium and epicardium	C3		
		Tabulate differences between blood capillaries and lymphatic capillaries	C2	_	MCQ

	of Heart & Lymphatic System)	Discuss biophysiological aspects of Heart & Lymphatic System	C2	LGIS	SAQ
		To understand the Biophysiological aspects	C3		VIVA
		Able to focus on provision of curative and preventive health care measures	C3		
		Practice the principles of Bioethics	C3		
		Apply strategic use of AI in health care	C3		
		How to Read How to read relevant research article	C3		
		Embryological Development			<u> </u>
		Recall the process of vasculogenesis	C2		
		Describe venous drainage of embryo	C2		MCQ
	Development of CVS	Enlist derivatives of vitelline veins	C1	LGIS	SAQ
	(Development of Veins)	Discuss role cardinal veins	C2		VIVA
		Describe Development of inferior vena cava	C2		
		Discuss related Congenital abnormalities	C3		
		To understand the Biophysiological aspects	C3		
		Able to focus on provision of curative and preventive health care measures	C3		
		Practice the principles of Bioethics	C3		
		Apply strategic use of AI in health care	C3		
		How to read relevant research article	C3		
		Describe development and transformation of aortic arches	C2		
		Enlist derivatives of 1-6th aortic arches	C1		MCQ
	Development of CVS (Aortic Arches and derivatives)	Discuss formation of intersegmental arteries	C2	LGIS	SAQ
		Describe sources and formation of coronary arteries	C2		VIVA
	ucrivatives)	Discuss development of aorta Related Congenital abnormalities	C3		
		To understand the Biophysiological aspects	C3		

Able to focus on provision of curative and preventive health care measures Practice the principles of Biocethics Apply strategic use of AI in health care How to read relevant research article C3 Development of CVS (Pormation, Position and Partitioning of heart tube) Development of CVS (Pormation, Position and Partitioning of heart tube) Development of cardiac loop Describe development of sinus venosus C2 Describe development of cardiac septu De					
Apply strategic use of AI in health care How to read relevant research article Discuss establishment of cardiogenin field Describe formation and position of heart tube in developing embryo Development of CVS (Formation, Position and Partitioning of heart tube) Explain importance of septum spurium Describe development of cardiac septa Discuss different methods of septum formation C2 Explain septum formation in right atrium C2 Describe development and differentiation of atria Discuss related congenital abnormalities To understand the Biophysiological aspects To understand the Biophysiological aspects Able to focus on provision of curative and preventive health care measures Apply strategic use of AI in health care How to read relevant research article Discuss establishment of cardiogenin field C2 Discuss formation of septum in atrioventricular canal C2 Discuss formation of septum in atrioventricular canal		• Able to focus on provision of curative and preventive health care measures	C3		
How to read relevant research article Development of CVS (Formation, Position and Partitioning of heart tube) Development of CVS (Formation, Position and Partitioning of heart tube) Development of CVS (Formation, Position and Partitioning of heart tube) Describe development of cardiac septa Describe development of cardiac septa Describe development of cardiac septa Discuss different methods of septum formation Explain septum formation in right atrium Describe development and differentiation of atria Describe development of cardiac septa Discuss related congenital abnormalities C3 Able to focus on provision of curative and preventive health care measures Able to focus on provision of curative and preventive health care measures Apply strategic use of AI in health care How to read relevant research article Discuss establishment of cardiogenin field Discuss establishment of cardiogenin field		Practice the principles of Bioethics	C3		
Development of CVS (Formation, Position and Partitioning of heart tube) Describe development of cardiac septa Posicuss of septum spurium Describe development of cardiac septa Explain importance of septum spurium Describe development of cardiac septa Discuss different methods of septum formation C2 Explain septum formation in right atrium C2 Discuss related congenital abnormalities To understand the Biophysiological aspects Able to focus on provision of curative and preventive health care measures Able to focus on provision of curative and preventive health care measures Apply strategic use of AI in health care Apply strategic use of AI in health care Discuss establishment of cardiogenin field Discuss formation of septum in atrioventricular canal C2 Discuss formation of septum in atrioventricular canal C2		Apply strategic use of AI in health care	C3		
Development of CVS (Formation, Position and Partitioning of heart tube) Describe development of cardiac loop Describe development of sinus venosus Explain importance of septum spurium Describe development of cardiac septa Discuss different methods of septum formation Explain septum formation in right atrium C2 Describe development and differentiation of atria Describe development and differentiation of atria Discuss related congenital abnormalities C3 To understand the Biophysiological aspects Able to focus on provision of curative and preventive health care measures Able to focus on provision of curative and preventive health care measures Apply strategic use of AI in health care How to read relevant research article Discuss establishment of cardiogenin field Discuss formation of septum in atrioventricular canal C2 Discuss formation of septum in atrioventricular canal		How to read relevant research article	C3		
Development of CVS (Formation, Position and Partitioning of heart tube) Describe development of sinus venosus Describe development of sinus venosus Describe development of sinus venosus Describe development of cardiac septa Discuss different methods of septum formation Discuss related congenital abnormalities Discuss related congenital abnormalities To understand the Biophysiological aspects Able to focus on provision of curative and preventive health care measures Practice the principles of Bioethics Apply strategic use of AI in health care How to read relevant research article Discuss establishment of cardiogenin field Discuss formation of septum in atrioventricular canal C2 Discuss development of sinus venosus C2 MCQ SAQ VIVA ** MCQ SAQ VIVA ** SAQ VIVA ** Output Discuss related congenital abnormalities C3 Able to focus on provision of curative and preventive health care measures C3 Apply strategic use of AI in health care Discuss establishment of cardiogenin field C2 Discuss of AI in health care Discuss of AI in health care Discuss establishment of cardiogenin field Discuss of AI in health care Discuss of AI in health care		Discuss establishment of cardiogenin field	C2		
Development of CVS (Formation, Position and Partitioning of heart tube) • Describe development of sinus venosus • Explain importance of septum spurium • Describe development of cardiac septa • Discuss different methods of septum formation • Explain septum formation in right atrium • Describe development and differentiation of atria • Discuss related congenital abnormalities • To understand the Biophysiological aspects • Able to focus on provision of curative and preventive health care measures • Apply strategic use of AI in health care • How to read relevant research article • Discuss sentablishment of cardiogenin field • Discuss formation of septum in atrioventricular canal		Describe formation and position of heart tube in developing embryo	C2		
Development of CVS (Formation, Position and Partitioning of heart tube) • Explain importance of septum spurium • Describe development of cardiac septa • Discuss different methods of septum formation • Explain septum formation • Explain septum formation • Explain septum formation in right atrium • Describe development and differentiation of atria • Discuss related congenital abnormalities • To understand the Biophysiological aspects • Able to focus on provision of curative and preventive health care measures • Practice the principles of Bioethics • Apply strategic use of AI in health care • How to read relevant research article • Discuss establishment of cardiogenin field • Discuss formation of septum in atrioventricular canal		Discuss formation of cardiac loop	C2		
(Formation, Position and Partitioning of heart tube) Describe development of cardiac septa Discuss different methods of septum formation Explain septum formation in right atrium C2 Discuss related congenital abnormalities To understand the Biophysiological aspects Able to focus on provision of curative and preventive health care measures Apply strategic use of AI in health care Apply strategic use of AI in health care How to read relevant research article Discuss establishment of cardiogenin field Discuss formation of septum in atrioventricular canal C2 LGIS SAQ VIVA LGIS SAQ VIVA		Describe development of sinus venosus	C2		
Partitioning of heart tube) • Describe development of cardiac septa • Discuss different methods of septum formation • Explain septum formation in right atrium C2 • Describe development and differentiation of atria C2 • Discuss related congenital abnormalities • To understand the Biophysiological aspects • Able to focus on provision of curative and preventive health care measures • Practice the principles of Bioethics • Apply strategic use of AI in health care • How to read relevant research article • Discuss establishment of cardiogenin field • Discuss formation of septum in atrioventricular canal		Explain importance of septum spurium	C2		
tube) • Discuss different methods of septum formation • Explain septum formation in right atrium C2 • Describe development and differentiation of atria • Discuss related congenital abnormalities • To understand the Biophysiological aspects • Able to focus on provision of curative and preventive health care measures • Practice the principles of Bioethics • Apply strategic use of AI in health care • How to read relevant research article • Discuss establishment of cardiogenin field C2 • Discuss formation of septum in atrioventricular canal		Describe development of cardiac septa	C2	LGIS	
Describe development and differentiation of atria Discuss related congenital abnormalities To understand the Biophysiological aspects Able to focus on provision of curative and preventive health care measures Practice the principles of Bioethics Apply strategic use of AI in health care How to read relevant research article Discuss establishment of cardiogenin field Discuss formation of septum in atrioventricular canal C2		Discuss different methods of septum formation	C2		VIVA
Discuss related congenital abnormalities To understand the Biophysiological aspects Able to focus on provision of curative and preventive health care measures Practice the principles of Bioethics Apply strategic use of AI in health care Apply strategic use of AI in health care One How to read relevant research article Discuss establishment of cardiogenin field Discuss formation of septum in atrioventricular canal C3 Discuss formation of septum in atrioventricular canal		• Explain septum formation in right atrium	C2		
• To understand the Biophysiological aspects • Able to focus on provision of curative and preventive health care measures • Practice the principles of Bioethics • Apply strategic use of AI in health care • How to read relevant research article • Discuss establishment of cardiogenin field • Discuss formation of septum in atrioventricular canal		Describe development and differentiation of atria	C2		
Able to focus on provision of curative and preventive health care measures Practice the principles of Bioethics Apply strategic use of AI in health care How to read relevant research article Discuss establishment of cardiogenin field Discuss formation of septum in atrioventricular canal C3 Discuss formation of septum in atrioventricular canal C3 C3 C3 C3 C3 C3 C3 C3 C3 C		Discuss related congenital abnormalities	C3		
Practice the principles of Bioethics Apply strategic use of AI in health care Apply strategic use of AI in health care How to read relevant research article Discuss establishment of cardiogenin field Discuss formation of septum in atrioventricular canal C2		To understand the Biophysiological aspects	C3		
Apply strategic use of AI in health care How to read relevant research article Discuss establishment of cardiogenin field Discuss formation of septum in atrioventricular canal C2		• Able to focus on provision of curative and preventive health care measures	C3		
• How to read relevant research article • Discuss establishment of cardiogenin field • Discuss formation of septum in atrioventricular canal C2 • Discuss formation of septum in atrioventricular canal		Practice the principles of Bioethics	C3		
• Discuss establishment of cardiogenin field C2 • Discuss formation of septum in atrioventricular canal C2		Apply strategic use of AI in health care	C3		
• Discuss formation of septum in atrioventricular canal C2		How to read relevant research article	C3		
		Discuss establishment of cardiogenin field	C2		
Development of CVS • Describe formation of atrioventricular valves C2		Discuss formation of septum in atrioventricular canal	C2		
	Development of CVS	Describe formation of atrioventricular valves	C2		
• Explain septum formation in truncusarteriosis&conuscordis C2		• Explain septum formation in truncusarteriosis&conuscordis	C2		

(Formation and partitioning of	Describe septum formation in ventricles Discuss formation of semilunar valves	C2		MCQ
Ventricles)	Discuss development of conducting system of heart	C2	LGIS	SAQ
	Discuss related Congenital abnormalities	C3		VIVA
	To understand the Biophysiological aspects	C3		
	Able to focus on provision of curative and preventive health care measures	C3		
	Practice the principles of Bioethics	C3		
	Apply strategic use of AI in health care	C3		
	How to read relevant research article	C3		
	Describe fetal circulation in detail	C2		
Development of CVS	• Discuss role of foramen ovale, ductus arteriosis and ductus venosis in fetal circulation andtheir fate	C2		
(Fetal circulation)	Differentiate between fetal and postnatal circulation	C2		
	Discuss related Congenital abnormalities	C3		MCQ
	To understand the Biophysiological aspects	C3	LGIS	SAQ
	• Able to focus on provision of curative and preventive health care measures	C3		VIVA
	Practice the principles of Bioethics	C3		
	Apply strategic use of AI in health care	C3		

To	opic	At the End Of The Session Students Should Be Able To:	Learning Domains	Teaching Strategy	Assessment Tools
		Define thorax	C1		
	cic Wall	• Discuss components and shape of thoracic cavity.	C2		
	oracic	Discuss the applied and the related clinical anatomy	C2		MCQ
Ver	rtebra	• Tabulate origin, insertion, nerve supply and action of all muscles of posterior compartment of leg	C2	SGD, Skill Lab	SAQ VIVA
		Classify Ribs	C1		OSPE
		Correlate the clinical conditions	C3		
		• Describe ribs (side determination, features, attachments, relations, types and	C2		
		ossification.			
		Practice the principles of Bioethics	C3		
		Correlate the clinical conditions	C3		
		To understand the Biophysiological aspects of Thoracic wall	C3		
		Able to focus on provision of curative and preventive health care measures	C3		
		Discuss the boundaries and division of mediastinum	C2		MCQ
		Enumerate the contents of anterior mediastinum.	C1		
		Correlate the clinical conditions	C3	SGD,	SAQ
Media	astinum	To understand the Biophysiological aspects of Mediastinum	C3	Skill Lab	VIVA
		Able to focus on provision of curative and preventive health care measures	C3		OSPE
		Map Arch of Aorta, Bracheocephalic artery on SP/Model	P		
		Practice the principles of Bioethics	C3		
		Apply strategic use of AI in health care	C3		
		Describe the gross features of fibrous pericardium with its blood and nerve supply	C2		
		Describe the gross features of serous pericardium with its blood and nerve supply	C2	SGD, Skill Lab	MCQ SAQ
Peric	ardium	Describe transverse and oblique pericardial sinus	C2		VIVA
		Describe the Clinical Significance of the Transverse Pericardial Sinus	C3		OSPE
		Define Pericarditis and Pericardial Effusion	C1		
		Correlate the clinical conditions	C3		
		To understand the Biophysiological aspects of Pericardium	C3		
		Able to focus on provision of curative and preventive health care measures	C3		
		Map Pericardium on SP/Model	C3		

	Practice the principles of Bioethics	C3		
	Apply strategic use of AI in health care	C3		
	Read relevant research article	C3		
	Demonstrate Position and orientation of heart.	P		
Heart (Externalfeatures)	Describe borders and surfaces of the heart.	C2		
	Demonstrate the external features of the heart	C2	SGD,	MCQ
	Correlate the clinical conditions	C3	Skill Lab	SAQ
	• To understand the Biophysiological aspects of Heart(External Feature)	C3		VIVA OSPE
	• Able to focus on provision of curative and preventive health care measures	C3		OSPE
	Practice the principles of Bioethics	C3		
	Apply strategic use of AI in health care	C3		
	Read relevant research article	C3		
	Use HEC digital library	C3		
	Differentiate between muscular and smooth part.	C2		
	• Identify the various openings, important features in inter-atrial septum.	C2		MCQ SAQ VIVA OSPE
	• Identify S.A node	C1	SGD, Skill Lab	
	• Discuss internal features of left atrium, inter atrial septum, mitral valve and	C2		
Heart (Intermalfactures)	pulmonaryveins.			
Heart (Internalfeatures)	Discuss importance of modulator band.	C2		
	• Identify mitral valve, intervetntricular septum, aortic vestibule, arotic valve.	C3		
	Correlate the clinical conditions	C3		
	• To understand the Biophysiological aspects of Heart (Internal features)	C3		
	• Able to focus on provision of curative and preventive health care measures	C3		
	Map Cardiac valves on SP/Model	P		
	Practice the principles of Bioethics	C3		
	Apply strategic use of AI in health care	C3		
	Read relevant research article	C3		
	Use HEC digital library	C3		
Heart	Coronary Atherosclerosis	C1	SGD,	MCQ
(Clinical Correlations)	Myocardial Infarction	C1	Skill Lab	SAQ
	Angina Pectoris	C1		VIVA
	Coronary Angioplasty	C1		OSPE
	Correlate the clinical conditions	C2		

	• To understand the Biophysiological aspects of Heart (Clinical Correlations)	C3		
	Able to focus on provision of curative and preventive health care measures	C3		
	Practice the principles of Bioethics	C3		
	Apply strategic use of AI in health care	C3		
	Read relevant research article	C3		
Vasculature of heart	Describe the origin of coronary arteries	C2		
	• Identify course branches and distribution of right coronary arteries and left	C1		
	coronaryartery,		SGD,	MCQ
	• Discuss the concept of right and left dominance.	C2	Skill Lab	SAQ
	• Describe the venous drainage of heart.	C2		VIVA
	Correlate the clinical conditions	C3		OSPE
	To understand the Biophysiological aspects of Vasculature of heart	C3		
	Able to focus on provision of curative and preventive health care measures	C3		
	Practice the principles of Bioethics	C3		
	Apply strategic use of AI in health care	C3		
Innervation of Heart	Describe the formation of superficial and deep cardiac plexus.	C2	SGD, Skill Lab	
	Correlate the clinical conditions	C3		
	To understand the Biophysiological aspects of Innervation of Heart	C3		MCQ SAQ VIVA OSPE
	• Able to focus on provision of curative and preventive health care measures	C3		
	Practice the principles of Bioethics	C3		
	Apply strategic use of AI in health care	C3		OSPE
	Read relevant research article	C3		
Superior mediastinum	Enumerate the structure of superior mediastinum	C1		
(Trachea, Esophagus,	Describe great vessels in superior mediastinum	C2		
Ascending Aorta)	Correlate the clinical conditions	C3	SGD,	MCQ
	To understand the Biophysiological aspects of Superior Mediastinum	C3	Skill Lab	SAQ
	Able to focus on provision of curative and preventive health care measures	C3		VIVA
	Map Ascending Aorta on SP/Model	P		OSPE
	Practice the principles of Bioethics	C3		
	Apply strategic use of AI in health care	C3		
	Read relevant research article	C3		
	Identify structures in posterior mediastinum	C1		
	Describe anatomy of structure in Posterior mediastinum	C2		

Posterior mediastinum	• Identify course, relations and branches of descending aorta.	C2	SGD,	MCQ
(Boundaries and	Correlate the clinical conditions	C2	Skill Lab	SAQ
Structures	To understand the Biophysiological aspects of Posteror mediastinum	C3		VIVA
	Able to focus on provision of curative and preventive health care measures	C3		OSPE
	Map Descending Thoracic Aorta on SP/Model	P		
	Practice the principles of Bioethics	C3		
	Apply strategic use of AI in health care	C3		
	Read relevant research article	C3		
Posterior mediastinum	Describe formation, course and clinical importance of azygos system of	C3		
(Azygos system)	veins			
	• Describe formation and importance of hemiazygos vein	C1	SGD,	MCQ
	Correlate the clinical conditions	C3	Skill Lab	SAQ
	• To understand the Biophysiological aspects of Posterior mediastinum	C3		VIVA OSPE
	• Able to focus on provision of curative and preventive health care measures	C3		
	Practice the principles of Bioethics	C3		
	Apply strategic use of AI in health care	C3		
	Read relevant research article	C3		
Cross sectional Anatomy/	• Identify the surfaces present at different levels of cross sections	P		
Radiology	Manubriosternal Joint/Angle of Louis	P		
	Upper body of Sternum	P	a a b	
	• Section between T 7, T 8 Thoracic vertebrae	P	SGD,	SAQ VIVAOSPE
	• Section between T 8, T 9 Thoracic vertebrae	P	Skills lab	
	• Section between T 9, T 10 Thoracic vertebrae	P	7	
	How to access HEC digital library	C3		
	Correlate the clinical conditions	C2	7	
	Able to focus on provision of curative and preventive health care measures	C3		
	Practice the principles of Bioethics	C3		
	Apply strategic use of AI in health care	C3		
	Read relevant research article	C3		

Topics	Learning objectives		Learning Resources
	Define thorax	Clinically Ori	ented Anatomy6th Edition,
	• Discuss components and shape of thoracic cavity.	Pg no.73,77,	
Posterior compartment	Discuss the applied and the related clinical anatomy	84,89,93,95,9	
of leg and flexor	Classify Ribs		.be/PoA-Uq9w-7s https://youtu.be/Ok8-
retinaculum	• Describe ribs (side determination, features, attachments, relations, types and ossification.		ttps://www.sciencedirect.com/science/a
	Discuss the applied and the related clinical anatomy		
	How to access HEC digital library		
	How to read relevant research article		
	Define thorax	Clinically Orio	ented Anatomy6th Edition, P
	Discuss components and shape of thoracic cavity.		8,127,128,132-133,160-168,171
Mediastinum	Discuss the applied and the related clinical anatomy		oe/oBR9p_UDTuo
	How to read relevant research article	https://www.n	cbi.nlm.nih.gov/pmc/articles/PMC5111324/
	• Describe the gross features of fibrous pericardium with its bloodand nerve supply		ented Anatomy6th Edition, 3-129,133-134
	• Describe the gross features of serous pericardium with its bloodand nerve supply	https://www.	.be/5RMeCgJn730 .sciencedirect.com/science/a
Pericardium	Describe transverse and oblique pericardial sinus	rticle/abs/pii/	<u>/S1054880721000302</u>
	Describe the Clinical Significance of the Transverse PericardialSinus		
	Define Pericarditis and Pericardial Effusion		
	How to access HEC digital library		
	How to read relevant research article		
	Demonstrate Position and orientation of heart.	Clinically Ori	ented Anatomy6th Edition,
	Describe borders and surfaces of the heart.		5-137,144-149,153-159,171-172
Heart I External features	Demonstrate the external features of the heart		.be/uhSBFOTwzDQ
	How to access HEC digital library	-	ahajournals.org/doi/full/10.
	How to read relevant research article	<u>1161/JAHA.</u>	122.028014
Heart II Internal features	Differentiate between muscular and smooth part.	Clinically Ori	ented Anatomy6th Edition,
	• Identify the various openings, important features in inter-atrialseptum.	*	5-137,144-149,153-159,171-172
	Identify S.A node		pe/uhSBFOTwzDQ
	How to access HEC digital library		hajournals.org/doi/full/10.
	How to read relevant research article	<u>1161/JAHA.1</u>	22.028014

Heart III Clinical Co- Relation	• Discuss internal features of left atrium, inter atrial septum, mitralvalve and pulmonary veins.	•	Clinically Oriented Anatomy6th Edition, P no.129,135-137,144-149,153-159,171-172 https://youtu.be/uhSBFOTwzDQ https://www.ahajournals.org/doi/full/10.1161/JAHA.122.028014
Heart III Clinical Co- Relation	 Discuss importance of modulator band. Identify mitral valve, intervetntricular septum, aortic vestibule, arotic valve. How to access HEC digital library How to read relevant research article 	•	Clinically Oriented Anatomy6th Edition, P no.129,135-137,144-149,153-159,171-172 https://youtu.be/uhSBFOTwzDQ https://www.ahajournals.org/doi/full/10.1161/JAHA.122.028014
Vasculature of heart	 Describe the origin of coronary arteries Identify course branches and distribution of right coronary arteries and left coronary artery, Discuss the concept of right and left dominance. Describe the venous drainage of heart. Discuss the related applied and clinical anatomy How to access HEC digital library How to read relevant research article 	•	Clinically Oriented Anatomy6th Edition, P no.129,135-137,144-149,153-159,171-172 https://youtu.be/uhSBFOTwzDQ https://www.ahajournals.org/doi/full/10.1161/JAHA.122.028475
Innervation of heart	 Describe the formation of superficial and deep cardiac plexus. How to access HEC digital library How to read relevant research article 	•	Clinically Oriented Anatomy6th Edition, P no.129,135-137,144-149,153-159,171-172 https://youtu.be/uhSBFOTwzDQ https://www.ahajournals.org/doi/full/10.1161/JAHA.122.028932
Superior mediastinum (Trachea, Esophagus, Ascending Aorta)	 Enumerate the structure of superior mediastinum Describe great vessels in superior mediastinum How to access HEC digital library How to read relevant research article 	•	Clinically Oriented Anatomy6th Edition, P no.127-128,132,160-166,179 https://youtu.be/2POIIBe2xR4 https://www.sciencedirect.com/science/artic_le/abs/pii/S1472029906000336
Posterior mediastinum I	 Identify structures in posterior mediastinum Describe anatomy of structure in Posterior mediastinum Identify course, relations and branches of descending aorta. How to access HEC digital library How to read relevant research article 	•	Clinically Oriented Anatomy6th Editio n, P no. 128, 168-172, 179 https://youtu.be/2POIIBe2xR4 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9792830/
	Describe formation, course and clinical importance of azygossystem of veins	•	Clinically Oriented Anatomy6th Edition, P

	Describe formation and importance of hemiazygos vein	no. 128, 168-172, 179
Surface anatomy	How to access HEC digital library	https://youtu.be/2POIIBe2xR4
/ Radiology	How to read relevant research article	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9792830/
	Demonstrate surface projection and radiological aspects of heart, great	
	vessels, trachea, oesphagus, postion of heart valves	P no.129,135-137,144-149,153-159,171-172
	How to access HEC digital library	• <u>https://youtu.be/wqiK-8nZEqk</u>
	How to read relevant research article	https://pubs.rsna.org/doi/10.1148/ryct.220047

	Practicals			
Topic	Learning Objectives	Learning Domain	Teaching Strategy	Assessment Tool
	At The End Of Practical Students Should Be Able To			
	• identify characteristic histological features of tunica intima, tunica media and tunica adventitia of elastic arteries under microscope	P1		
	Illustrate histological structure of elastic artery	C1	Skill lab	OSPE
Elastic Arteries	Write two points of identification	C1		
	To read relevant research article	C3		
	identify characteristic histological features of tunica intima, tunica media and tunica adventitia of muscular and small sized arteries arteries under microscope	P1		
Muscular Arteries	Illustrate histological structure of Muscular and small sized artery	C1	Skill lab	OSPE
Small Arteries	Write two points of identification	C1		
	Differentiate between three types of arteries on histology slides	C1		
	To read relevant research article	C3		
	Identify characteristic histological features of tunica intima, tunica media and tunica adventitia of large vein under microscope	P1		
Large Vein	Illustrate histological structure of large vein	C1	- Skill lab	OSPE
	Write two points of identification	C1		
Muscular Arteries Small Arteries Large Vein	 Write two points of identification Differentiate between three types of arteries on histology slides To read relevant research article Identify characteristic histological features of tunica intima, tunica media and tunica adventitia of large vein under microscope Illustrate histological structure of large vein 	C1 C1 C3 P1		

		To read relevant research article	C3		
		Identify characteristic histological features of tunica intima, tunica media and tunica adventitia of medium and small sized vein under microscope	P1		
	Medium and small	Illustrate histological structure of medium and small sized vein	C1		0.077
	sized vein	Write two points of identification Differentiate between three types of veinson histology slides	C1	Skill lab	OSPE
		To read relevant research article	C3		
		Classify capillaries on the basis of histological structure and function	C1		
	Capillaries	Enlist sites of continuous, fenestrated and sinusoidal capillaries	C1	Skill lab	OSPE
		Elaborate characteristic histological features of tunica intima, tunica mediaand tunica adventitia of capillaries	C1		
		Draw and label histological structure of each type of capillaries	C1		
		Write two points of identification	C1		
		To read relevant research article	C3		

		Physiology				
		Theory				
Topics	Learning Objectives	References	Learning Resources	Learning Domains	Learning Strategy	Assessment Tools
Introduction to CVS	1. Describe scheme of circulation through the heart and body	 Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.CardiovascularPhysiology (Chapter 14, Page 469) Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4, Page 117) Physiological Basis of Medical Practiceby Best & Taylor's.13th Edition.Section 02, (Chapter 05, Page 101) 	 https://youtu.be/28CYhgjrB LA https://training.seer.cancer .gov/ anatomy/cardiovascular/#: ~:tex t=The%20cardiovascular %20s ystem%20is%20sometime s,art eries%2C%20veins%2C% 20and%20capillaries. 	1.C1	LGIS	MCQSEQ VIVA VOCE MCQ (LMS based Aseessment, MSTbased Assessment) OSPE
Classification of blood vessels & Biophysical considerations	1.Enumerate Classification of blood vessels. 2.Explain structure and functions of types of blood vessels	 Ganong's Review of Medical Physiology.25TH Edition.Section 05, Cardiovascular Physiology (Chapter 31, Page 567,571) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 15, Page 513) Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4, Page 119) Physiological Basis of Medical 	https://youtu.be/ar2_UPiGz_mU https://training.seer.cancergov/ anatomy/cardiovascular/bl_ood/_classification.html	C1 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE

Heart Sounds	Describe four heart sound and differences between 1st and 2nd heart sounds	Practice by Best & Taylor's.13th Edition.Section 04 (Chapter 15, Page 183) • Ganong's Review of Medical Physiology.25TH Edition.Section 05, Cardiovascular Physiology (Chapter 30, Page 542) • Textbook of Medical Physiology by Guyton & Hall.14th Edition.Section 04. (Chapter 23, Page 283)	 https://youtu.be/dBwr2G ZCm QM https://www.utmb.edu/pedi ed /CoreV2/Cardiology/cardiolog yV2/cardiologyV23.html 	C1/C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Regulation of blood flow	Define and describe Resistance to Blood flow Describe regulation of Blood pressure and Poiseuilles law Describe factors related with Blood viscosity and its role in regulation	 Ganong's Review of Medical Physiology.25TH Edition.Section 05, Cardiovascular Physiology (Chapter 31, Page 575) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 02(Chapter 5, Page 107) (Chapter 6,page 110) Textbook of Medical Physiology by Guyton & Hall.14th Edition.Section 04. (Chapter 14, Page 173) (Chapter 17, Page 205) 	 https://youtu.be/cocB- M3h9k0 https://journals.physiology .org/ doi/full/10.1152/advan.00 074.2 010 	C1 C1 C1	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE

Capill circulation, of vasomor starling to	Concept forces in different pathological conditions	 Ganong's Review of Medical Physiology.25TH Edition.Section 05,(Chapter 31, Page 577) Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 170) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 02(Chapter 6,Page 119) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 04. (Chapter 16, Page 193) 	1. https://youtu.be/YNROPn Yy1t c 2. https://www.osmosis.org/learn/Microcirculation and Starling forces	C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Functions of Venous ret factors aft venous r	ecting Explain Various factors that affect venous return	 Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 158) Textbook of Medical Physiology by Guyton & Hall.14th Edition.Section 4. (Chapter 15, Page 188) 	 https://youtu.be/FKJr5uqPv <u>5s</u> https://www.sciencedirect.c <u>om</u> /topics/medicine-and- <u>dentistry/venous-return</u> 	C1 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE

Introduction to ECG & its clinical importance	Enumerate and describe normal components of ECG Draw normal ECG Describe the method of recording ECG Describe the following. Bipolar limb leads.	 Ganong's Review of Medical Physiology.25TH Edition.Section 01,Immunity,Infection and Inflamma tion(Chapter 29, Page 522) 	 https://youtu.be/SEFhbK 8ZCg k https://my.clevelandclini c.org/ health/diagnostics/16953- electrocardiogram-ekg 	C1 C1 C1 C1 C1 C1 C1 C1	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST
	Describe Einthovians law and Enthovian triangle. Describe Chest leads and Augmented unipolar limb leads Describe how to read normal ECG Describe the principles of vectorial analysis of ECG. Describe the vectorial analysis of normal ECG	 Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 14,Page 491) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Chapter 09,Page 170) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 03. (Chapter 11, Page 135) 		C1		based Assessment) OSPE
Cardiac output & its control, measurement of cardiac output, pathologically high and low cardiac output	Explain cardiac output Understand various method to measure cardiac output Explain various factor which help in regulation of heart rate and stroke volume	 Ganong's Review of Medical Physiology.25TH Edition.Section 05,(Chapter 30, Page 543) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 14,Page 500-507) Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 149,154-158) 	https://youtu.be/WuGMqe zV3e o https://teachmephysiology. com /cardiovascular- system/cardiac-output/	C2 C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE

	tl analysis vectoria ythmias I Describ analysis Define a	oe the principles of al analysis of ECG. be the vectorial s of normal ECG arrhythmia Describe hal sinus rhythms	Guyton & Hall.14th Edition. Section 04. (Chapter 20, Page 245)((Chapter 22, Page 280) Ganong's Review of Medical Physiology.25TH Edition. Section 05(Chapter 29, Page 526) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 09, Page 179, 180-189) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 03. Chapter 12, Page 143)((Chapter 13, Page 157)	1. https://www.brainkart.co m/arti_cle/Principles-of- Vectorial- Analysis-of- Electrocardiograms_1924 1/ 2. https://youtu.be/6LrptveKY us 3. https://www.medicalnewsto day .com/articles/8887#definition	C1 C1 C1	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Events of cycle grap	cycle - I, Enumer events	rate and explain its the events of	Ganong's Review of Medical Physiology.25TH Edition.Section 05,(Chapter 30, Page 537) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 14,Page 495- 500) Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 154)	https://youtu.be/XbivIaFPo QI https://www.sciencedirect.com /science/article/pii/S0010027 7 21003309 https://youtu.be/sLLLOaZ85Lk https://teachmephysiology.com/cardiovascular-system/cardiac-cycle-2/cardiac-cycle/	C1 C1, C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE

Arrhythmias II	Describe abnormal rhythms resulting from the block of heart signals within the intra cardiac conduction pathways Define ectopic beats Explain the following with the help of relevant ECGs. Premature contractions. Paroxysmal tachycardia. Ventricular fibrillation. Atrial fibrillation. Atrial flutter. Cardiac arrest. Describe different degrees of heart block and ECG changes Explain atrial and ventricular flutter and fibrillation	 Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 03. (Chapter 9, Page 117) Ganong's Review of Medical Physiology.25TH Edition.Section 05(Chapter 29, Page 527) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.(Chapter 09,Page 180-189) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 03. (Chapter 13, Page 157) 	5. https://youtu.be/6LrptveKY 2. https://www.medicalnewstoday https://www.medicalnewstoday
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		Physiology (Chapter 4,Page 154) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 03. (Chapter 9, Page 117-126)	/cardiovascular- system/cardiac-cycle- 2/cardiac-cycle/			
ECG changes in myocardial hypertrophies, ischemic heart disease	Discuss ECG changes in different diseases	 Ganong's Review of Medical Physiology.25TH Edition.Section 05(Chapter 29, Page 532) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.(Chapter 12,Page 151) 	 https://youtu.be/SEFhbK 8ZCg k https://youtu.be/D0V_aQ XtRS w https://www.msdmanuals. com/ home/heart-and- blood-vessel- disorders/diagnosis-of- heart- and-blood-vessel- disorders/electrocardiogra phy 	1.C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE

Short term regulation of blood pressure	Explain short term regulation of blood pressure Explain central nervous system ischemic response & cushing reaction	 Ganong's Review of Medical Physiology.25TH Edition.Section 05(Chapter 32, Page 585,590) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 15,Page 517,528) Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 163) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.(Chapter 18,Page 217) 	 https://youtu.be/HUf1LtkPj 1k https://www.sciencedirect.com//topics/nursing-and-health-professions/blood-pressure-regulation https://www.cliffsnotes.com//st/udy-guides/anatomy-and-physiology/the-cardiovascular-system/control-of-blood-pressure 	C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Congestive cardiac failure	Define cardiac failure. Classify cardiac failure Enumerate the causes of cardiac failure and discuss in detail. Discuss and differentiate between compensated heart failure and decompensated heart failure Discuss and differentiate between Low and high output cardiac failure Define Cardiac reserve.	 Ganong's Review of Medical Physiology.25TH Edition.Section 05(Chapter 30, Page 538) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.(Chapter 22,Page 271) 	 https://www.webmd.com/heart disease/guide-heart-failure https://youtu.be/EDCaFKgtXks https://www.healthline.com/heart-failure 	C1/C2 C1 C2 C2 C1	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE

Long term regulation of blood pressure	Explain the role of kidneys in long term regulation of blood pressure	 Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 163) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 16,page 282) Textbook of Medical Physiology by Guyton & Hall.14th Edition. (Chapter 19, Page 229) 	 https://youtu.be/5S9xEp <u>AdAg A</u> https://jps.biomedcentral.c om/a rticles/10.1007/s12576- 012- 0192-0 https://onlinelibrary.wiley.c om /doi/10.1111/j.1440- 1681.2005.04205.x 	C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Splanchnic circulation, cutaneous circulation	Describe the Physiologic anatomy of cerebral blood flow Describe the blood flow in normal state and local control of blood flow	 Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 173) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 7,page 146) 	1. https://youtu.be/hr6oGuW 7mV A 2. https://www.sciencedirect.com /topics/medicine-and- dentistry/splanchnic-blood- flow 3. https://www.ncbi.nlm.nih. gov/ pmc/articles/PMC299929 0/	C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Skeletal muscle blood flow, Cardiovascular changes during exercise	Discuss the blood flow regulation in skeletal muscle at rest and during exercise.	Ganong's Review of Medical Physiology.25TH Edition.Section 05(Chapter 30, Page 549) Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 178) Physiological Basis of Medical	1. https://www.sciencedirect.com//topics/medicine-and-dentistry/muscle-blood-flow/flow/2. https://youtu.be/H6Fd8sfE2eQ	C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE

		Practice by Best & Taylor's.13th Edition.(Chapter 07,Page 148) Textbook of Medical Physiology by Guyton & Hall.14th Edition (Chapter 18, Page 226)(Chapter 21,Page 259)				
Fetal circulation & cardiac abnormalities in fetal circulation	Describe the fetal circulation Discuss the pathophysiology of cardiac abnormalities related to it	 Ganong's Review of Medical Physiology.25TH Edition.Section 05(Chapter 33, Page 614) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 4(Chapter 23,Page 288) 	1. https://youtu.be/rYVGjbzm Atg 2. https://www.sciencedirect.com /science/article/abs/pii/00330 6 2072900151 3. https://myhealth.ucsd.edu/ Con ditions/Heart/Congenital/ 90,P0 1790	C1 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Circulatory Shock	Define shock. Describe the physiologic causes of shock. Enumerate various types of shock. Describe the stages of shock Describe the following types of shock in detail. Describe Circulatory shock and Hypovolemic shock. Describe Neurogenic shock. Describe Septic shock. Describe Anaphylactic shock	Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 4(Chapter 24,Page 293)	1.https://youtu.be/VZtBOaA MG 9w 2. https://my.clevelandclinic. org/ health/diseases/17837- cardiogenic-shock	1.C1 2.C1 3.C1 4.C1 5.C1 6.C1 7.C1 8.C1 9.C1	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE

Coronary circulation, Atherosclerosis & acute coronary occlusion	Understand the physiologic anatomy of coronary blood supply and normal coronary blood flow Discuss the control of coronary blood flow	Ganong's Review of Medical Physiology.25TH Edition.Section 05(Chapter 33, Page 610) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.(Chapter 15,Page 265) Textbook of Medical Physiology by Guyton & Hall.14th Edition (Chapter 21, Page 262)	 https://www.msdmanuals.com/ professional/cardiovascul ar- disorders/coronary- artery- disease/overview- of-coronary- artery- disease https://youtu.be/WKrVxK JVh0 0 https://www.uptodate.com/cont_ents/mechanisms-of-acute- coronary- syndromes-related- to-atherosclerosis 	1.C2 2.C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Cardiac cycle, Events of cardiac cycle and its graphical representation, Functions of ventricles as pumps, aortic pressure curve, regulation of heart pumping (SDL)	Describe the cardiac cycle in detail Enumerate and explain its events Explain the events of cardiac cycle	 Ganong's Review of Medical Physiology.25TH Edition.Section 05,(Chapter 30, Page 537) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 14,Page 495- 500) Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 154) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 03. (Chapter 9, Page 117) 	 https://youtu.be/XbivIaFPo QI https://www.sciencedirect.com /science/article/pii/S0010027 7 21003309 https://youtu.be/sLLLOaZ8 5Lk https://teachmephysiology.com /cardiovascular-system/cardiac-cycle-2/cardiac-cycle/ https://youtu.be/HNkwXZ SSss U 	C1 C1/C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE

Capillary circulation, Concept of vasomotion and starling forces	Explain the details of types of starling forces. Expalin role of starling forces in different pathological conditions	 Textbook of Medical Physiology by Guyton & Hall.14th Edition.Section 04. (Chapter 14, Page 173) (Chapter 17, Page 205) Ganong's Review of Medical Physiology.25TH Edition.Section 05,(Chapter 31, Page 577) Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 170) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 02(Chapter 6,Page 119) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 04. (Chapter 16, Page 193) 	https://youtu.be/YNROPnYy1t c 2. https://www.osmosis.org/learn/ Microcirculation and Starling forces	C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Functions of veins, Venous return and factors affecting venous return	Describe how veins are different from arteries Explain Various factors that affect venous return	 Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 158) Textbook of Medical Physiology by Guyton & Hall.14th Edition.Section 4. (Chapter 15, Page 188) 	 https://youtu.be/FKJr5uqPv5s https://www.sciencedirect.com/topics/medicine-and-dentistry/venous-return 	C1 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Introduction to ECG & its clinical importance	Enumerate and describe normal components of ECG Draw normal ECG Describe the method of recording ECG Describe the following. Bipolar limb leads.	Ganong's Review of Medical Physiology.25 TH Edition.Section 01,Immunity,Infection and Inflamma tion(Chapter 29, Page 522)	https://youtu.be/SEFhbK8ZCg k https://my.clevelandclinic.org/ health/diagnostics/16953- electrocardiogram-ekg	C1 C1 C1 C1 C1 C1 C1	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST

	Describe Einthovians law and Enthovian triangle. Describe Chest leads and Augmented unipolar limb leads Describe how to read normal ECG Describe the principles of vectorial analysis of ECG. Describe the vectorial analysis of normal ECG	 Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 14,Page 491) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Chapter 09,Page 170) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 03. (Chapter 11, Page 135) 		C1		based Assessment) OSPE
Cardiac output & its control, measurement of cardiac output, pathologically high and low cardiac output	help in regulation of heart rate and stroke volume	 Ganong's Review of Medical Physiology.25TH Edition.Section 05,(Chapter 30, Page 543) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 14,Page 500-507) Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 149,154-158) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 04. (Chapter 20, Page 245)((Chapter 22, Page 280) 	1. https://youtu.be/WuGMqezV3e 0 2. https://teachmephysiology.com /cardiovascular- system/cardiac-output/	C2 C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Vectorial analysis & arrhythmias I	Describe the principles of vectorial analysis of ECG. Describe the vectorial analysis of normal ECG Define arrhythmia Describe abnormal sinus rhythms	 Ganong's Review of Medical Physiology.25TH Edition.Section 05(Chapter 29, Page 526) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.(Chapter 09,Page 179,180-189) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 03. 	 https://www.brainkart.com/article/Principles-of-Vectorial-Analysis-of-Electrocardiograms 19241/ https://youtu.be/6LrptveKYus https://www.medicalnewstoday.com/articles/8887#definition 	C1 C1 C1 C1	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment)

		(Chapter 12, Page 143)((Chapter 13, Page 157)				OSPE
Cardiac cycle I, Events of cardiac cycle and its graphical representation	Explain the events of cardiac cycle	 Ganong's Review of Medical Physiology.25TH Edition.Section 05,(Chapter 30, Page 537) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 14,Page 495-500) Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 154) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 03. (Chapter 9, Page 117) 	 https://youtu.be/XbivIaFPoQI https://www.sciencedirect.com /science/article/pii/S00100277 21003309 https://youtu.be/sLLLOaZ85Lk https://teachmephysiology.com /cardiovascular- system/cardiac-cycle- 2/cardiac-cycle/ https://youtu.be/HNkwXZSSss U 	C1 C1, C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Arrhythmias	Describe abnormal rhythms resulting from the block of heart signals within the intra cardiac conduction pathways Define ectopic beats Explain the following with the help of relevant ECGs. I Premature contractions. Paroxysmal tachycardia. Ventricular fibrillation. Atrial fibrillation. Atrial flutter. Cardiac arrest. Describe different degrees of heart block and ECG changes Explain atrial and ventricular flutter and fibrillation	 Ganong's Review of Medical Physiology.25TH Edition.Section 05(Chapter 29, Page 527) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.(Chapter 09,Page 180-189) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 03. (Chapter 13, Page 157) 	https://youtu.be/6LrptveKYus https://www.medicalnewstoday .com/articles/8887#definition	C1 C1 C2 C2 C2 C2 C2 C2 C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE

Cardiac c II, Functi ventricle pumps, a pressure regulation	ons of es as a cortic curve, on of	 Ganong's Review of Medical Physiology.25TH Edition.Section 05,(Chapter 30, Page 537) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 14,Page 495-500) Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 154) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 03. (Chapter 9, Page 117-126) 	 https://youtu.be/dmPtaJxgRQU https://youtu.be/VI9zo_CzQ9g https://youtu.be/pli2zs8Kekw https://youtu.be/kMJ-US6Qfqc https://youtu.be/qhtAhbyBSfs https://teachmephysiology.com/cardiovascular-system/cardiac-cycle-2/cardiac-cycle/ 	C1 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
ECG cha in myoca hypertroj ischemic disea	ordial phies, heart	 Ganong's Review of Medical Physiology.25TH Edition.Section 05(Chapter 29, Page 532) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.(Chapter 12,Page 151) 	 https://youtu.be/SEFhbK8ZCg k https://youtu.be/D0V_aQXtRS w https://www.msdmanuals.com/home/heart-and-blood-vessel-disorders/diagnosis-of-heart-and-blood-vessel-disorders/electrocardiography 	1.C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Short to regulation blood pre	on of reaction	 Ganong's Review of Medical Physiology.25TH Edition.Section 05(Chapter 32, Page 585,590) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 15,Page 517,528) Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 163) 	 https://youtu.be/HUf1LtkPj1k https://www.sciencedirect.com/topics/nursing-and-health-professions/blood-pressure-regulation https://www.cliffsnotes.com/study-guides/anatomy-and-physiology/the-cardiovascular- 	C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE

Congestive cardiac failure	Define cardiac failure. Classify cardiac failure Enumerate the causes of cardiac failure and discuss in detail. Discuss and differentiate between compensated heart failure and decompensated heart failure Discuss and differentiate between Low and high output cardiac failure Define Cardiac reserve.	 Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.(Chapter 18,Page 217) Ganong's Review of Medical Physiology.25TH Edition.Section 05(Chapter 30, Page 538) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.(Chapter 22,Page 271) 	system/control-of-blood-pressure 1. https://www.webmd.com/heart-disease/guide-heart-failure 2. https://youtu.be/EDCaFKgtXks 3. https://www.healthline.com/health/congestive-heart-failure	C1/C2 C1 C2 C2 C1	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Long term regulation of blood pressure	Explain the role of kidneys in long term regulation of blood pressure	 Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 163) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 16,page 282) Textbook of Medical Physiology by Guyton & Hall.14th Edition. (Chapter 19, Page 229) 	 https://youtu.be/5S9xEpAdAg <u>A</u> https://jps.biomedcentral.com/a rticles/10.1007/s12576-012- <u>0</u>192-0 https://onlinelibrary.wiley.com /doi/10.1111/j.1440- <u>1</u>681.2005.04205.x 	C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment)
Splanchnic circulation, cutaneous circulation	Describe the Physiologic anatomy of cerebral blood flow Describe the blood flow in normal state and local control of blood flow	 Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 173) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 7,page 146) 	https://youtu.be/hr6oGuW7mV A https://www.sciencedirect.com /topics/medicine-and- dentistry/splanchnic-blood- flow	C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment)

			3. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2999290/			OSPE
Skeletal muscle blood flow, Cardiovascular changes during exercise	Discuss the blood flow regulation in skeletal muscle at rest and during exercise.	Ganong's Review of Medical Physiology.25 TH Edition.Section 05(Chapter 30, Page 549) Physiology by Linda S. Costanzo 6 th Edition.Cardiovascular Physiology (Chapter 4,Page 178) Physiological Basis of Medical Practice by Best & Taylor's.13 th Edition.(Chapter 07,Page 148) Textbook of Medical Physiology by Guyton & Hall.14 th Edition (Chapter 18, Page 226)(Chapter 21,Page 259)	 https://www.sciencedirect.com /topics/medicine-and- dentistry/muscle-blood-flow https://youtu.be/H6Fd8sfE2eQ 	C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Fetal circulation & cardiac abnormalities in fetal circulation	Describe the fetal circulation Discuss the pathophysiology of cardiac abnormalities related to it	 Ganong's Review of Medical Physiology.25TH Edition.Section 05(Chapter 33, Page 614) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 4(Chapter 23,Page 288) 	 https://youtu.be/rYVGjbzmAtg https://www.sciencedirect.com /science/article/abs/pii/003306 2072900151 https://myhealth.ucsd.edu/Con ditions/Heart/Congenital/90,P0 1790 	C1 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Circulatory Shock	Define shock. Describe the physiologic causes of shock. Enumerate various types of shock. Describe the stages of shock Describe the following types of shock in detail.	Physiological Basis of Medical Practice by Best & Taylor's.13 th Edition.Section 4(Chapter 24,Page 293)	1. https://youtu.be/VZtBOaAMG 9w 2. https://my.clevelandclinic.org/health/diseases/17837-cardiogenic-shock	1.C1 2.C1 3.C1 4.C1 5.C1 6.C1 7.C1 8.C1 9.C1	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST

	Describe Circulatory shock and Hypovolemic shock. Describe Neurogenic shock. Describe Septic shock. Describe Anaphylactic shock					based Assessment) OSPE
Coronary circulation, Atherosclerosis & acute coronary occlusion	Understand the physiologic anatomy of coronary blood supply and normal coronary blood flow Discuss the control of coronary blood flow	Ganong's Review of Medical Physiology.25 TH Edition.Section 05(Chapter 33, Page 610) Physiological Basis of Medical Practice by Best & Taylor's.13 th Edition.(Chapter 15,Page 265) Textbook of Medical Physiology by Guyton & Hall.14 th Edition (Chapter 21, Page 262)	https://www.msdmanuals.com/ professional/cardiovascular- disorders/coronary-artery- disease/overview-of-coronary- artery-disease https://youtu.be/WKrVxKJVh0 0 https://www.uptodate.com/contents/mechanisms-of-acute-coronary-syndromes-related-to-atherosclerosis	1.C2 2.C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Cardiac cycle, Events of cardiac cycle and its graphical representation, Functions of ventricles as pumps, aortic pressure curve, regulation of heart pumping (SDL)	Describe the cardiac cycle in detail Enumerate and explain its events Explain the events of cardiac cycle	 Ganong's Review of Medical Physiology.25TH Edition.Section 05,(Chapter 30, Page 537) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 14,Page 495-500) Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 154) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 03. (Chapter 9, Page 117) 	 https://youtu.be/XbivIaFPoQI https://www.sciencedirect.com /science/article/pii/S00100277 21003309 https://youtu.be/sLLLOaZ85Lk https://teachmephysiology.com /cardiovascular- system/cardiac-cycle- 2/cardiac-cycle/ https://youtu.be/HNkwXZSSss U 	C1 C1/C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE

Topics	Learning Objectives	References	Learning Resources	Learning Domains	Learning Strategy	Assessment Tools
Capillary circulation Concept of vasomotic and starling forces	f n	 Ganong's Review of Medical Physiology.25TH Edition.Section 05,(Chapter 31, Page 577) Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 170) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 02(Chapter 6,Page 119) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 04. (Chapter 16, Page 193) 	3. https://youtu.be/YNROPnYy1tc 4. https://www.osmosis.org/learn/Microcirculation_and_Starling_forces	C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE
Short terr regulation blood press	of system ischemic response &	 Ganong's Review of Medical Physiology.25TH Edition.Section 05(Chapter 32, Page 585,590) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 15,Page 517,528) Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 163) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.(Chapter 18,Page 217) 	 4. https://youtu.be/HUf1LtkPj1k 5. https://www.sciencedirect.com/topics/nursing-and-health-professions/blood-pressure-regulation 6. https://www.cliffsnotes.com/study-guides/anatomy-and-physiology/the-cardiovascular-system/control-of-blood-pressure 	C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE

Long term regulation of blood pressure	Explain the role of kidneys in long term regulation of blood pressure •	Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 163) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 16,page 282) Textbook of Medical Physiology by Guyton & Hall.14th Edition. (Chapter 19, Page 229)	 https://youtu.be/5S9xEpAd https://jps.biomedcentral.co rticles/10.1007/s12576-012 0192-0 https://onlinelibrary.wiley.c/doi/10.1111/j.1440- 1681.2005.04205.x 	om/a 2- com	LC	MCQ SEQ VIVA VOCE MCQ GIS (LMS based Aseessment, MST based Assessment) OSPE
Topics Of SD	L Learning Objective	References	Learning Resources	Learning Domains	Learning Strategy	Assessment Tool
ON CAMPU Heart Sounds		 Ganong's Review of Medical Physiology.25TH Edition.Section 05, Cardiovascular Physiology (Chapter 30, Page 542) Textbook of Medical Physiology by Guyton & Hall.14th Edition.Section 04. (Chapter 23, Page 283) 	1. https://youtu.be/dBwr2 2.			

Introduction to ECG & its clinical importance	 Enumerate and describe normal components of ECG Draw normal ECG Describe the method of recording ECG Describe the following. Bipolar limb leads. 	Ganong's Review of Medical Physiology.25 TH Edition.Section 01,Immunity,Infection and Inflamma tion(Chapter 29, Page 522)	 https://youtu.be/SEFhbK8 ZCgk https://my.clevelandclinic .o rg/health/diagnostics/169 53 -electrocardiogram-ekg 	C1 C1 C1 C1 C1 C1 C1	SDL	MCQSEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment)OSPE SDL Evaluation
	 Describe Einthovians law and Enthovian triangle. Describe Chest leads and Augmented unipolar limb leads Describe how to read normal ECG Describe the principles of vectorial analysis of ECG. Describe the vectorial analysis of normal ECG Describe the cardiac cycle 	 Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 14,Page 491) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Chapter 09,Page 170) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 03. (Chapter 11, Page 135) Ganong's Review of Medical 	1.https://youtu.be/XbivIaF	C1 C1 C1 C1 C1 C1 C1 C1		
Cardiac cycle - I, Events of cardiac cycle and its graphical representation	in detail Enumerate and explain its events Explain the events of cardiac cycle	 Physiology.25TH Edition.Section 05,(Chapter 30, Page 537) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 14,Page 495-500) Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 154) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section (Chapter 9, Page 117) 	PoQI 1. https://www.sciencedirec t.c om/science/article/pii/S0 01 0027721003309 2. https://youtu.be/sLLLOa Z8 5Lk 3. https://teachmephysiolog y. com/cardiovascular- system/cardiac-cycle- 2/cardiac-cycle/ 4. https://youtu.be/HNkwXZ S	C1 2. C1/ C2 3. C2	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE SDL Evaluation

Arrhythn	Describe the principles of vectorial analysis of ECG. Describe the vectorial analysis of normal ECG Define arrhythmia Describe abnormal sinus rhythms	 Ganong's Review of Medical Physiology.25TH Edition.Section 05(Chapter 29, Page 526) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.(Chapter 09,Page 179,180- 189) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 03. (Chapter 12, Page 143)((Chapter 13, Page 157) 	SssU 1.https://www.brainkart.co m/article/Principles-of- Vectorial-Analysis-of- Electrocardiograms_1924 1/ 2.https://youtu.be/6Lrptv e KYus 4. https://www.medicalnewst oday.com/articles/8887#d ef inition	1. C1 2. C1 3. C1 4. C1	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE SDL Evaluation
Congesti cardiac fa		 Ganong's Review of Medical Physiology.25TH Edition.Section 01,Immunity,Infection and Inflamma tion(Chapter 03, Page 67) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 03, Blood(Chapter 21,Page 371)(Chapter 22,Page 387) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section (Chapter 34, Page 450-452) 	1. https://www.sciencedirect.c om/topics/pharmacology- toxicology-and- pharmaceutical- science/mononuclear- phagocyte-system 2.https://bmcbiol.biomedce ntral.com/articles/10.118 6/ s12915-017-0392-4	1.C2 2.C2	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE SDL Evaluation

Long term regulation of blood pressure	Explain the role of kidneys in long term regulation of blood pressure	 Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 163) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 16,page 282) Textbook of Medical Physiology by Guyton & Hall.14th Edition. (Chapter 19, Page 229) 	 https://youtu.be/5S9xEp <u>Ad AgA</u> https://jps.biomedcentral. <u>co</u> <u>m/articles/10.1007/s1257</u> <u>6- 012-0192-0</u> https://onlinelibrary.wile <u>y.c</u> <u>om/doi/10.1111/j.1440-1681.2005.04205.x</u> 	C2 SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE SDL Evaluation
Skeletal muscle blood flow,	Discuss the blood flow regulation in skeletal muscle at rest and during exercise.	Ganong's Review of Medical Physiology.25TH Edition.Section 05(Chapter 30, Page 549)	1. https://www.sciencedirec t.c om/topics/medicine- and- dentistry/muscle- blood- flow	C2 SDL	MCQ SEQ VIVA VOCE
Cardiovascular changes during exercise		Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 178) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.(Chapter 07,Page 148) Textbook of Medical Physiology by Guyton & Hall.14th Edition (Chapter 18, Page 226)(Chapter 21,Page 259)	2. https://youtu.be/H6Fd8sf E2 eQ		MCQ (LMS based Aseessment, MST based Assessment) OSPE SDL Evaluation

(OFF CAMPUS): Introduction to CVS	1. Describe scheme of circulation through the heart and body 1. Enumerate	 Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.Cardiovascular Physiology(Chapter 14,Page 469) Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 117) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 02,(Chapter 05,Page 101) Ganong's Review of Medical 	1. https://youtu.be/28CYh gjr BLA 2. https://training.seer.cance r. gov/anatomy/cardiovascu la r/#:~:text=The%20cardio va scular%20system%20is% 2 0sometimes,arteries%2C % 20veins%2C%20and%20 ca pillaries. 1. https://youtu.be/ar2_UPi	1.C1	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE SDL Evaluation
Classification of blood vessels & Biophysical considerations	Classification of blood vessels. 2.Explain structure and functions of types of blood vessels	Physiology.25TH Edition.Section 05,Cardiovascular Physiology (Chapter 31, Page 567,571) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 15,Page 513) Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 119) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 04 (Chapter 15,Page 183)	Gz mU 2. https://training.seer.cance r. gov/anatomy/cardiovascu la r/blood/classification.htm l	2. C2	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE SDL Evaluation

Regulation of blood flow	1.Define and describe Resistance to Blood flow Describe regulation of Blood pressure and Poiseuilles law • Describe factors related with Blood viscosity and its role in regulation	 Ganong's Review of Medical Physiology.25TH Edition.Section 05,Cardiovascular Physiology (Chapter 31, Page 575) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 02(Chapter 5,Page 107)(Chapter 6,page 110) Textbook of Medical Physiology by Guyton & Hall.14th EditionSection 04. (Chapter 14, Page 173) (Chapter 17, Page 205) 	1. https://youtu.be/coc B- M3h9k0 2. https://journals.physiology.corg/doi/full/10.1152/advan.00074.2010 1. https://www.be/GFFlabW	1.C1 2.C1 3.C1	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE SDL Evaluation
Introduction to ECG & its clinical importance	 Enumerate and describe normal components of ECG Draw normal ECG Describe the method of recording ECG Describe the following. Bipolar limb leads. Describe Einthovians law and Enthovian triangle. Describe Chest leads and Augmented unipolar limb leads Describe how to read normal ECG Describe the principles of vectorial analysis of ECG. Describe the vectorial 	 Ganong's Review of Medical Physiology.25TH Edition.Section 01,Immunity,Infection and Inflamma tion(Chapter 29, Page 522) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 14,Page 491) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Chapter 09,Page 170) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 03. (Chapter 11, Page 135) 	 https://youtu.be/SEFhbK 8Z Cgk https://my.clevelandclinic .o rg/health/diagnostics/169 53 electrocardiogram-ekg 	C1 C1 C1 C1 C1 C1 C1 C1	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE SDL Evaluation
	analysis of normal ECG					

Vectorial analysis & arrhythmias	 Describe the principles of vectorial analysis of ECG. Describe the vectorial analysis of normal ECG Define arrhythmia Describe abnormal sinus rhythms 	 Ganong's Review of Medical Physiology.25TH Edition.Section 05(Chapter 29, Page 526) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.(Chapter 09,Page 179,180- 189) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 03. (Chapter 12, Page 143)((Chapter 13, Page 157) 	1. https://www.brainkart.co m/ article/Principles-of- Vectorial-Analysis-of- Electrocardiograms 1924 1/ 3. https://youtu.be/6Lrptve KY us 2. https://www.medicalnewst oday.com/articles/8887#d ef inition	C1 C1 C1 C1	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE SDL Evaluation
Ca c cycle	 Describe the cardiac cycle in detail Enumerate and explain its events Explain the events of cardiac cycle 	 Ganong's Review of Medical Physiology.25TH Edition.Section 05,(Chapter 30, Page 537) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 14,Page 495-500) Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 154) Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 03. (Chapter 9, Page 117) 	1. https://youtu.be/XbivIaF Po QI 2. https://www.sciencedirec t.c om/science/article/pii/S0 01 0027721003309 3. https://youtu.be/sLLLOa Z8 5Lk 4. https://teachmephysiolog y. com/cardiovascular- system/cardiac-cycle- 2/cardiac-cycle/ 5. https://youtu.be/HNkwX ZS SssU	C1 C1/C2 C2	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE SDL Evaluation

Splanchnic circulation, cutaneous circulation	 Describe the Physiologic anatomy of cerebral blood flow Describe the blood flow in normal state and local control of blood flow 	 Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 173) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 7,page 146) 	1. https://youtu.be/hr6oGu W7 mVA 2. https://www.sciencedirec t.c om/topics/medicine- and- dentistry/splanchnic-blood- flow 3. https://www.ncbi.nlm.nih .g ov/pmc/articles/PMC299 92 90/	1.C2 2. C2	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE SDL Evaluation
Regulation of blood pressure	 Explain short term regulation of blood pressure Explain central nervous system ischemic response & cushing reaction 	 Ganong's Review of Medical Physiology.25TH Edition.Section 05(Chapter 32, Page 585,590) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 15,Page 517,528) Physiology by Linda S. Costanzo 6th Edition.Cardiovascular Physiology (Chapter 4,Page 163) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.(Chapter 18,Page 217) 	1. https://youtu.be/HUf1Ltk Pj 1k 2. https://www.sciencedirec t.c om/topics/nursing- and- health- professions/blood- pressure-regulation 3. https://www.cliffsnotes. co m/study- guides/anatomy- and- physiology/the- cardiovascular- system/control-of- blood- pressure	1.C2 2. C2	MCQ SEQ VIVA VOCE MCQ (LMS based Aseessment, MST based Assessment) OSPE SDL Evaluation

	Practicals			
Topic	Learning Objectives At The End Of Practical Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
	• Define B. P	C1		
Blood Pressure atrest	Detail study of apparatus	P		OSPE
and during exercise	How to use apparatus	P	Skill Lab	Viva
	 Indentify changes in blood pressure during exercise 	P		
	• Importance of radial pulse & JVP	C1		
Examination of arterial	• Procedure	P	Skill Lab	OSPE
pulse andJVP	Various characteristic of pulse	P, C2		Viva
	Detail study of ECG leads	C2		
	How to apply leads	P		OSPE
ECG	• Recording	P	Skill Lab	Viva
	Discussion about normal ECG	P, C2		
	Clinical importance	C2		
	• Inspection	P		
Clinical examinationof	• Palpation	P	Skill Lab	OSPE
chest (Heart sounds)	Auscultation of all areas of heart	P		Viva
	Locate apex beat	P		
	• Steps of CPR	P		OSPE
CPR	Importance of CPR in daily life	C2, P	Skill Lab	Viva
	Steps of Examination	P		OSPE
Triple Response	Clinical Importance	C2	Skill Lab	Viva

	Biochemistry			
	Theory			
Topic	Learning Objectives	Learning	Teaching Strategy	Assessment Too
	At the end of lecture students should be able to	Domain		
	Define lipids	C1		MCQs SAQs
Definition and Biological	Classify lipids	C2	LGIS	Viva
importance of lipids.	Describe Biomedical significance of lipids	C2		
	Classify fatty acids	C1		MCQsSAQs
Fatty acids	Describe physical and chemical properties of fatty acids	C2	LGIS	Viva
	Elaborate Structure and physical properties of Triglycerides	C2		MCQsSAQs
Simple lipids	Discuss Chemical properties of Triglycerides and their clinical significance	C2	LGIS	Viva
Compound lipids	Classify compound lipids	C2		MCQsSAQs
(Phospholipids, glycolipids, lipoproteins)	Discuss structure and functions of compound lipids	C2	LGIS	Viva
gryconpids, npoproteins)	Interpret the clinical role of compound lipids	С3		
	Describe derived lipids	C2		MCQsSAQs
Derived lipids			LGIS	Viva
	Describe Structure and physical properties of Cholesterol	C2		MCQsSAQs
Cholesterol	Discuss Chemical properties and functions	C2	LGIS	Viva
	Interpret clinical findings of hypercholesterolemia	C3		
	Classify Prostaglandins	C2		MCQsSAQs
Prostaglandins	Describe functions and clinical significance of Prostaglandins.	C2	LGIS	Viva
	• Interpret the role of drugs in prostaglandin synthesis	C3		
	Carbohydrate Chemistry			1

Introduction and classification of carbohydrates	 Classify carbohydrates Explain different types of carbohydrates and their clinical significance 	C2 C2	LGIS	MCQsSAQs Viva
Isomerism, optical activity and mutarotation	Discuss Different properties of carbohydrates (Isomerism, optical activityand mutarotation)	C2	LGIS	MCQsSAQs Viva
Monosaccharide	 Classify monosaccharide Describe chemical properties of monosaccharide Interpret the clinical role of sorbitol, mannitol and cardiac glycosides 	C2 C2 C3	LGIS	MCQsSAQs Viva
Disaccharides	Describe Structure and functions of Individual sugars	C2	LGIS	MCQs SAQs Viva
Homopolysaccharides	Explain Structure, physical and chemical properties of homopolysaccharide and their biological importance.	C2	LGIS	MCQs SAQs Viva
Heteropolysaccharides	 Explain Structure, physical and chemical properties of heteropolysaccharides and their biological importance. Apply the role of heteropolysaccharides in clinical cases 	C2 C3	LGIS	MCQs SAQs Viva

Topic	Learning Objectives	Learning	Teaching Strategy	Assessment Tool
	At the end of lecture students should be able to	Domain		
Introduction of lipidsand	Classify lipids and carbohydrates	C1		MCQs,SAQs
carbohydrates	Discuss importance of lipids and carbohydrates	C2	SGD	Viva
	Classify fatty acids	C1		MCQsSAQs
Fatty acids	Describe physical and chemical properties of fatty acids	C2	SGD	Viva
	Describe Structure and physical properties of Cholesterol	C2	SGD	MCQsSAQs
Cholesterol	Discuss Chemical properties and functions	C2		Viva
	Interpret clinical findings of hypercholesterolemia	C3		

Heteropolysaccharides	 Explain Structure, physical and chemical properties of heteropolysaccharides and their biological importance. Apply the role of heteropolysaccharides in clinicalcases 	C2C3	SGD	MCQsSAQs Viva	
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Topic	Learning Objectives At the end of lecture students should be able to	References
	Protein chemistry	•
Classifications and functions of carbohydrates	 Classify carbohydrates Explain different types of carbohydrates and their clinical significance 	 Textbook of Lippincott 8th Edition Chapter No.7 pg 92,93 Text Book of Harper 32 S T Edition chap No. 15 pg 141, 142,144,147
Classifications and functions of lipids	Define lipidsClassify lipidsDescribe Biomedical significance of lipids	 Textbook of Harper 32 S T Edition Chapter No.21 pg 196
Fatty acids and simplelipids	 Classify fatty acids Describe physical and chemical properties of fatty acids Elaborate Structure and physical properties of Triglycerides Discuss Chemical properties of Triglycerides and their clinical significance 	Textbook of Lippincott 8 th Eidtion Chapter No.15 pg 196 -199
Classification and Chemical reactions of monosaccharide	 Classify monosaccharide Describe chemical properties of monosaccharide Interpret the clinical role of sorbitol, mannitol and cardiac glycosides 	Text Book of Harper 32 S T Edition chap No.15 pg 142, 145
Disaccharides	Describe Structure and functions of Individual sugars	• Text book of Harper 32 S T Edition Chap No.15 pg 145, 156
Compound lipids	 Classify compound lipids Discuss structure and functions of compound lipids Interpret the clinical role of compound lipids 	Textbook of Lippincott 8 th Eidtion Chapter No. 21 pg 199-202
Prostaglandins	 Classify Prostaglandins Describe functions and clinical significance of Prostaglandins. Interpret the role of drugs in prostaglandin synthesis 	 Textbook of Lippincott 8th Eidtion Chapter No. 17 pg 236 Text Book of Lehninger 7th Edition chap No. 10.3 pg 375,376

Heteropolysaccharides	 Explain Structure, physical and chemical properties of heteropolysaccharides and their biological importance. Apply the role of heteropolysaccharides in clinical cases 	 Textbook of Lippincott 8th Eidtion Chapter No. 14 pg 173-175 Text Book of Harper 32 S T Edition Chap No.15 pg 147,148
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Practicals				
Topic	Learning Objectives At The End Of Practical Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Carbohydrates	Perform Tests for the detection of carbohydrates and reducing sugars (Molisch's test)	P	Skill lab	OSPE
Carbohydrates	Perform Tests for the detection of carbohydrates and reducing sugars (Benedict's tests)	P	Skill lab	OSPE
Carbohydrates	Perform Tests for differentiation between Mono and disaccharides; Aldo and ketosugars (Barford's and Salvinoff's test)	P	Skill lab	OSPE
Carbohydrates	Perform Iodine test	P	Skill lab	OSPE

Basic and Clinical Sciences (Vertical Integration)

Anatomy, Physiology & Biochemistry Theory				
Anatomy	Cardiac Temponade	Apply basic knowledge of subject to study clinical case.	C3	
	Coarctation of Aorta	Apply basic knowledge of subject to study clinical case.	C3	
Physiology	Pitting edema	Apply basic knowledge of subject to study clinical case	C3	
	Palpitations / Tachycardia	Apply basic knowledge of subject to study clinical case	C3	
Biochemistry	Atherosclerosis	Apply basic knowledge of subject to study clinical case.	C3	
	Heparin/dextran	Apply basic knowledge of subject to study clinical case.	C3	

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

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

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

	Pathology Theory							
Т	Горіс	Learning Objectives At the end of lecture students should be able to	Learning Domain	Teaching Strategy	Assessment Tool			
		Define edema	C1					
Ed	dema	Classify edema	C2	LGIS	MCQ			
		• Discuss pathophysiology of edema with clinical correlation	C2					

	Medicine							
Theory								
Topic	At the End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool				
	Define Hypertension	C1						
	Discuss various causes and grades.	C2	LGIS	MCQs				
Hypertension	Explain the clinical presentation.	C2						
Trypercension	Compare between primary and secondary hypertension.		Lois	1.10 (5				
	Enlist the lab investigations to be done for hypertension.	C2						
	Discuss the treatment plan of hypertension.	C2	-					
	Discuss ACS and its various causes.	C2						
Overview of acute	Illustrate the clinical presentation of ACS.	C2						
coronary syndrome	Explain the workshop to be done in E.R for ACS	C2	LGIS	MCQs				
	Discuss the treatment of ACS	C2						
Management of heart failure	Discuss the stepwise management of heart failure.	C2	LGIS	MCQs				
Management of	Discuss the management according to various types of shock.	C2	LGIS					
shock				MCQs				

Obstetrics & Gynecology										
	Theory									
Topic	At The End Of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool						
	Understand physiological changes in cardiovascular system during pregnancy (incl. plasma volume, stroke volume, cardiac output, blood pressure)	C2								
Cardiovascular changes in	Know physiological versus pathological symptoms related to CVS	C2		MCQs						
pregnancy, common cardiac	Briefly describe clinical presentations of common cardiac diseases during pregnancy (rheumatic heart disease, cardiomyopathy, cardiac failure)	C2	LGIS							
diseases	The effect of cardiac disease on fetus and the mother	C2								
	Define gestational hypertension	C 1								
Hypertensive disorders in	Describe the spectrum of hypertensive disordersduring pregnancy with proper definitions	C2	LGIS	MCQs						
	Comprehend pathophysiology of these disorders	C2								
	Know clinical presentation of hypertensive disorders	C2								
	Justify relevant laboratory investigations	C2								
	Understand principles of management	C2								
	Enlist maternal and fetal complications	C2								

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

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

Spiral Courses

Content

- Longitudinal Themes
 - $\circ \quad \textbf{The Holy Quran Translation}$
 - o Family Medicine
 - o Behavioral Sciences & Biomedical Ethics
 - o Early Clinical Exposure (ECE)

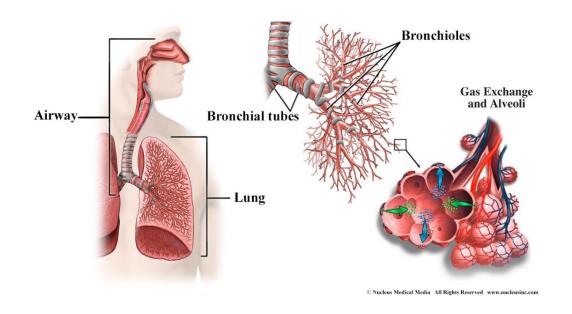
	Behavioral Sciences & Biomedical Ethics							
Theory								
	Topic	At the End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool			
	Sociology & Health	The student should be able to understand sociology & health, social groups, social classes & child rearing practice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

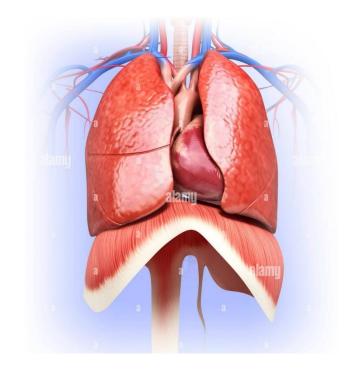
Family Medicine Theory								
	Topic	At the End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool			
		Describe chest pain	C1					
	Approach to a patient with chest pain	Discuss various causes	C2					
		Explain the clinical presentation.	C2	LGIS	MCQs			
		Enlist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

Block-III

Module No. 6 - Respiratory System

Duration 4 Weeks





Respiratory Module Team

Module Name : Respiratory Module

Duration of module : 04 Weeks Coordinator : Dr. Rahat

13. Focal Person Quran Translation

14. Focal Person Family Medicine

Lectures

Co-coordinator : Dr. Qurat ul Ain Reviewed by : Module Committee

Dr. Uzma Zafar

Dr. Sadia Khan

	Module Comr	nittee	Module Task Force Team			
1.	Vice Chancellor RMU	Prof. Dr. Muhammad Umar	1.	Coordinator	Dr. Rahat (Senior Demonstrator of Physiology)	
2.	Chairperson Anatomy & Dean	Prof. Dr. Ayesha Yousaf	2.	DME Focal Person	Dr. Farzana Fatima	
	Basic Sciences					
3.	Director DME	Prof. Dr. Ifra Saeed	3.	Co-coordinator	Dr. Qurat ul Ain (Senior Demonstrator of Anatomy)	
4.	Chairperson Physiology	Prof. Dr. Samia Sarwar	4.	Co-Coordinator	Dr. Almas Ejaz (Demonstrator Biochemistry)	
5.	Chairperson Biochemistry	Dr. Aneela Jamil	5.	Co-coordinator	Dr. Fareed Ullah Khan (Senior Demonstrator Physiology)	
6.	Focal Person Anatomy First Year	Asso. Prof. Dr. Mohtashim Hina				
	MBBS					
7.	Focal Person Physiology	Dr. Sidra Hamid		DM	IE Implementation Team	
			1.	Director DME	Prof. Dr. Ifra Saeed	
8.	Focal Person Biochemistry	Dr. Aneela Jamil	2.	Assistant Director DME	Dr. Farzana Fatima	
9.	Focal Person Pharmacology	Dr. Zunera Hakim	3.	Implementation Incharge 1st & 2 nd	Prof. Dr. Ifra Saeed	
				Year MBBS	Dr. Farzana Fatima	
					Dr. Saira Aijaz	
10.	Focal Person Pathology	Dr. Asiya Niazi	4.	Editor	Muhammad Arslan Aslam	
11.	Focal Person Behavioral Sciences	Dr. Saadia Yasir				
12.	Focal Person Community Medicine	Dr. Afifa Kulsoom				

			Them	es						
Block	Module	General Anatomy	Embryology	Histology	Gross Anatomy					
	• Anatomy		 Embryology of Respiratory System 	Histology of Upper & Lower Respiratory System	Gross Anatomy of Upper & Lower Respiratory System					
	Biochemistry	• pH, Electron acid base reg	1 1 1	vlation, Water soluble vitamins ribofla	avin, biotin, pyridoxine, pantothenic acid, Normal					
	• Physiology	Pulmonary C Respiratory NRegulation of Useful Metho	 Pulmonary Ventilation, Pulmonary Volumes and Capacities, Alveolar Ventilation, Functions of the Respiratory Passageways Pulmonary Circulation, Pulmonary Edema, Physical Principles of Gas Exchange; Diffusion of Oxygen and Carbon Dioxide Through the Respiratory Membrane Transport of Oxygen and Carbon Dioxide in Blood and Tissue Fluids Regulation of Respiration Useful Methods for Studying Respiratory Abnormalities, Respiratory Insufficiency, Hypoxia & Oxygen Therapy, Hypercapnia & Artificial Respiration Respiratory changes during Exercise, Aviation, Space & Deep-Sea Diving Physiology 							
	Spiral Courses									
III	 The Holy Quran Translation 	 Immaniat- V & VI Ibaadat-V 								
	Artificial Intelligence	Artificial Intelligence basic concepts								
	Family Medicine	Approach to a patient with cough hemoptysis & shortness of breath								
	Climate Change & Health	 Effects of Climate Changes on Body Systems (IHD, Skin Diseases & Heat Stroke) Effects of Climate Changes on Respiratory System (Asthma, COPD, Allergies & Cancers) Greenhouse effect 								
	• Bioethics Professionalism & Behavioral Sciences	 Global warming and climate change Crises intervention and disaster Conflict resolution and empathy 								
		•	Vertica	al Integration						
	Medicine	Tuberculosis								
	 Pathology 	Clinical disorders of Respiration								
	• ENT	Foreign body nose & ear &Tonsillitis								
	Early Clinical Exposure (ECE)									
	 Medicine 	Dyspnea Observe/see patients								
		 Cyanosis 	& see Asthma case COPD cases							

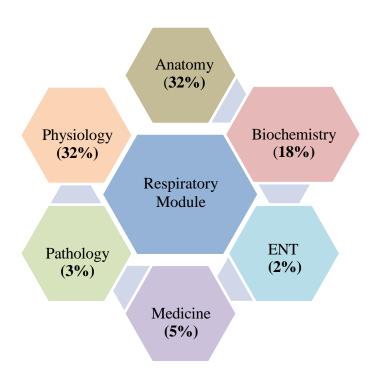
	Tuberculosis cases with fibrosis of lungs				
 Surgery 	See cases of Flail chest & Pneumothorax				
	Chest intubation				
 Radiology 	Radiology of chest				
	Chest X-ray at different level with reference to Anatomy and Pathologies				
	Clinical Relevance				
Obstructive Lung	Diseases				

- Pneumonia
- Pathophysiology and Management of Asthma Mechanisms and Clinical Presentation of COPD
- Diagnosis and Initial Management of Pulmonary Embolism
- Respiratory Distress Syndrome in Newborns
- Pneumonia: Causes, Symptoms, and Treatment
- Hypoxemia: Mechanisms and Clinical Manifestations
- Clinical Presentation of Tuberculosis (TB) and Its Management
- Acid-Base Disorders in Respiratory Failure (e.g., respiratory acidosis)
- Clinical Features of Pleural Effusion and Its Diagnosis
- Chronic Bronchitis: Pathology and Treatment

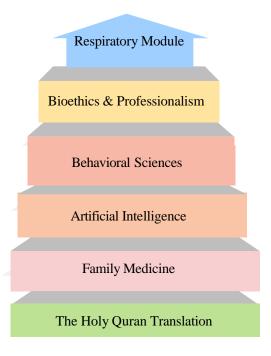
Implementation of Terms of Reference (TORS)

- Total hours of teaching, learning and formative/summative internal assessment to be completed in a year are predefined as per the guidelines of PMDC and to be strictly followed.
- The hours mentioned within each module are the mandatory minimum required.
- The content and the intended learning outcomes written are mandatory, to be taught, at the level required, as the end year assessment will be based on these. However, the level of cognition can be kept at a higher level.
- The Table of Specifications provided will be used for the three papers of the first professional examination.
- The same table of specifications should be used for the respective block exams for internal assessment.
- The criteria defined for continuous internal assessment is to be followed for each module and block respectively

Integration of Disciplines in Respiratory Module



Spiral / General Education Cluster Courses (8%)



Module No. 6 - Respiratory

Rationale: A respiratory system's function is to allow gas exchange. The space between the alveoli and the capillaries, the anatomy or structure of the exchange system, and the precise physiological uses of the exchanged gases vary depending on the organism. In humans' respiratory system include airways, lungs, and the respiratory muscles. Molecules of oxygen and carbon dioxide that are passively exchanged, by diffusion, between the gaseous external environment and the blood. This exchange process occurs in the alveolar region of the lungs.

In this present module has been designed to unfold structural organization function congenital anomalies and diseases of respiration. It explains the anatomy, control, gases exchange, reflexes of respiratory system. It also helps to include the radiological examination of the respiratory system.

Module Outcomes

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

Knowledge:

- 1. Integrate the basic science knowledge with clinical sciences in order to describe the pathogenesis, clinical presentations of common respiratory disorders, e.g. COPD
- 2. Use technology based medical education including
 - Artificial Intelligence.
- 3. Appreciate concepts & importance of Family Medicine

Biomedical Ethics

Research.

Skill:

- 1. Describe the gross anatomy of mediastinum along with clear understanding of structures present in it.
- 2. Correlate between histological structure of respiratory membrane and its role in diffusion of gases.

Attitude:

1. Demonstrate a professional attitude, team building spirit and good communication skills.



Syllabus of Respiratory System (Module No. 6)

	Anatomy			
	Theory			
Topic	Learning Objectives	Learning	Teaching	Assessment Tool
	At the end of lecture students should be able to	Domain	Strategy	
	Explain division of the respiratory system	C2		
Respiratory	Describe different functions of respiratory system.	C2		
system 1	Describe details of respiratory epithelium	C2		MCQ
(Histology)	Discuss microscopic structure of vestibule	C2	LGIS	SAQ
	Describe structural specialization in mucosa of nasal cavity proper	C2		VIVA
	Appreciate differences between respiratory mucosa and olfactory mucosa	C1		
	Describe the features of olfactory mucosa	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		
	Describe microscopic structure of paranasal sinuses	C2		
Respiratory	Describe general histological organization of respiratory system	C2		
system II	Appreciate different histological layers of nasopharynx	C1	LGIS	MCQ SAQ
(Histology)	Describe histological structure of laryngeal cartilages	C2	LOIS	VIVA
	Discuss components of tracheal wall	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		
Respiratory	Describe division of bronchial tree	C2		
System III (Histology)	Discuss microscopic structure of extra and intra pulmonary bronchi	C2		
(Thstology)	Describe histological structure of bronchioles	C2	LGIS	MCQ SAQ
	• Appreciate differences between bronchi and bronchioles Discuss microscopic structure of terminal bronchioles	C1		VIVA
	Appreciate the significance of Clara cells with their functions	C2		
	• Discuss other cells present in terminal bronchioles	C2		
	Describe the microscopic structure of respiratory bronchioles	C2		
	• Describe differences between respiratory and terminal bronchioles Describe characteristics of alveolar ducts	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		
	Describe histological structure of alveolar ducts and their functions	C2		
	• Identify type 1 and type II alveolar cells	C1		1,000 0 1 0 1 1 1 1 1
Respiratory	Describe histological structure of interalveolar septum	C2	LGIS	MCQ SAQ VIVA
System IV (Histology)	Discuss role of alveolar macrophages	C2		
(Thistology)	Describe Blood – Air barrier in detail	C2		
	Discuss histology of pleura in detail	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		
	Describe role of pharyngeal arches in development of nose	C2	LGIS	MCQ SAQ VIVA
Development of Nose and Paranasal sinuses	Describe development of nose and paranasal sinuses	C2		
	Describe the Congenital anomalies of nose and paranasal sinuses	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		
	Describe formation of respiratory primordium	C2		
Development of Larynx &	Describe the role of pharyngeal arches in development of larynx	C2		MCQ SAQ VIVA
Trachea	Discuss formation of laryngotracheal diverticulum	C2	LGIS	
	Describe formation of trachea esophageal septum and its importance	C2		
	Describe Congenital defects associated with development of Trachea	C3		
	Describe formation and division of respiratory buds	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		
	Discuss development of bronchi and bronchopulmonary segments	C2	LGIS	MCQ SAQ VIVA
Development	Describe development of pleural cavities	C2		
of Lungs	Discuss process of maturation of lungs	C2		
	• Enlist different stages of lung maturation	C1		
	• Explain the production and significance of Surfactant	C2		

	Describe role of fetal breathing movements in maturation of lungs	C2		
	Discuss postnatal development of lungs	C2		
	Describe congenital anomalies associated with lungs	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		
	Describe the development of diaphragm	C2		
Development of Diaphragm	Elaborate formation of septum transversum and its role in development of diaphragm	C2	LGIS	MCQ SAQ VIVA
of Diaphragin	Discuss congenital defects associated with diaphragm	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		

	Topic	Learning Objectives At the end of lecture students should be able to	Learning Domain	Teaching Strategy	Assessment Tool
		Describe anatomy of nasal cavity	C2	Skill Lab	MCQ SAQ Viva OSPE
Nose & Paranasal		Describe the blood supply and the site of anastomosis in the nose.	C2		
		Discuss the nerve supply of nose	C2		
		Discuss the applied and the related clinical.	C3		
		Define and enumerate para nasal sinuses.	C1		
	Sinuses	Discuss the shape, location and their point of openings.	C2		
		Correlate the clinical conditions	C3		
		Understand the preventive and curative health care measures	C3		

	Practice the principles of Bio	ethics	C3		
	Apply strategic use of AI in I	nealth care	C3		
	Read a research article		C3		
	Enumerate the components or	flarynx	C1		
	 Describe paired and unpaired 	cartilages of larynx Describe Intrinsic and	C2		
		origin, insertion nerve supply and action).			
	Describe Intrinsic and extrins	ic membrane (attachments and structure	C2		MCQ SAQ
Laryn	prereing the memeranes).			- 01 '11 T 1	Viva OSPE
Tracl	Discuss the inovenients of vol	ocal cords and their effects on the voice and respiration.	C2	Skill Lab	
	 Discuss the blood supply and 	nerve supply of larynx.	C2		
	 Discuss the applied and the re- 	elated clinical.	C3		
	 Describe the level of comment tracheal cartilages. 	ncement of trachea, its termination and the	C2		
	State the level of division of	trachea	C1		
	• Describe in detail the nerve s	upply and blood supply of trachea.	C2		
	Correlate the clinical condition	ons	C3		
	Understand the preventive an	d curative health care measures	C3		
	Practice the principles of Bio		C3		
	Apply strategic use of AI in I	nealth care	C3		
	Read a research article		C3		
	Enumerate the bones of the bones of the the bones of the bone	norax.	C1		
	 Describe and classify the typerelations, types and ossification 	ical ribs (side determination, features, attachments, on.	C2		
	• Correlate the clinical condition		C3		MCQ SAQ
	eW 0I • Understand the preventive an		C3		Viva OSPE
Thora	• Practice the principles of Bio		C3	Skill Lab	
	Apply strategic use of AI in I		C3		
	Read a research article		C3		
		pical ribs (side determination, features, attachments,	C2		
Skel	on of relations, types and ossificati				
thora	• Differentiate between typical		C2		
(H	Discuss costal cartilages and	• •	C2		MCQ SAQ
	Correlate the clinical condition		C3		Viva OSPE
	Understand the preventive an	d curative health care measures	C3	1	

	Practice the principles of Bioethics	C3	Skill Lab	
	Apply strategic use of AI in health care	C3		
	Read a research article	C3		
	Identify different parts of sternum.	C1		
	Describe the bony features, attachments ossification of sternum	C2		
Skeleton of	Correlate the clinical conditions	C3		MCQ SAQ
thoracic wall	Understand the preventive and curative health care measures	C3	Skill Lab	Viva OSPE
(Sternum)	Practice the principles of Bioethics	C3		
	Apply strategic use of AI in health care	C3		
	Read a research article	C3		
	• Classify the joints of the thorax.	C2		
Joints of thoracic	Discuss the type, ligaments and relations of the joints of the thorax (Manubriosternal, xiphisternal, costoverterbal, costotransverse, costochondral, chondrosternal,	C2	Skill Lab	MCQ SAQ Viva OSPE
wall	• interchondral and intervertebral joints).		_	
wan	Discuss the components functions of the intervertebral disc.	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		
	• Discuss the boundaries, shape and structure passing through superior thoracic aperture (viscera, blood vessels, nerve and muscles)	C2		
	Describe the thoracic inlet syndrome.	C3		MCQ SAQ
Thoracic	• Discuss the boundaries, shape and structures passing through the inferior thoracic aperture.	C2	Skill Lab	Viva OSPE
apertures	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		
	• Discuss the thoracic wall.	C2		
Intercostal spaces /	• Describe the intercostals muscles (origin, insertion, direction of fibers, nerve supply and actions.	C2		MCQ SAQ

	Discuss in detail the formation, branches, distribution and the related clinical of the	C3	Skill Lab	Viva OSPE
Movements of	intercostals nerves.	CO		
Movements of thoracic wall	• Explain the formation, course, relations, distribution and branches of the thoracic	C2		
thoracic wan	sympathetic trunk.Differentiate between the typical and atypical intercostals space.	C1	_	
		C2	\dashv	
	Compare the typical and atypical intercostals space.		_	
	• Describe the types and axis of movements of vertebral column (flexion, extension,	C2		
	lateral flexion and rotation).	C1	_	
	• Define the respiratory movements on the basis of principles, factors and the	C1		
	different types (pump handle, bucket handle and piston).	G2	_	
	• Discuss the related physiological and pathological changes occurring (related to age movement etc).	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		
	• Describe the small and large openings in the diaphragm (vertebral level, location,	C2	Skill Lab	MCQ SAQ
	formation, structures passing through and effects on the openings and structures by			Viva OSPE
	the diaphragmatic contraction).			
	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		
	• Explain the arterial supply of intercostals space (anterior / posterior, parent vessels,	C2		
	branches, course, relations and termination).			
	Differentiate between the arterial supply of typical and atypical intercostal space	C3		
Vessels and	with the related clinicals.		Skill Lab	1.000
	• Explain the venous drainage of the intercostal spaces (anterior / posterior, parent	C2	SKIII Lau	MCQ SAQ
lymphatics of	vessels, tributaries, course, relations and termination).			Viva OSPE
thoracic wall	Differentiate between the venous drainage of typical and atypical intercostal space	C3		
	with the related clinicals			
	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		
	Discuss the origin of intercostal nerves.	C2		
	Discuss course of nerves.	C2		
Innervation of	Discuss branches and related area supplied by these	C2		MCQ SAQ
Thoracic Wall	Correlate the clinical conditions	C3	Skill Lab	Viva OSPE
	Understand the preventive and curative health care measures	C3	SKIII Lau	
	Practice the principles of Bioethics	C3	=	
	Apply strategic use of AI in health care	C3]	
	Read a research article	C3]	
	Discuss visceral and parietal pleura	C2		
	Discuss the pleural recesses and pleural cavity.	C2]	
Pleura	Describe the nerve and blood supply of pleura.	C2	=	MCQ SAQ Viva OSPE
	Correlate the clinical conditions	C3	- Skill Lab	
	Understand the preventive and curative health care measures	C3	SKIII Lau	
	Practice the principles of Bioethics	C3	=	
	Apply strategic use of AI in health care	C3		
	Read a research article	C3]	
	Identify the features of right and left lung.	C1		
	Discuss the bronchopulmonary segments and their clinical significance	C3		
	Discuss and differentiate between the root of lung and the hilum of lung.	C2	=	MCQ SAQ
Lungs	Describe the nerve plexuses related to the lungs.	C2	Skill Lab	Viva OSPE
Lungs	Explain the blood supply of lungs	C2	SKIII Lau	
	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		
Surface Marking	Identify heart borders	P1	Skill Lab	MCQ SAQ
	aortic knuckle,	P1		Viva OSPE
	costophrenic angles,	P1		

• cardio phrenic angles,	P1	
• domes of diaphragm,	P1	
• counting of ribs	P1	
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	

Topics Of SDL	Learning Objective	References
Nose, paranasal sinuses, larynx, and trachea	 Describe anatomy of nasal cavity Describe the blood supply and the site of anastomosis in the nose. Discuss the nerve supply of nose Discuss the applied and the related clinical. Define and enumerate para nasal sinuses. Discuss the shape, location and their point of openings. Clinical significance with surgical interventions. Enumerate the components of larynx Describe paired and unpaired cartilages of larynx Describe Intrinsic and extrinsic muscles of larynx (origin, insertion nerve supply and action). Describe Intrinsic and extrinsic membrane (attachments and structure piercing the membranes). Discuss the movements of vocal cords and their effects on the voice and respiration. Discuss the applied and the related clinical. Describe the level of commencement of trachea, its 	Clinical Oriented Anatomy by Keith L. Moore.5TH Edition. (Page 395, 396, 973, 974, 978, 979) https://youtu.be/UPrY8JqXYCc https://youtu.be/IDBYF2i9vqU https://www.ncbi.nlm.nih.gov/books/NBK513272/
	 termination and the tracheal cartilages. State the level of division of trachea 	

	• Describe in detail the nerve supply and blood supply of	
	trachea.	
	 Correlate the clinical aspects 	
	 Read relevant research article 	
	Use digital library	
Skeleton of thoracic wall	• Describe and classify the atypical ribs (side determination, features, attachments, relations, types and ossification.	Clinical Oriented Anatomy by Keith L. Moore.5TH Edition. (Page 299). https://youtu.be/PoA-Uq9w-7s
	Differentiate between typical and atypical ribs.	https://www.ncbi.nlm.nih.gov/books/NBK557710/
	Discuss costal cartilages and their attachments.	inteps.//www.incol.infil.infil.gov/odoks/1vBx357710/
	 Discuss the applied and the related clinicals. 	
	 Identify different parts of sternum. 	-
	Describe the bony features, attachments ossification of	-
	sternum	
	Correlate the clinical aspects	
	Read relevant research article	
	Use digital library	
	Discuss the thoracic wall.	Clinical Oriented Anatomy by Keith L. Moore.5TH Edition. (Page 306,
	 Describe the intercostals muscles (origin, insertion, 	307, 308). https://youtu.be/NwDxbNqEVaA
	direction of fibers, nerve supply and actions.	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4534848/
	Discuss in detail the formation, branches, distribution and	
Movements of thoracic	the related clinical of the intercostals nerves.	
wall and Intercostal	• Explain the formation, course, relations, distribution and	
spaces	branches of the thoracic sympathetic trunk.	
	 Differentiate between the typical and atypical 	
	• intercostals space.	
	• Compare the typical and atypical intercostals space.	
	• Describe the types and axis of movements of vertebral	
	column (flexion, extension, lateral	
	• flexion and rotation).	
	 Define the respiratory movements on the basis of 	
	• principles, factors and the different types (pump handle,	
	bucket handle and piston).	
	• Discuss the related physiological and pathological changes	
	occurring (related to age movement etc).	
	 Correlate the clinical aspects 	

	Read relevant research article	
	Use digital library	
Anatomy of diaphragm	 Describe the small and large openings in the diaphragm (vertebral level, location, formation, structures passing through and effects on the openings and structures by the diaphragmatic contraction). Correlate the clinical aspects Read relevant research article Use digital library 	Clinical Oriented Anatomy by Keith L. Moore.5TH Edition. (Page 297, 313, 314, 391, 396, 397, 412, 455, 457, 521, 523). https://youtu.be/6IK-YHK1ToM https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5184786/
Pleura	 Discuss visceral and parietal pleura Discuss the pleural recesses and pleural cavity. Describe the nerve and blood supply of pleura. Correlate the clinical aspects Read relevant research article Use digital library 	Clinical Oriented Anatomy by Keith L. Moore.5TH Edition. (Page 333, 334, 335, 336). https://youtu.be/66PR3IYWb0Ahttps://www.ncbi.nlm.nih.gov/pmc/articles/PMC4332049/
Lungs	 Identify the features of right and left lung. Discuss the bronchopulmonary segments and their clinical significance Discuss and differentiate between the root of lung and the hilum of lung. Describe the nerve plexuses related to the lungs. Explain the blood supply of lungs Correlate the clinical aspects Read relevant research article Use digital library 	Clinical Oriented Anatomy by Keith L. Moore.5TH Edition. (Page 337-347). https://youtu.be/66PR3IYWb0Ahttps://www.ncbi.nlm.nih.gov/pmc/articles/PMC4332049/

	Practicals			
Topic	Learning Objectives At The End Of Practical Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Olfactory/Nasal	Identify microscopic structure of respiratory and nasal mucosa under microscope.	P1		
mucosa	 Illustrate histological structures of olfactory / nasal mucosa Write two points of identification 	C1 C1	Skills Lab	OSPE
	Identify types of cells and epithelium of epiglottis under microscope	P1		
Epiglottis	 Illustrate histological structure of epiglottis. Write two points of identification	C1 C1	Skills Lab	OSPE
Trachea	 Identify microscopic structure of trachea. Illustrate microscopic structure of trachea. 	P1 C1	Skills Lab	OSPE
	 Write two points of identification Identify microscopic structure of, bronchi, terminal bronchiole, 	C1 P1		
Lungs	respiratory bronchiole, alveoli, alveolar duct of the respiratory tract on the basis of Types of epithelial cells present Relative amount of gland, cartilage, smooth muscles and connective tissue fibers present in wall of the tubes.		Skills Lab	OSPE
	Illustrate microscopic structure of different layers of respiratory passages.	C1		
	Write points of identification of each part	C1		

Physiology								
Theory								
Topics	Learning Objectives	References	Learning Resources	Learning Domains	Learning Strategy	Assessment Tools		
Mechanics of pulmonary ventilation, Lung compliance	 Enumerate muscles of inspiration and expiration and Describe mechanics of pulmonary ventilation Describe surfactant, surface tension and collapse of alveoli Define compliance. Draw compliance diagram of lungs. Explain relationship of surface tension, radius of alveoli, elastic forces of lungs with compliance 	 Ganong's Review of Medical Physiology.25TH Edition. Section 06, Respiratory Physiology (Chapter 34, Page 621,629) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. Mechanics of Breathing (Chapter 17,Page 569) Physiology by Linda S. Costanzo 6th Edition. Respiratory Physiology (Chapter 5,Page 189,197) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 05,(Chapter 36,Page 581), (Chapter 40,Page 629) Textbook of Medical Physiology by Guyton & Hall.14th Edition. (Chapter 38, Page 491,493) 	1.https://www.ncbi nlm.nih.gov/boo k s/NBK538324/ 2.https://youtu.be/ B TwgmMfqOW4	C1 C1 C1 C1 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE		

Pulmonary circulation & Pulmonary capillary dynamics. Physical principles of gas exchange & diffusion through respiratory membrane	 Discuss the role of alveoli and pleural space in respiration and pressure changes during respiration Enlist non-respiratory and respiratory functions of respiration Define and explain the concept of respiratory membrane. Define and draw respiratory unit Draw a diagram showing the exchange of gases through the respiratory membrane Enlist four factors affecting the rate of gas diffusion through the respiratory membrane Define diffusing capacity of respiratory membrane. Describe the diffusing capacity for oxygen. Describe the diffusing capacity for carbon dioxide. Describe the changes in diffusing capacity of oxygen and carbon dioxide during exercise Compare the diffusing capacities of oxygen and carbon dioxide 	 Ganong's Review of Medical Physiology.25TH Edition.Section 06,Respiratory Physiology (Chapter 34, Page 626,633,635) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.Mechanics of Breathing (Chapter 17,Page 574) Physiology by Linda S. Costanzo 6th Edition. Respiratory Physiology (Chapter 5,Page 209) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 05,(Chapter 37,Page 592) Textbook of Medical Physiology by Guyton & Hall.14th Edition. (Chapter 39, Page 503) (Chapter 40, Page 511,515) 	1. https://youtu.be/aJP wUn ZtycQ 2. https://youtu.be/zv 1fDFn 8BaM 3. https://pressbook s-dev.oer.hawaii.edu/biolo gy/chapter/gas-exchange-across-respiratory-surfaces/ 4. https://www.sciencedirect.com/science/article/pii/S2666496822000194.	C2 C1 C1 C1 C1 C1 C1 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
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Pulmonary volumes, capacities & functions of respiratory tract	 Define lung volumes and capacities. Define the four pulmonary volumes and capacities. Enlist normal values of all the lung volumes and capacities Draw a graph representing all the lung volumes and capacities. Describe how lung volumes and capacities can be measured with spirometer. Enlist the lung volumes and capacities which can't be measured by spirometer 	 Ganong's Review of Medical Physiology.25TH Edition.Section 06,Respiratory Physiology (Chapter 34, Page 628) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.Mechanics of Breathing (Chapter 17,Page 578) Physiology by Linda S. Costanzo 6th Edition. Respiratory Physiology (Chapter 5,Page 191) Textbook of Medical Physiology by Guyton & Hall.14th Edition. (Chapter 38, Page 495) 	1. https://yout u.be/9 VdHhD1vc DU 2. https://teach meph ysiology.co m/res piratory- system/venti lation /lung-volumes/	C1 C1 C1 C1 C1	LGIS	M MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
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Transport of oxygen	Describe in detail the transport of oxygen from lungs to tissues	 Ganong's Review of Medical Physiology.25TH Edition.Section 06, Respiratory Physiology (Chapter 35, Page 639) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.Gas Exchange and Transport (Chapter 18, Page 599) Physiology by Linda S. Costanzo 6th Edition. Respiratory Physiology (Chapter 5,Page 210,213,216) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 05,(Chapter 38,Page 603) Textbook of Medical Physiology by Guyton & Hall.14th Edition. (Chapter 	1. https://teachme physi ology.com/resp irator y-system/gas-exchange/oxyg en-transport/ 2. https://youtu.be/HU6 LQldvog	C1	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
		• 41, Page 521)				

• Define And Explain importance. • Draw ventilation perfusion diagram Explain the concept of physiologic shunt and dead space Ventilation perfusion ratio Ventilation perfusion ratio • Ganong's Review of Medical Physiology. 22. (Chapter 34, Page 636) • Human Physiology by Dee Unglaub Silver thorn. 8 TH Edition. Mechanics of Breathing (Chapter 17, Page 587) • Physiology by Linda S. Costanzo 6 th Edition. Respiratory Physiology (Chapter 5, Page 194,225,229) • Physiological Basis of Medical Practice by Best & Taylor's.13 th Edition. Section 05, (Chapter 39, Page 612) • Textbook of Medical Physiology by Guyton & Hall.14 th Edition. (Chapter 38, Page 497)	/UKs OLb5XWa0 2. https://teachme physi ology.com/resp irator y- system/gas- exchange/venti lation -perfusion/	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE,
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	ygen hemoglobin ssociation curve	Describe the role of hemoglobin in oxygen transport. Draw oxy-hemoglobin dissociation curve. Enlist and explain factors which shift the curve towards right and left. • Briefly explain the transport of oxygen in plasma	 Ganong's Review of Medical Physiology.25TH Edition.Section 06, Respiratory Physiology (Chapter 35, Page 639-641) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.Gas Exchange and Transport (Chapter 18, Page 608) Physiology by Linda S. Costanzo 6th Edition. Respiratory Physiology (Chapter 5,Page 218) Textbook of Medical Physiology by Guyton & Hall.14th Edition. (Chapter 41, Page 524) 	1. https://www.sci ence direct.com/topi cs/nur_sing- and-health- professions/oxy gen- dissociation- curve https://youtu.be /MU Kkv1rbOIM	C1 C1 C1 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
Lur	ing function test	Describe all the non-invasive & invasive tests to assess the pulmonary functions	 Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. Mechanics of Breathing (Chapter 17, Page 592) Textbook of Medical Physiology by Guyton & Hall.14th Edition. (Chapter 44, Page 553) 	1. https://www.w ebmd. com/lung/types -of-lung-function-tests 2. https://youtu.be /6dH VhEjzj64	C1	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE

Transport of CO ₂	Enumerate and explain the various transport forms of carbondioxide in blood. Also state percentages of all these forms Explain the carbondioxide dissociation curve Define respiratory exchange ratio. Describe haldanes effect ,bohr effect and chloride shift	 Ganong's Review of Medical Physiology.25TH Edition.Section 06, Respiratory Physiology (Chapter 35, Page 641) Physiology by Linda S. Costanzo 6th Edition. Respiratory Physiology (Chapter 5,Page 223) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 05,(Chapter 38,Page 606) Textbook of Medical Physiology by Guyton & Hall.14th Edition. (Chapter 41, Page 528) 	1. https://courses.lumen learning.com/w m- biology2/chapte r/tra_nsport-of- carbon- dioxide-in-the- blood/ 2. https://youtu.be /Vgp NSdWvrno	C1 C2 C1 C1	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
Respiratory abnormalities (COPD, Tuberculosis, Pneumonia, Atelectasis)	Explain the physiologic peculiarities of chronic pulmonary emphysema, pneumonia, ateiectasis, asthma and tuberculosis	 Ganong's Review of Medical Physiology.25TH Edition.Section 06, Respiratory Physiology (Chapter 36, Page 664) Textbook of Medical Physiology by Guyton & Hall.14th Edition. (Chapter 43, Page 541) 	1. https://www pedia.com/ Respir atory_Disorders 2. <a href="https://youtu.be/S] rKfsCdeqW c <a h"="" href="mailto:3." youtu.be="">3. https://youtu.be/h	C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE

Nervous regulation of respiration Posscribe term respiratory centers. Enumerate th various respiratory centers. Give the anatomical location of respiratory centers.		Op7bs5xdg Q 1. https://yout u.be/	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
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Н	Hypoxia, hypercapnia, cyanosis	 Define hypoxia and hypercapnia. Enumerate and explain its various types. Enumerate the roles of oxygen therapy in different types of hypoxia 	 Ganong's Review of Medical Physiology.25TH Edition.Section 06, Respiratory Physiology (Chapter 35, Page 646,650) Physiology by Linda S. Costanzo 6th Edition.Respiratory Physiology (Chapter 5,Page 239) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 05,,(Chapter 41,Page 653) (Chapter 42,Page 662) Textbook of Medical Physiology by Guyton & Hall.14th Edition. (Chapter 43, Page 546) 	 https://youtu .be/w tn qgs3Fg https://www .very wellhealth.c om/h ypoxia- types- symptoms- and- causes- 2248929 	C1 C1	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
	Chemical regulation of espiration & exercise changes	 Describe in detail the role of respiratory centers in the regulation of respiration. Explain chemical control of respiration in detail Describe changes in respiration during 	 Ganong's Review of Medical Physiology.25TH Edition.Section 06, Respiratory Physiology (Chapter 36, Page 657,664) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 	1. https://youtu.be/g			

Space physiology	exercise. Enumerate and briefly explain factors which affect respiration. • Describe briefly the mechanism of periodic breathing and sleep apnea • Define and explain the process of acclimatization to low oxygen tension • Describe acute and chronic mountain sickness • Describe the effects of acceleratory forces on body in aviation and	 O5,(Chapter 41,Page 649) Textbook of Medical Physiology by Guyton & Hall.14th Edition. (Chapter 42, Page 533,536) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 42,Page 659,663) Textbook of Medical Physiology by Guyton & Hall.14th Edition. (Chapter 44, Page 553) 	1. https://youtu be/N FfHh_rQZJ E 2. https://www.phys_oc.org/caree_rs/res	C1 C1 C1 LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
Miscellaneous factors affecting respiration (concept of voluntary control of respiration, lung J receptor, brain edema, anesthesia, chyne stokes breathing, sleep apnea)	 Describe in detail the role of respiratory centers in the regulation of respiration. Explain chemical control of respiration in detail Describe changes in respiration during exercise. Enumerate and briefly explain factors which affect respiration. Describe briefly the 	 Ganong's Review of Medical Physiology.25TH Edition.Section 06, Respiratory Physiology (Chapter 36, Page 662) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 05,(Chapter 41,Page 656) Textbook of Medical Physiology by Guyton & Hall.14th Edition. (Chapter 42, 	earch/space- physiology/ 1. https://www.ph ysoc. org/careers/res earch/ space- physiology/ 2. https://www.br ainkar t.com/article/F actors- Affecting- Respiration_16 533/	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE

		mechanism of periodic breathing and sleep apnea	Page 538)			
	High altitude physiology	 Describe the effects of low oxygen pressure on body Enumerate the acute effects of hypoxia on body Define and explain the process of acclimatization to low oxygen tension Describe acute and chronic mountain sickness Describe the effects of acceleratory forces on body in aviation and space physiology 	Ganong's Review of Medical Physiology.25 TH Edition.Section 06, Respiratory Physiology (Chapter 35, Page 648) • Physiology by Linda S. Costanzo 6 th Edition.Respiratory Physiology (Chapter 5,Page 237) • Physiological Basis of Medical Practice by Best & Taylor's.13 th Edition.Section 05,(Chapter 42,Page 659) • Textbook of Medical Physiology by Guyton & Hall.14 th Edition. (Chapter • 44, Page 553,556,559)	1. https://youtu https://www.ncbi. nlm.nih.gov/pmc/articles/PMC 2151 873/	C1 C1 LGI	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
Deep	o sea physiology	 Discuss Effect of high partial pressure of individual gasses on the body Discuss Oxygen toxicity at high pressure Carbon dioxide toxicity at high pressure Explain in detail the process of decompression in deep sea divers 	 Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 42, page 665) Textbook of Medical Physiology by Guyton & Hall.14th Edition. (Chapter 44, Page 553) 	 https://medicoapps.org/m-physiology-of-deepsea-diving/ https://youtu.be/eeeNMkPam9aU 	C2 C2 LGI	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE

Topics	Learning Objectives	References	Learning Resources	Learning Domains	Learning Strategy	Assessment Tools
Physiology of unusual environment	 Define and explain the process of acclimatization to low oxygen tension Describe acute and chronic mountain sickness Describe the effects of acceleratory forces on body in aviation and space physiology 	 Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.(Chapter 42,Page 659,663) Textbook of Medical Physiology by Guyton & Hall.14th Edition. (Chapter 44, Page 553) 	https://youtu.be/NF f Hh rQZJE https://www.physoc org/careers/research / space-physiology/	C1 C1 C1	SGD	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
Mechanics of pulmonary ventilation & compliance (Second week)	 Enumerate muscles of inspiration and expiration and Describe mechanics of pulmonary ventilation Describe surfactant, surface tension and collapse of alveoli Define compliance. Draw compliance diagram of lungs. Explain relationship of surface tension, radius of alveoli, elastic forces of lungs with compliance 	 Ganong's Review of Medical Physiology.25TH Edition.Section 06,Respiratory Physiology (Chapter 34, Page 621,629) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.Mechanics of Breathing (Chapter 17,Page 569) Physiology by Linda S. Costanzo 6th Edition. Respiratory Physiology (Chapter 5,Page 189,197) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 05,(Chapter 36,Page 581) ,(Chapter 40,Page 629) Textbook of Medical Physiology by Guyton & Hall.14th Edition. (Chapter 38, Page 491,493) 	https://www.ncbi. n lm.nih.gov/books/ NBK538324/ 3. https://youtu.be/BT wgmMfqOW4	C1 C1 C1 C1 C2	SGD	MCQ SEQ VIVA VOCE MCQ (LMS based Assessme nt, MST based Assessme nt) OSPE

diagram I		https://youtu.be/ U KsOLb5XWa0 https://teachmephysiology.com/respiratory-system/gasexchange/ventilation_n-perfusion/ 1. C1 C1	
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Topics Of SDL	Learning Objective	References	Learning Resources	Learning Domains	Learning Strategy	Assessment Tools
Mechanics of pulmonary ventilation, Lung compliance	 Enumerate muscles of inspiration and Describe mechanics of pulmonary ventilation Describe surfactant, surface tension and collapse of alveoli Define compliance. Draw compliance diagram of lungs. 1. Explain relationship of surface tension, radius of alveoli, elastic forces of lungs with compliance 	 Ganong's Review of Medical Physiology.25TH Edition.Section 06,Respiratory Physiology (Chapter 34, Page 621,629) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.Mechanics of Breathing (Chapter 17,Page 569) Physiology by Linda S. Costanzo 6th Edition. Respiratory Physiology (Chapter 5,Page 189,197) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 05,(Chapter 36,Page 581),(Chapter 40,Page 629) Textbook of Medical Physiology by Guyton & Hall.14th Edition. (Chapter 38, Page 491,493) 	 https://www.ncbi. nlm.nih.gov/books /NBK538324/ https://youtu.be/B TwgmMfqOW4 	C1 C1 C1 C1 C1 C2	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Assessme nt, MST based Assessme nt) OSPE SDL Evaluation
Pulmonary circulation & Pulmonary capillary dynamics. Physical principles of gas exchange & diffusion through respiratory membrane	 Discuss the role of alveoli and pleural space in respiration and pressure changes during respiration Enlist non-respiratory and respiratory functions of respiration Define and explain the concept of respiratory membrane. Define and draw respiratory unit Draw a diagram 	 Ganong's Review of Medical Physiology.25TH Edition.Section 06, Respiratory Physiology (Chapter 34, Page 626,633,635) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.Mechanics of Breathing (Chapter 17, Page 574) Physiology by Linda S. Costanzo 6th Edition. Respiratory Physiology (Chapter 5, Page 209) Physiological Basis of Medical Practice by Best & Taylor's.13th 	1. https://youtu.be/aJPwUnZ tycQ 2. https://youtu.be/zv1fDFn8 BaM 3. https://pressbooks- dev.oer.hawaii.edu/biolog y/chapter/gas-exchange- across-respiratory- surfaces/ https://www.sciencedirect	C2 C1 C1 C1 C1 C1 C1 C1 C1 C1 C2	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Assessme nt, MST

	showing the exchange of gases through the respiratory membrane • Enlist four factors affecting the rate of gas diffusion through the respiratory membrane • Define diffusing capacity of respiratory membrane. • Describe the diffusing capacity for oxygen. • Describe the diffusing capacity for carbon dioxide. • Describe the changes in diffusing capacity of oxygen and carbon dioxide during exercise • Compare the diffusing capacities of oxygen and carbon dioxide	•	Edition.Section 05,(Chapter 37,Page 592) Textbook of Medical Physiology by Guyton & Hall.14 th Edition. (Chapter 39, Page 503) (Chapter 40, Page 511,515)	4com/science/article/pii/ S2 666496822000194			based Assessme nt) OSPE SDL Evaluatio n
Pulmonary volumes, capacities & functions of respiratory tract	 Define lung volumes and capacities. Define the four pulmonary volumes and capacities. Enlist normal values of all the lung volumes and capacities Draw a graph representing all the lung 	•	Ganong's Review of Medical Physiology.25 TH Edition.Section 06,Respiratory Physiology (Chapter 34, Page 628) Human Physiology by Dee Unglaub Silver thorn. 8 TH Edition.Mechanics of Breathing (Chapter 17,Page 578) Physiology by Linda S. Costanzo 6 th Edition. Respiratory Physiology (Chapter 5,Page 191) Textbook of Medical Physiology by	https://yout u.be/9VdH hD1vcDU https://teac hmephysio logy.com/r espiratory- system/ven tilation/lun g- volumes/	C1 C1 C1 C1 C1	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Assessme nt, MST based Assessme nt) OSPE SDL Evaluation

	volumes and capacities. • Describe how lung volumes and capacities can be measured with spirometer. • Enlist the lung volumes and capacities which can't be measured by spirometer	Guyton & Hall.14 th Edition. (Chapter 38, Page 495)			
Transport of oxygen	Describe in detail the transport of oxygen from lungs to tissues	 Ganong's Review of Medical Physiology.25TH Edition.Section 06, Respiratory Physiology (Chapter 35, Page 639) Human Physiology by Dee Unglaub Silver thorn. 8TH Edition.Gas Exchange and Transport (Chapter 18, Page 599) Physiology by Linda S. Costanzo 6th Edition. Respiratory Physiology (Chapter 5,Page 210,213,216) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 05,(Chapter 38,Page 603) Textbook of Medical Physiology by Guyton & Hall.14th Edition. (Chapter 41, Page 521) 	1. https://teachmephysiology.com/respir https://system/gas-exchange/oxygen-transport/ 2. https://youtu.be/H U6 LQldvog	C1 SDL	MCQ SEQ VIVA VOCE

Chemical regulation of respiration & exercise changes	 Describe in detail the role of respiratory centers in the regulation of respiration. Explain chemical control of respiration in detail Describe changes in respiration during exercise. Enumerate and briefly explain factors which affect respiration. Describe briefly the mechanism of periodic breathing and sleep apnea 	 Ganong's Review of Medical Physiology.25TH Edition.Section 06, Respiratory Physiology (Chapter 36, Page 657,664) Physiology by Linda S. Costanzo 6th Edition.Respiratory Physiology (Chapter 5,Page 233,235) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 05,(Chapter 41,Page 649) Textbook of Medical Physiology by Guyton & Hall.14th Edition. (Chapter 42, Page 533,536) 	1. https://youtu.be/g R RLgo9Vn0 2. https://journals.ph ysiology.org/doi/a bs/10.1152/physre v.1925.5.4.551?jo 3. urnalCode=physre v	C1 C2 C1 C1	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Assessme nt, MST based Assessme nt) OSPE SDL Evaluation
Hypoxia, hypercapnia, cyanosis	 Define hypoxia and hypercapnia. Enumerate and explain its various types. Enumerate the roles of oxygen therapy in different types of hypoxia 	 Ganong's Review of Medical Physiology.25TH Edition.Section 06, Respiratory Physiology (Chapter 35, Page 646,650) Physiology by Linda S. Costanzo 6th Edition.Respiratory Physiology (Chapter 5,Page 239) Physiological Basis of Medical Practice by Best & Taylor's.13th Edition.Section 05,,(Chapter 41,Page 653) (Chapter 42,Page 662) Textbook of Medical Physiology by Guyton & Hall.14th Edition. (Chapter 43, Page 546) 	 https://youtu.be/wt nqgs3Fg https://www.very wellhealth.com/h y poxia-types- symptoms-and- causes-2248929 	C1 C1	SDL	MCQ SEQ VIVA VOCE MCQ (LMS based Assessme nt, MST based Assessme nt) OSPE SDL Evaluation

		Practicals			
Topic	Learning Objectives	Reference	Learning Domains	Learning Strategy	Assessment Tools
Measurement of different lung volume & capacities with the help of spirometer	 Description of its various parts Importance of spirometer for measurements of various volumes Define various lung volumes & capacity How to measure them 	Practical Notebook of Physiology First year MBBS by Dr Saqib Sohail	C1/C3 A3 P3	Practicals /skill lab	Viva Voce Ospe Video Assissted Assessment
Recording of normal and modified movement of respiration (Stethography)	 Introduction to stethography How to use it and its clinical importance 	Practical Notebook of Physiology First year MBBS by Dr Saqib Sohail	C1/C3 A3 P3	Practicals /skill lab	Viva Voce Ospe Video Assissted Assessment
Clinical examination of chest for respiration	 Detail introduction and explanation about inspection Palpation Percussion Auscultation 	Practical Notebook of Physiology First year MBBS by Dr Saqib Sohail	C1/C3 A3 P3	Practicals /skill lab	Viva Voce Ospe Video Assissted Assessment

	Biochemistry			
	Theory			
Topic	Learning Objectives At the end of lecture students should be able to	Learning Domain	Teaching Strategy	Assessment Tool
DILA IDIZA	Define of pH and pKa PL	C1	I GIG	MCQs SAQs
PH And PKA	 Elaborate Henderson Hasselbalch equation. Describe Measurement of pH by equation. 	C2 C2	LGIS	Viva
Body buffers	 Define buffers. Discuss Mechanism of various buffers in maintenance of blood pH. 	C1 C2	LGIS	MCQs SAQs Viva
Electron transpor	 Describe Components/ complexes of electron transport chain. Enlist Enzymes and Co-enzymes of each component. 	C2 C1	LGIS	MCQs SAQs Viva
t chain	• Enlist Inhibitors of these complexes.	C1		MGO GAO
Mechanisms of energy generation in the	 Discuss various mechanisms of energy generation in the body. Discuss Oxidative phosphorylation. Describe uncouplers. 	C2 C2 C2	LGIS	MCQs SAQs Viva
body. Energy change.	 Define the terms: Free energy change. Standard free energy. 	C1	LGIS	MCQs SAQs Viva
	Describe various sources of electrons.	C2		
Vitamins	 Define Vitamins Discuss the distribution, daily requirement and deficiency of vitamins Clinical indication of vitamins 	C1 C2 C2	LGIS	MCQs SAQs Viva

	Define xenobiotics	C1 C2		Mo	CQs SAQs
Xenobiotics	Discuss its metabolism and its role in environment		LGIS		Viva
Topic	Learning Objectives At the end of lecture students should be able to	Lear	rning Domain	Teaching Strategy	Assessment Tool
	Define buffers.		C1	SGD	MCQs
Body buffers	• Discuss Mechanism of various buffers in maintenance of blood PH.		C2		SAQs Viva
	• Enlist Components/ complexes of electron transport chain.		C1		
Electron transport	Describe Enzymes and Co-enzymes of each component.		C2	SGD	MCQs
chain	• Discuss Inhibitors of these complexes.		C2		SAQs Viva
Mechanisms of	• Describe various mechanisms of energy generation in the body.		C2	SGD	MCQs
energy generation	Discuss Oxidative Phosphorylation.		C2		SAQs
in the body.	Describe uncouplers of ETC.		C2		Viva
	Define Vitamins	C	C1 C2 C2		
Vitamin	• Discuss the distribution, daily requirement and deficiency of vitamins			SGD	MCQs
	Clinical indication of vitamins				SAQs
					Viva

Topic	Learning Objectives At the end of lecture students should be able to	Learning Domain	Teaching Strategy	Assessment Tool
	• Define of pH and pKa	C1		
HH equation	Elaborate Henderson Hasselbalch equation.	C2	SDL	MCQs SAQs
	• Describe Measurement of pH by equation.	C2		Viva
	• Define buffers.	C 1		
Role of Chemical	 Discuss Mechanism of various buffers in maintenance of blood pH. 	C2	SDL	MCQs SAQs
Buffers in pH regulation	• Elaborate the carbonic acid-bicarbonate buffer system			Viva
	Measure the pH of solution in Pharmaceutical, Chemical, and Biotechnology Industry	C2		
pH meter and	• Elaborate the Bicarbonate and Phosphate system of Buffers and intracellular and extracellular	C1		MCQs SAQs
physiological	proteins		SDL	Viva

buffers in pH regulation		C1		
	• Discuss Vitamin B ₆ , used as a dietary supplement	C2		MCQs SAQs
Vitamin	Describe its deficiency and related clinical disorders	C2	SDL	Viva
Pyridoxine		C2		
	Define xenobiotics	C1 C2		MCQs
Xenobiotics	Discuss its metabolism and its role in environment		SDL	SAQs
				Viva

	Practicals					
Topic	Learning Objectives	Learning Domain	Teaching Strategy	Assessment Tool		
	At The End Of Practical Students Should Be Able To					
Henderson Hassel batch equation	Illustrate Henderson Hassel batch equation. Measure pH by equation.	P	Skill lab	OSPE		
Buffers	Illustrate buffer actions and buffer zone.	P	Skill lab	OSPE		
pH meter	Measure the acidity or basicity of water-based solutions	P	Skill lab	OSPE		

Basic and Clinical Sciences (Vertical Integration)

	Anatomy, Physiology & Biochemistry						
	Clinical Themes						
Subj	Subject Topic Learning Objectives		Learning Domain				
		At the end of the lecture the student should be able to					
Anaton	• Lung's cancer	Apply basic knowledge of subject to study clinical case.	C3				
	Chest trauma	Apply basic knowledge of subject to study clinical case.	C3				
Physiolo	gy • Wheeze/Stridor	Apply basic knowledge of subject to study clinical case.	C3				
	Crib Death	Apply basic knowledge of subject to study clinical case.	C3				
Biochemi	stry • CBL-ABGs	Apply basic knowledge of subject to study clinical case.	C3				
	CBL – uncouplers	Apply basic knowledge of subject to study clinical case.	C3				

	Pathology					
	Theory					
Topic	At the End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool		
	Discuss Pneumonia in detail.	C1				
	Discuss Tuberculosis in detail.	C1				
Clinical disorders	Discuss Cystic fibrosis in detail.	C1	LGIS	MCQs		
of Respiration:	Discuss Respiratory Failure Incidence in detail.	C1				
	Discuss Sign and symptoms in detail.	C1	-			
	Discuss Pathophysiology in detail.	C1				

	Surgery			
	Theory			
Topic	At The End Of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
GI D C	• Describe:	C2		
Chest Deformities (Congenital)	• Various chest deformities & congenital malformations		I CIG	MGO
	Significance of deformities	C2	LGIS	MCQs
	General and operative management outline	C2		
	• Describe:	C2		
	Various types of Pnuemothorax		LGIS	1400
Pneumothorax	• Causes	C2		MCQs
	Signs and symptoms Significance of tension pneumothorax	C2		
	Emergency and definitive management	C2		
	• Describe:	C2		
	Various types of Hemothorax		I GIG	1400
Hemothorax	Causes of Hemothorax	C2	LGIS	MCQ
	Signs and symptoms of Hemothorax	C2		
	Emergency and definitive management			
	• Describe:	C1		
	Definition			1.600
Pleural effusion	• Causes	C2	LGIS	MCQ
	• Signs &symptoms	C2		
	General and operative management outlines			

	ENT					
Theory						
Topic	At The End Of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool		
	Define tonsillitis	C1				
Tonsillitis	Enlist the causes of tonsillitis	C1	LGIS CBL	MCQs		
	List the clinical features of tonsillitis	C2				
	Enumerate the management of tonsillitis	C1				
Foreign body nose	Classify foreign bodies	C1	LGIS CBL	MCQs		
& ear	Enumerate emergency situations for removal.	C2				

	Medicine			
	Theory			
Topic	At the End Of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
	• Discuss TB.	C2	LGIS	MCQs
Tuberculosis	Discuss its diagnostic Criteria.	C2		
	Describe How to treat a patient with TB.	C2		
Drowning & Strangulation	Discuss How to manage a patient with drowning and strangulation.	C2	LGIS	MCQs

Spiral Courses

Content

- Longitudinal Themes
 - o The Holy Quran Translation
 - o Behavioral Sciences & Biomedical Ethics
 - o Climate Change & Health & Community Medicine
 - o Artfifiial Intelligence (AI)
 - o Family Medicine
 - o Early Clinical Exposure (ECE)

Behavioral Sciences & Biomedical Ethics					
Theory					
Topic	At the End of Lecture Students Should Be Able To	Learning	Teaching Strategy	Assessment Tool	
		Domain			
Crises intervention and disaster	• To be able identify crises situations and learn the means to cope	C1 C2	LGIS CBL		
	with them during disasters either natural or man made			MCQS	
Conflict resolution and empathy	• To be able to identify crises situations and using empathy how to	C2	LGIS CBL		
	deal with these situations arising in clinical practice			MCQS	

	Climate Change & Health & Community N	Medicine			
Theory					
Topic	At the End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool	
Air and Ventilation Air composition &	 At the end of the session the students will be able to: Enlist indices of thermal comfort 	C1			
indices of thermal comfort	Describe the factors responsible for vitiation of air	C2			
	Define air pollution	C1	LGIS	MCQ	
Air pollution and its factors	Identify sources of air pollution and air pollutants	C1			
Preventive	Demonstrate selection of air sample for analysis	C2			
measures to control air pollution	Enumerate the methods to prevent & control of air pollution	C1			
Air purification methods	Enlist natural and artificial methods of air purification.	C1			
	Describe the greenhouse effect	C2			
Greenhouse effect	Enlist greenhouse gases.	C1			
	Identify sources of greenhouse gases	C1			

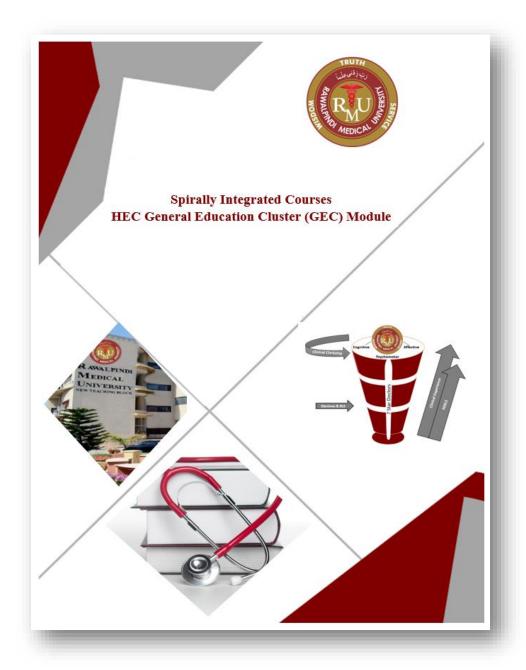
	Demonstrate global warming.	C2	
climate change	Define ozone hole.	C1 C2	
	• Describe link between global warming and climate change		

Artificial Intelligence (AI)					
Theory					
	Topic	At the End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
	Artificial Intelligence basic concepts	To learn the concept of deep and superficial neural networks in AI	C2	LGIS	MCQs

Family Medicine						
Theory						
Topic	At the End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool		
	Define cough & hemoptysis.	C1				
Approach to a Patient with	Discuss differential diagnoses cough & hemoptysis.	C2	LGIS	MCQs		
cough & hemoptysis	When to refer a patient of cough & hemoptysis to	C2				
	pulmonologist					



Spirally Integrated Courses HEC General Education Cluster (GEC) Module



Introduction

Preamble

In alignment with the Higher Education Commission's Undergraduate Policy 2023 and the Pakistan Medical and Dental Council's Guidelines 2024, This comprehensive module is designed to enrich the MBBS curriculum with a broad spectrum of interdisciplinary competencies.

The General Education Cluster encompasses essential domains—Leadership, Information Technology, Entrepreneurship, Expository Writing, Art and Humanities, Research, Bioethics, and Quran Translation—integrating these elements into a cohesive learning experience that extends across the five-year MBBS program.

This module is meticulously structured to enhance both professional and personal development, ensuring that medical graduates are not only adept in clinical skills but also well-rounded individuals equipped with a diverse skill set.

Rationale for the General Education Cluster Module

The General Education Cluster Module is conceived to address the multifaceted demands of modern medical education and practice. In accordance with the Higher Education Commission's Undergraduate Policy 2023 and the Pakistan Medical and Dental Council's Guidelines 2024, this module is designed to create a comprehensive educational framework that extends beyond traditional medical training.

he rationale behind this integrative approach includes:

1. Holistic Development: Medicine is a field that requires not only technical proficiency but also leadership, ethical judgment, and effective communication. By incorporating Leadership, Information Technology, Entrepreneurship,

VERSION 1.1 UNDERGRADUATE **EDUCATION POLICY** Effective from Fall 2023 Curriculum Division **Higher Education Commission** Government of Pakistan

Expository Writing, Art and Humanities, Research and Bioethics, and Quran Translation into the curriculum, the module aims to develop well-rounded professionals who excel in both clinical and non-clinical aspects of healthcare.

- 2. Adaptation to Technological Advancements: The rapid advancement of technology and artificial intelligence is transforming healthcare. Proficiency in Information Technology and AI is crucial for modern medical practitioners to effectively use digital tools, engage in data-driven decision-making, and contribute to innovations in patient care and research.
- 3. Leadership and Management Skills: Effective leadership and management are essential for navigating the complexities of the healthcare environment. By focusing on leadership skills, the module prepares students to lead teams, manage healthcare systems, and address challenges with strategic vision and ethical integrity.
- 4. Entrepreneurial Mindset: Entrepreneurship fosters innovation and problem-solving. By integrating entrepreneurial principles into the curriculum, students are encouraged to think creatively, develop new healthcare solutions, and drive positive change in the industry.
- 5. Enhanced Communication Skills: Expository writing is a fundamental skill for clear and effective communication in medical practice. Mastery of this skill is vital for documenting patient care, conducting research, and engaging in academic discourse.
- 6. Cultural and Ethical Awareness: The inclusion of Art and Humanities helps students understand the broader human context of medicine, fostering empathy and cultural sensitivity. Concurrently, the continued study of Quran Translation and Islamiyat reinforces the integration of cultural and ethical perspectives with medical practice.
- 7. Strengthening Research and Bioethics: Advanced knowledge in research methodologies and bioethics ensures that students are well-prepared to conduct and evaluate research ethically, contributing to the advancement of medical science while adhering to high standards of ethical practice.

of leading, innovating, and communicating effectively in a complex and dynamic field.

8. Preparation for a Dynamic Healthcare Environment: The General Education Cluster Module equips students with a diverse skill set necessary to thrive in a rapidly evolving healthcare landscape. It prepares them to be versatile, innovative, and ethical practitioners capable of addressing the multifaceted challenges they will encounter.

In essence, this module represents a strategic response to the evolving needs of the healthcare profession, ensuring that medical graduates are not only technically proficient but also capable

Alignment of RMU Spiral Courses as per HEC Undergraduate Policy 2023 and Guidelines of PMDC 2024

Title	Hours recommended by HEC/PMDC (to be covered from 1 st to 4 th year)	Teaching hours in RMUCurriculum
Quran Kareem	50 hours (PMDC)	55 Hours
Bioethics / Professionalism	25 Hours (PMDC)	50 Hours
Leadership	25 Hours (PMDC)	30 Hours
Islamic Studies	2 credit hours (HEC)	17 Hours
Ideology & Constitution of Pakistan/Pakistan Studies	2 credit hours (HEC)25 hours (PMDC)	17 Hours
Quantitative Reasoning/Research	2 credit hours (HEC)100 Hours (PMDC)	120 Hours
Entrepreneurship	2 credit hours (HEC)	50 Hours
Arts and Humanities (Videography)	2 credit hours (HEC)	20 Hours
Expository writing	2 credit hours (HEC)	16 Hours
Applications of information and	2 credit hours (HEC)25	25 Hours
communication technologies (ICT)	Hours (PMDC)	
Family medicine		30 Hours
Artificial intelligence		25 Hours
Behavioral Sciences	100 Hours (PMDC)	150 Hours

- 1 credit hour = 16 teaching hours
- The minimum requirement for the general education component is 30 credits in all the undergraduate/equivalent degree programs including associate degree. References: undergraduate-policy-2023-1pdf/261474627

The Holy Quran Translation

The Quran Translation Course for undergraduate medical students is designed to deepen students' understanding of the Quran by focusing on the translation of key verses and chapters. This course aims to foster spiritual growth, enhance ethical decision-making, and integrate Islamic values into medical practice. Students will explore themes such as compassion, patience, and justice, which are fundamental to both Islamic teachings and the medical profession. By connecting Quranic principles with their daily work, students can develop a more holistic approach to healthcare, rooted in empathy and moral integrity.



Rawalpindi Medical University



The Holy Quran Curriculum

Lectures Distribution as per Criteria

اول تا پنجم	بی بی ایس سال	جماعت ایم	ترجمعه برائے	القرآن بمعه

کل	شرت	معان	للات	معاه	قيات	اخلا	دات	عباه	لیات	ايماة	ti
ليكچرز	ليكچر	فيصد	سال								
17	2	12	2	12	2	12	5	29	6	35	سال اول
17	2	12	2	12	3	18	4	24	6	35	سال دوئم
17	2	12	3	18	4	24	4	24	4	24	سال سوئم
17	4	24	4	24	4	24	2	12	3	18	سال چهارم
17	4	24	4	24	5	29	2	12	2	12	سال پنجم
85	14		15		18		17		21		كل ليكچرز

سال اول	لیکچر نمبر
تعارف قرآن و فضائل قرآن	1
قرآن و میڈیکل سائنس	2
ايمانيات	
فرآن مجيدكا خلاصه مسئله توحيدكي وضاحت	3
پریپزگا روں کی صفات ۔ جنت اور جہنم کے کچھ مناظر اور جنتی اور جہنمیوں کی باہم گفتگو	4
الله تعالی کی دس صفات عضیمه	5
حضرت عزیر علیه لسلام اور حضرت ابراہیم علیه لسلام کا مردوں کے دوبارہ زندہ ہونے کا مشاہدہ	6
حضرت ابراسیم علیه سلام کا اپنی قوم کو توحید کی دعوت دینے کا خوبصورت انداز	7
رسول الله ﷺ کے انسان کامل ہونے کی دلیل اور قیامت کے کچھ احوال اور الله تعالی کی قدرت کے دلائل	8
عبادات	
عبديت	9
طهارت اور صفائی	10
نماز	11
روزه	12
زكؤة و صدقات	13
اخلاقيات	
 اولاد کی اخلاقی تربیت	14
اخلاق حسنه کے فوائد و فضائل	15
معاملات	
والدين کے حقوق	16
رشته داروں اور عام مسلمانوں کے حقوق	17
معاشرت	
پرده	18
ردگاری اور درگاری کا النام	10

Islamiat

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

راوليذى ميذيكل يونياء تناواه ليفاى عِنْهِ وَلِشَلِ الْمِلْوَالِينَ أماب برائے اماا میات املاميلت りちルンスン(Jan=とう.1 CE POSTE OR OF THE STAND OF STANDERS . 2 3. دمالت معلق نساب كا آيك كالتداد توق A. درمالت كاتوكادد فراق مغيزم ادر ملات كاخرورت 5. آفرت كامنى م يدواى كي خرود ت اود تخت 6. مشيعة فرت كاستيوم عدال كاشرورت عور تحت 7. العاست على خال خال المات كالرائد والعاد الدائد كالرود 8. يسر بالمسروف إدر في عن المقرع معلى أيات ورام بالعروف في الصالحر كي خرورت وراس كرامول، شرويا 5 74-16 TUBONE 10. عنون العباد (بان، مزت مال، قيره 11. السانول عن مساوات و ين آزادي ميرث صول انساف £1137 .12 13. على كالميد (اماريك كادر أن على) 14. اعلى داران المحالية المحال 15. ير فض كاذمدوى ورائين كالمان فالدو تايي) 16. اجتاب 17. خطير جيد الودارا Director Medical Colucation Revolpted Medical University

Pakistan Studies

The Pakistan Studies Course for undergraduate medical students offers an overview of Pakistan's history, culture, and civic structure. It highlights the country's development and its healthcare challenges, helping students understand the socio-political context of medical practice in Pakistan. The course fosters responsible citizenship and awareness of the role medical professionals play in nation-building.



Bioethics

The Bioethics Curriculum for undergraduate medical students integrates ethics and professionalism as a core, longitudinal theme across all five years of medical education. It aligns with global standards set by organizations like WFME and ACGME, as well as national guidelines from the Pakistan Medical Commission (PMC). The curriculum emphasizes key ethical principles such as patient welfare, autonomy, and social justice, while fostering professionalism, compassion, and accountability in medical practice. This integrated approach aims to develop not only scientifically competent doctors but also ethically responsible and community-oriented physicians.

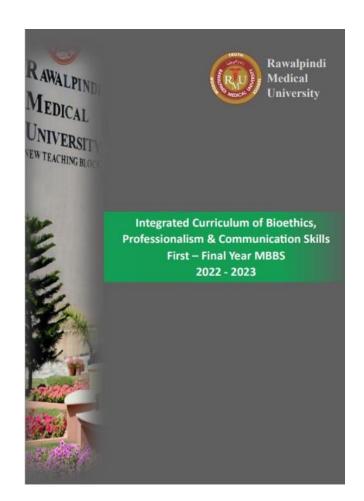
At Rawalpindi Medical University (RMU), bioethics education includes both theoretical instruction and practical learning, drawing on national resources like the National Bioethics Committee (NBC) of Pakistan and international guidelines such as the WHO Bioethics Curriculum. The curriculum covers critical themes such as the doctor-patient relationship, professional integrity, conflict resolution, and group dynamics, ensuring that students are equipped with the skills necessary for ethical decision-making and compassionate care. Assessment of bioethics is incorporated throughout the program, with a focus on cultivating critical thinking, communication skills, and a humanistic approach to healthcare.



Biomedical Ethics Curriculum



Framework of Bioethics Curricula at Rawalpindi Medical University



Module - I - Foundation Module

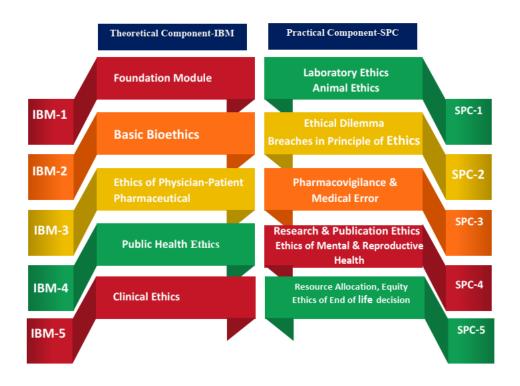
Theoretical Component (Integrated Bioethics Method: IBM-1) Theme:

In first year MBBS, Theoretical component (UGBC-1) aims to make new entrants cognizant with historical perspective of Medical ethics. The history of medical ethics developed over centuries, as it has been highlighted that ethics are "...born in scandal and rendered in protectionism. In the allopathic system of medicine, such developments commenced from the time of Hippocrates (the Hippocratic Oath) and over time, it has led to development of several codes. (These include the Helsinki Declaration, World Medical Code and Belmont Report).

Since ethics is context specific entity and influenced by sociocultural and religious perspective, development of bioethics curriculum based on country and religious specific situations is considered very necessary to make teaching of ethics more relevant. Moreover, ethical requirement ethical Code of Conduct & Professionalism as per statutory body PM&DC.

Practical Component (Student Practical Component: SPC-1) Theme

An Empirical Approach towards making undergraduate medical students cognizant about Ethical Dilemma in historical perspective of medical ethics and its relevance in teaching Ethics in the Medical Curriculum. Understand the importance of maintaining animals' rights and dignity while performing animal experimentation. Establish professionalism and Communication skills during Laboratory sessions . Make the students learn how to collaborate with each other to work effectively as team member, how to maintain team dynamics, show mutual respect and complete assigned task in professional manner.



Ethics Curriculum 1st year MBBS

	Theoretical Component (Integrated Bioethics Methods -1)								
	Broad Major syllabus Learnin	Assessment tools	Suggested reading sources						
	Cognitive Domain								
Introduction to History of Medical Ethics	Discussion will cover; Introduction to the Hippocratic Oath (5th Century BCE), basis of modern oaths administered to medical graduates Understand evolution of contemporary bioethics, its characteristics and relevance to research and practice	At the end of the session students should be able to; • Appraise the historical perspective of Hippocratic Oath (5th Century BCE). C2 • Understanding the beginnings of Contemporary Bioethics to address ethical dilemmas raised by rapid advances in medical science and biotechnology. C2	LGIS 1hr contact session in 2-4 parallel classes will be conducted by Senior Faculty from basic sciences (Anatomy, Physiology & Biochemistry)	1 MCQs of level C1 to C3 in relevant block examination Result / marks obtained will contribute towards Internal assessment (IA) in 1st Prof. MBBS exam.	Guidelines and Teachers Handbook for Introducing Bioethics to Medical and Dental Students http://nbcpakistan.org.pk/as sets/may-16-bioethicsfacilitator-bookmay16%2C-2017.pdf Pakistan Medical and Dental Council, and Higher Education Commission, Islamabad. Curriculum of MBBS. Date unknown [cited 2019 Jun 30]. Available from: http://pmdc.org.pk/LinkClic k.aspx?fileticket=EKfBIOS DTkE%3d&tabid=102∣ =556 WHO: Module for Teaching Medical Ethics to Undergraduates file:///C:/Users/drkas/Downl oads/WHO%20Module%20 for%20Teaching%20Medic al%20Ethics%20to%20Und ergraduate.pdf				

•Islamic concept of Bioethics: Perception, Scope and Application in medical and healthcare	At the end of the session students should be able to; • Enlist 5 principles of medical Ethics. C1 • Correlate the concept of Islamic principles of medical ethics with its application in medical and healthcare settings .C2	LGIS 1hr contact session in 2-4 parallel classes will be conducted by Senior Faculty from basic sciences (Anatomy, Physiology & Biochemistry)	1 MCQs of level C1 to C3 will cover this session teachings in relevant block examination Result / marks obtained will contribute towards Internal assessment (IA) in 1st Prof. MBBS exam.	Regional Committee for the EM/RC52/7 Eastern Mediterranean Islamic code of medical and health ethics https://applications.emro.who.int/docs/em_rc52_7_en.pd f Islam and the four principles of medical ethics Mustafa, Y. (2014). Islam and the four principles of medical ethics. Journal of Medical Ethics, 40(7), 479–483. doi:10.1136/medethics-2012-101309 Ahmed AS (1993) Living Islam. (BBC Books, London), pp 21–56.Google Scholar Gatrad AR, Sheikh A Medical ethics and Islam: principles and practice. Archives of Disease in Childhood 2001;84:72-75.
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—	D: ' '11	A1 1 C.1	T CIG	1 1 1 01 4 02 31	DMDC C 1 (E4):
que	Discussion will cover;	At the end of the session students should be able to	LGIS	1 MCQs of level C1 to C3 will	PMDC Code of Ethics:
, On	• Introduction to	should be able to	1hr contact session in	cover this session teachings in	http://www.pmdc.org.pk/Li
) J(Professional Ethics and PM&DC Code	~	2-4 parallel classes conducted	relevant block examination	nkClick.aspx?fileticket=v5
de (of Conduct	• Cognizant with need for	by G. C. L.	Result / marks obtained will	WmQYMvhz4%3D&tabid=
Ŝ	Purpose of medical code of conduct	-	Senior faculty	contribute towards Internal	102∣=554
OC	by Regulatory body	code of conduct by		assessment (IA) in 1 st Prof.	
<u> </u>	PM&DC covering	PM&DC.C1		MBBS exam.	
P	following subtopics				
nud	• What Is the 'Professional Ethics and	Endoorate the purpose and			
e so	Code of Conduct'?	relevance for medical code of			
ţ t i:	• Why to Have	conduct at undergraduate level .			
al E	the Code of Conduct?	C2			
Introduction to Professional Ethics and PM&DC Code of Conduct	 Who Needs to Follow the Code of 				
fess	Conduct?				
Pro	• Who is it for?				
to]	 What Are the 				
ion	Code of				
uct	Conduct				
rod	Requirements?				
Int	1				
	Discussion on History of medical	At the end of the session students	LGIS	1 MCQs of level C1 to C3 will	Guidelines and
	ethics focusing;	should be able to;	1hr contact session in	cover this session teachings	Teachers Handbook for
			2-4 parallel classes,	Result / marks obtained will	Introducing
	•Historical perspective of Tuskegee	• Explain the meaning of the	Conducted by	contribute towards Internal	Bioethics to Medical
	studies,	term	Senior faculty.	assessment (IA) in 1 st Prof.	and Dental Students
ıics	Willow brook	"ethics".C1		MBBS exam.	
of Medical Ethics	Experiment				http://nbcpakistan.org.p k/assets/may-
ical		Describe the historical			16bioethics-facilitator-
[ed]		perspective of global development			bookmay-16%2C-
f N	•Codes of medical ethics: traditional	of medical ethics. C1			2017.pdf
5	foundations and contemporary				The Nuremberg Code:
Histor	practice	• Describe the codes of			http://www.hhs.gov/ohr
Ξ		medical ethics and			p/archive/nurcode.html
	•Nuremburg code,	their implications.C1			
	Belmont report,	Recognize ethical issues			10 WMA Declaration of Helsinki:
	Declaration of Helsinki and	relevant to the case situation and			http://www.wma.net/en
	importance of historical background	apply the ethical codes as			/30publications/10polic
	of ethics in current research trends	appropriate.			ies/b3/
					100/00/

	 General ethical principles including explanation of 04 basic principles of Beneficence, nonmaleficence, respect and justice. Interpretation research ethics for; Informed consent and confidentiality in research HR 	• Discuss the development of indigenous ethical codes in the SouthEast Asian Region. C2. Demonstrate sensitivity to cultural diversity in medical care. C3			CIOMS Guidelines: http://www.cioms.ch/p ublications/layout_guid e2002.pdf. Nuffield Council on Bioethics Guidelines: http://www.sirc.org/ne ws/nuffield.shtml
Laboratory Ethics	Discussion will cover basic elements of Laboratory Ethics focusing; • Importance of medical professionalism for the medical student; including respect and gratitude towards colleagues • Code of conduct: Collaboration, partnership, Teamwork, Maintaining dress code, religion obligations of medical doctor, focus on physicians' character, virtues and duties Delineate the ethical consideration	 Show Respects other health professional team members and complete assigned task in professional manner. A1 Employ collaborative negotiation to resolve conflict, anger, confusion 	Case based discussion in 2 hr contact session in 4-6 parallel classes conducted by faculty of respective departments Role plays Reflective writing	Assignment based assessment under aggregate Marks (Internal Assessment) 1 MCQs of level C1 to C3 s in relevant block examination OSPE in practical exam of relevant block examination Result / marks obtained will contribute towards Internal assessment (IA) in 1st Prof. MBBS exam.	- Real life scenarios in form of Case base learning /problem based learning To be share with students one week before the session Introduction to criteria for assessment of behavior, code of conduct and professionalism at RMU
Ethics of research involving animals	 while performing procedures on real Scientific rationale for using animals in different phases of teachings of medical students 	 and misunderstanding. A2 Understand the importance of maintaining animals rights and dignity while performing animal experimentation 	interactive parallel sessions	Students seminar/ group presentation OSPE in practical exam of relevant block examination	https://www.nuffieldbi_oethics.org/wpcontent/uploads/Theethics-of-researchinvolving-animals-fullreport.pdf

Understand the historical Short presentation: Ethical Role plays Cases in Medical perspective of medical ethics and principles in medical practice • Historical perspective of famous Video demonstration Ethics https://www.scu.edu/et • Brainstorming: interactive ethical dilemmas and its relevance its relevance in development of hics/focusareas/bioethic with development of codes and modern codes and law session to identify the s/resources/cases-inmedical-ethics-"The Deadly potential breaches of ethical studentled-discussions/ components of contemporary Deception," Nova video written, produced and WHO Handbook of bioethics (an individual components Explicate the background of principle in medical practice. • Group work: Measures to will be expanded/repeated using real ethical codes and importance of Medical Ethics: Part 1/ Chapter 1: Ethics directed promote ethical principles in cases from historical breaches in ethics in history of health research and medical ethics and Chapter 2: Human by Denisce Di Anni, WGBH medical practice. ethics) civilization and medical ethics from WHO Boston, 1993 production. Handbook of Medical This video is owned by many Ethics, 2009 libraries and is currently **Ethical Dilemma** distributed by Films for the George J Annas; Humanities and Sciences, P.O. Box Michael A Grodin, eds. The Nazi doctors and the Nuremberg Code: 205, Princeton, NJ 08543-2053 human rights in human https://onlineethics.org experimentation, New cases/ethics-York: OUP; 1992 scienceclassroom/tuskegeesyphilisstudy Watts J. Tokyo Victims of Japan's notorious Unit 731 sue. Lancet. 2002 August 24; 360 (9333): 628 Final Report of the Tuskegee Syphilis Study Legacy Committee1. University of Virginia Health Systems. 1996.

Leadership & Professionalism

Professionalism in medicine is the foundation of public trust in healthcare providers, encompassing values such as competence, integrity, ethical conduct, and accountability. It involves prioritizing patient welfare, maintaining confidentiality, effective communication, and continuous professional development. Rawalpindi Medical University (RMU) integrates professionalism throughout its curriculum to prepare students for the complexities of healthcare, fostering respect, accountability, and compassion. Through theoretical instruction, practical training, and mentorship, RMU emphasizes ethical conduct and patient-centered care. This approach ensures that graduates are not only skilled but also committed to improving healthcare standards and outcomes with integrity and professionalism.

1st Year MBBS:

Focus: Introduction to Leadership Concepts and Self-Awareness

Interactive Lectures:

Leadership Concepts (1 hour)

Differences between a leader and manager Types of leadership

Leading groups and teams (1 Hour)

Group dynamics Types of team members Roles in teams

Group Leadership Exercise:

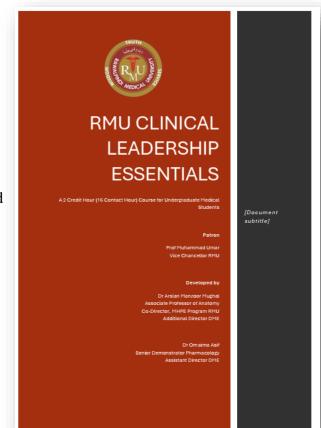
Perform various roles (Group leader, Scribe, time keeper etc) in Problem Based Learning teams (1 Hours)

Self-Assessment:

Conduct initial self-assessment using tools like leadership style and Big five personality tests (1 Hour)

Reflective Journaling:

Write online reflections on your experiences



Behavioral Sciences

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.

Foundation Module

Topic	At The End Of Lecture Students Should Be Able To	Learning Domain	Mode of Teaching
Introduction to behavioral sciences	The student should be able To define bio-psychosocial model of health care To describe Holistic and Traditional Allopathic medicine. To obtain information from the patient according to bio-psychosocial model	C1/C2	LGIS
Management of stress	The student should be able To define stress and its types of stress To enlist causes of stress To describe ways to manage stress To interview a patient suffering from stress	C1/C2	LGIS

MODULAR CURRICULUM OF BEHAVIOURAL SCIENCES FOR FIRST YEAR MBBS

Institute of Psychiatry

Benazir Bhutto Hospital

Year	LGIS	SDL	CLINICAL ROTATION		Total
1 st Year	12 hours	20 hours	No clinical rotation	No clinical rotation	
2 nd Year	8 hours	20 hours	No clinical rotation		28 hours
3 rd Year	12 hours	30 hours	20 hours 8am-10:30am 4 days a week, 2 weeks rotation	28 hours 2pm -6pm 7 days in 2 weeks rotation	90 hours
Total					150 hours

MSK-I Module

Topic	At The End Of Lecture Students Should Be Able To	Learning Domain	Mode of teaching
Healthcare models and their clinical application • Bio-psychosocial model • Integrated health care model • Publica health care model	The student should be able To define bio-psychosocial model of health care. To describe Integrated model of healthcare To describe Public health care model To describe Holistic and Traditional Allopathic medicine. To obtain information from the patient according to bio-psychosocial model Elaborate the importance of health belief model in clinical setting	C1 C2 C2 C1	LGIS
Relevance of ethics in life of a doctor	The student should be able To demonstrate the scope, meaning Guiding principles of medical ethics To address the common ethical issues To address the common ethical dilemmas in health professional life	C3	LGIS

MSK-II Module

Topic	At The End Of Lecture Students Should Be	Learning	Mode of
	Able To	Domain	Teaching
Rights and responsibilities of	The student should be able to		LGIS
patients and doctors	 Understand the rights and responsibilities of 		
	doctors	C1	
	 Understand the rights and responsibilities of 		
	patients	C1	
	Analyze critical situations/ challenges in		
	clinical practice to solve clinical problems		
Psychological relation in	The student should be able to		LGIS
doctor-patient relationship	 Understand the ethical boundaries of 	C2	
	conduct in doctor patient relationship		
	 Understand the phenomena of social 		
	bonding, dependance and resistance	C2	
	 Understand and differentiate 		
	Transference and Countertransference		
	 Elaborate the Unwell Physician / 	C2	
	Burn-out		

CVS Module

Topic	At The End Of Lecture Students Should Be Able To	Learning Domain	Mode of Teaching
Sociology and Health	The student should be able to Explain following cultural and social aspects in medical practice: • Sociology and Health • Social Groups • Social Class • Child Rearing Practices • Roles, Social Support, religion, Stigma, Sick role, Death and Dying • Impact of social factors on Treatment Adherence	C2 C1	LGIS
Anthropology and health	The student should be able to Understand culture in health care Understand the influence of culture on health care Elaborate culturally sensitive clinical assessment	C1 C2	LGIS

Blood & Immunity Module

Topic	At The End Of Lecture Students Should Be Able To	Learnin g Domain	Mode of Teaching
Professionalism in Healthcare	The student should be able to To understand the importance of knowledge, skills and attitude in the clinical settings and dealing with the patients	C1/C2	LGIS
Psychology in Medical Practice	The student shall be able to understand Psychological factors in the aetiology of health problems Role of psychological factors in the precipitation (triggering) of illnesses Psychological factors in the management of illnesses Psychological and social factors in diseases causing disability. handicap and stigma Role of psychological factors in patient's reactions to illness Medically Unexplained Physical Symptoms (MUPS)	C1/C2 C2 C1	LGIS

Respiration Module

Topic	At The End Of Lecture Students Should Be Able To	Learning Domain	Mode of teachin g
Defence mechanism	The student should be able to: Understanding the Purpose and Function of defence mechanism Identifying Common Defense Mechanisms Evaluate Adaptive and Maladaptive Use.	C1/C2 C2	ĹĠĬS
Personality development and theories	The student should be able to Elaborate the developmental theories of Piaget, Erikson and Freud Understand the determinants of personality development Explain the personality types	C1 C2	LGIS

Family Medicine

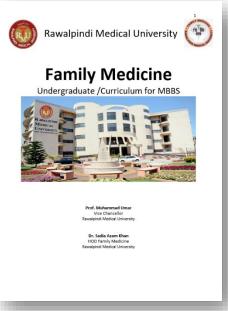
Family medicine is a medical specialty dedicated to providing comprehensive health care for people of all ages and genders. It is characterized by a long-term, patient-centered approach, building sustained relationships with patients and offering continuous care across all stages of life. It focuses 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.

Summary of hours distribution of different teaching methods in Family Medicine training

Activity	Method of learning	Duration of activity	Frequency of activity in days	No of students	Total hours
Lecture to full class	Didactic	45 hours	9	Full class	45 hours
Workshops at campus	Experiential learning	10hours	2	~30	10 hours
Outdoor clinical teaching	Apprenticeship	45 hours	9 days	~2-3 per teacher	45 hours
Total			•		100 hours





Family Medicine Curriculum

Overview Of Training Structure

The total duration of Family Medicine training will be 100 hours. The Family Medicine training will be spread over 5 years with focused learning as follows:

Copic			5.0	Assessment		
	Year of study	Hours	Teaching method	K (Knowledge)	S (Skills)	A (Attitude)
1. Communication skills and consultation skills in Family Medicine Practice	1 st	5	Lectures		Rotation	Rotation
2. Ethics in Clinical Practice	2nd	5	Lectures			
3. Focused history taking, examination & assessment skills	3 rd	10	Lectures	CBD	CBD	CBD
4. Appropriate use of clinical equipment and charts	3 rd	10	Workshop		Rotation	Rotation
5. Define Family Medicine	4 th	1	Lecture	Portfolio		
6. Role of Family Medicine in the health care system	4 th	1	Lecture	Portfolio		
7. Core concepts of Family Medicine	4 th	2	Lecture	Portfolio		
8. Scope of Family Medicine specialty	4 th	2	Lecture	Portfolio		
9. Patient centered approach	4 th	2	Lecture	Portfolio		Rotation
10. Family Medicine rotation in community based Family Practices	4 th	45	Field	Portfolio	Rotation	Rotation
			posting	CBD	CBD	CBD
11. Danger signs and referral system	5 th	2	Lecture	SAQ		
12. Basic concepts of Elderly care	5 th	2	Lecture	SAQ		
13. Basic concepts of Palliative Care	5 th	2	Lecture	SAQ		
14. Practice Management in community setting	5 th	2	Lecture	SAQ		
15. Cost effective and safe approach to Fever without any localizing symptoms in community setting	5 th	1	Lecture	SAQ		
16. Cost effective and safe approach to Generalized weakness in community setting	5 th	1	Lecture	SAQ		
17. Cost effective and safe approach to Generalized aches and pains in community setting	5 th	1	Lecture	SAQ		
18. Cost effective and safe approach to Dizziness in community setting	5 th	1	Lecture	SAQ		
19. Cost effective and safe approach to an unconscious patient in community setting	5 th	1	Lecture	SAQ		
20. Application of Bio-Psycho-Social Model of Healthcare in community setting	5 th	4	Lecture	SAQ		Portfolio

Specific Learning Objectives

Subject	Topic	Hours	S. No	Learning Objectives
		needed		At the end of this module, the students of MBBS will be able to:
A) Populat	ion Centered Care			
Community Social determinants of health 1		1 1		Describe the social determinants of health
medicine	Environmental and climate factors in disease 2 Explain the role of environmental and climate factors in disease		Explain the role of environmental and climate factors in disease causation	
	causation			
	Principles of prevention and health promotion	1	3	Describe the Principles of prevention and health promotion
			4	Describe, the role of counseling and patient education in health promotion and disease prevention
Medical	Patient safety, clinical governance and quality	1	5	Explain the concept of patient safety, clinical governance and quality improvement in primary
education	improvement			healthcare
Family Medicin	ne Violence against Healthcare Professionals	2	6	Describe violence and its types
			7	Explain, how to de-escalate violence against healthcare professionals
			8	Discuss the importance of effective communication
			9	Describe Rights & Responsibilities of Healthcare workers in violent situations
	Gender Based Violence	2	10	Define gender base violence
			11	Differentiate the different forms of gender- based violence
			12	Describe issues of gender, rights, equality, and gender-based violence including knowledge of how
				to access resources and support
			13	Describe the recommended ethical standards for reporting on issues related to the prevention of gender-based violence
			14	Discuss the preventing strategies for gender-based violence
			15	Describe the national and international legal frameworks for gender-based violence
B) Principl	les & practice of Family Medicine			
	M/ History and current structure of general practice	1	16	Describe the historical perspectives of general practice
Medicine			17	Explain the structure of general practice nationally and internationally
	Models of healthcare and universal health	1	18	describe the models of healthcare
	coverage			Learn the concept of universal health coverage
	Ethics in clinical practice	Ethics in clinical practice 2		Define ethics, understand the scope ethical practice to realize the importance of applying ethics in clinical practice
	GP as a coordinator in healthcare (referral		20	Describe the role of a GP in monitoring and coordinating patients' treatment plans, educate them
	mechanisms)			about their condition, connect them with health care providers, and evaluate their progress
			21	Describe the referral mechanisms in healthcare
	Holistic Approach in Family Practice	2	22	Explain the concept of Holistic Care

		23	Discuss Patient centered care
		24	Explain the influence of social, economic and environmental factors on the health status of individuals and groups, and suggest appropriate measures
		25	Discuss delivery of evidence based, comprehensive continuing care to the individuals and families
		26	Discuss quality care in preventive, therapeutic, rehabilitative and palliative curative and preventive domains of health care
		27	Describe effective use of available resources
	Documentation & Medical Records	28	Discuss the importance of documentation in medical practice.
		29	List the main elements of documentation
		30	Documentation of the diagnosis, management plan, treatment, safety netting and follow up
			arrangements
		31	Describe disease notification and reporting in primary care.
	Consultation Models in Family Practice	32	Describe various consultation models
		33	Discuss how to encourage the patient's contribution
		34	Explain, how to put patient's complaint in appropriate psychosocial contexts
		35	Describe patient's ideas, concerns, expectations and shared management plan
Pharmacology	Rationale use of drug prescribing in Family practices	1 36	Explain the steps of rational use of drug prescribing in family practices

Information Technology & 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.





Focus: Introduction to ICT Components, Application Software and Usage, File

Interactive Lectures:

- Introduction to ICT
- Application and System Software
- I/O Devices and Storage Devices
- Types of Software
- File Management (Online)
- Internet and Email (Online)

Collaborative Learning:

Creating an Email Account, sending Emails to Peers, Email Account

Management/Settings

Flipped Classroom:



Artificial Intelligence Curriculum

• Students will be given guidelines to understand File Management, and content will be shared with students. During Class, an activity will be given to manage files on different platforms (Online or Local Directory).

Hands-on Exploration:

• Exploration of the internal Storage of Your Computer System and its properties

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.



Aim

Aim of Integrated undergraduate research curriculum is to create center of excellence for future doctors by establishing intellectual foundation to promote critical thinking and practice evidence based medicine with the aspiration to improve clinical outcomes, population health and health care services delivery across the nation beyond traditional medical care

Objectives

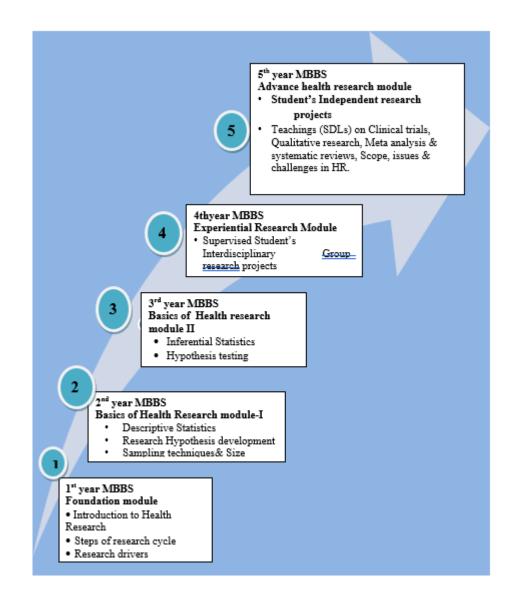
- To develop the research competent behavior in our future seven star doctors.
- The aims & objectives of Integrated Undergraduate Research Curriculum (IUGRC) RMU can be further elaborated as under;
- Enhance the students' capability in performing quality research
- Develop the skill of data collection, analysis and interpret it scientifically.
- Inculcate lifelong self-directed independent learning.
- Develop the skills in critical evaluation and synthesis of new information.
- Inspire the habit of practicing evidence-based medicine.
- Explicit and measurable research related to curricular outcomes should be articulated.
- Promote innovation and research to improve overall health status of the community
- Align collaborative learning and research outcome-based objectives according to the needs of society.



Research Curriculum (IUGRC)

- Develop interdisciplinary research projects to foster overall learning.
- Develop innovative community health needs based research projects to attract research grants.
- Collaboration with HEC, PSCIT, Health department, UNICEF, WHO and other potential agencies for research funding for community need centered proposals.
- Develop institutional culture & infrastructure for long term sustainability and acceptability for research
- Transform medical education with integrated research curricula, e-learning technologies, contemporary infrastructure and community based learning by Developing liaison with medical education, University Library, RSRS and IT Department for the arrangement of research methodology workshops, computer skills & on relevant software's hands on training.
- Collaboration with other departments to promote interdisciplinary research.
- Assess the impact pilot program by program evaluation and 360 degree feedback after five years.
- Regular seminars, conferences and talks on our population health issues & challenges by people from all walks of life and professions, to build communities of practice and interdisciplinary connections to enrich the students' experience.
- Active involvement of all stake holders of Health research ethics, the institutional Committee which should draw upon all disciplines, including the nursing staff, representation from the student body(RSRS), editors of scientific publications and city community representatives. Ethics circle should review proposed research work to develop recommendations from the Code of Ethics given by the PM&DC
- Setting the standard of excellence in research among under graduate medical students;
- Retain, support and attract the diverse pool of highly motivated faculty for mentorship
- Develop field based research projects to gain practical experience of research in communities.
- Involving students in completion of research supportive infrastructure of the institution like demographic, clinical, diagnostics data capturing & achieving project.
- Encouragement & facilitation of participation of medical students in research competitions, seminars, symposia and research outcomes publishing.
- Establish the facility of virtual learning environment including e-learning modalities
- Establish the reward system and annual appraisals
- Alliance with external faculties & institutions for participation and dissemination of scholarly work at national and international level

Schema & Contents of IUGRC At One Glace



Year of MBBS course	Total Hrs. allocated to Com- Med by PMDC	to II V withi M	allocated UGRC ^a isible n overall IBBS etable	C a IUGRC teachings & & class Pattern			Course title			Mode of Teaching
I	25	4hrs	(1/	4 x 4 = 16hrs (1/4th, 4 Parallel LGIS b)						
II	25	6hrs		6 x 4 = 24hrs Basics of Health Research (1/4th, 4 Parallel LGIS) Module-I						
III	50	8hı	r	8 x 4 = 32hrs (1/4th, 4 Parallel LGIS) Basics of Health Research Module-II						
IV Formal Year of CM	150	10 con	20hrs tact session comprising 2hrs	ng 14 (° 14 x2 x 10 =/ small group based 7 sessions each darallel contact sesending over 2hrs	teach ay for ssions	nings) 2day 4, each	ys) h	Experiential Health Research Module	Formal ^d
V	4 (added)	4 hrs		4 x 4 = 16hrs Advance Health Research (1/4th, 4 Parallel LGIS) Module						
	250hrs total (254)	allo	42hrs 5% of tot ecated to 0 OC are de research	CM by voted to		368hrs visible time effort (part of student's regular timetable) in addition to informal contact sessions & Webbased				

Component-I for 1st year MBBS

Premise:

- a. In the first year research relevant teachings are designed to be lighter in contents, softer in transfer but using modern medical teaching methods in the pursuit of active involvement of the students in learning process. Purpose of first year research teachings is to introduce the budding doctors with what & why of health research and able to perceive research needs in their profession context. It is desired to involve students in research process beyond the curriculum needs with a true spirit to best serve the health needs of human community. First year research learning also expose students to published research to enable them to properly understand scientific literature, induce high level thinking and provoke for their individual research ideas.
- b. **Internet based learning:** In addition to formal class divisions for research learning, small groups (7% of total class) are created for the purpose of minute level coaching ("peer-share-learn" Eric Mazur Model) through an internet web based office (WBO) under mentorship of a dedicated faculty for each group. This mechanism operates throughout the MBBS course from 1st to 5th year. Students in initial groups' formation in first year undertake their "group research project" in 4th year in the same group and under same mentor. Role of mentor at this stage of learning is to transfer both the technical and ethical aspects of good standards and practices. Mentors will be responsible for professional development that includes both explicit conduct of scientific research and implicit development of standards of research including norms of confidentiality, respect, communications and judgment.
- Using the **Peer Instruction Method** students complete work *prior* to the lecture by reading *assigned course readings and review of literature available*, and then answer questions individually by logging onto the course webpage to record their answers. This method builds in student accountability. Next session begins with a student question which is obtained from the course website after reviewing student answers. Each student records his or her answer through web to assigned supervisor by using either their smart phone or laptop.
- c. Course outlines for each formal contact session are notified one week before for prior readings & coming to class with prepared minds, under intimation that their level of prior preparedness on the session topics are judged by questioning at the start & during session and the results are reflected in log-books accordingly. Students in groups are guided on pre- & post contact sessions work through WBO and are provided with learning resources including books, journals and free web based lectures & exercises etc.

a. Schedule of Assessment:

- a. 1 MCQs covers each of the four session's teachings in relevant block examination and 04 MCQs in total under 04 max marks. Result / marks obtained contribute towards Internal assessment (IA) under total max 04 marks in 1st Prof. MBBS exam.
- b. At the end of module or 4th contact session each individual student is required to submit a one page individual research proposal based upon his learning experience under given specifications, guidelines and schedule of submission by the relevant faculty in charge (**Reflective writing**). Work output of each student is assessed under total 06 marks. Result share in IA in 1st Prof. MBBS exam.
- c. **Overall assessment:** Each student is subjected to assessment under max 10 marks (04 for MCQs and 06 for assignment-Reflective writing) and result is made part of IA in 1st Prof. MBBS exam. Student's credits are also entered in log book.

		Contact session-1; Duration 60-90 min		
	ace fresh medical students to health research	in a soft way and to inculcate a pro research attitude in vele, fundamental types & drivers of research and resea		BBS Students
	utlines for the session	Learning outcomes	Teaching strategy	Assessme nt tools
Back human period to Health Research (HR) & Defin research Cycle (Health Research Cycle (HR) & Defin research Cyc	asic & Applied Research uantitative & Qualitative Research ollaborative & Multidisciplinary research ealth Research triangle ers of research Including; uriosity ealth needs pportunity offit : 60-90 min	 At the end of the session students should be able to; Appreciate role of HR in healthcare practices and human development Define HR and illustrate its meanings State steps of Research cycle Identify various types and fields of health research Explain how various drivers of research play role in selecting a field of research. 	b. One week before students are communicated on prior readings through WBO. c. Long Group Interactive Session (LGIS) d. Duration- 60-90m e. 2 parallel classes are conducted by Senior Faculty (AP or Subject Specialist) -Attendance are monitored objectively	1 MCQ (C1-C3)
Session theme: Students will required to undertake a healt		arch Process and attributes of the researcher to underst	and scientific needs of research activity and the cap	acities
Sess Session course outline ion title		Learning outcomes	Teaching strategy	Assessme nt tools
Discussion will cover Characteristics of Research Systematic, Rigorou valid, verifiable, regressioning and use of the Attributes of Research Honesty & Rigor, Curpurpose, Objectivity Session Theme:	producible, empirical, critical, logical of probability theory, rcher in terms of; riosity, Positivity of	At the end of the session students should be able to - Explain meanings of various characteristics of health research process so as to be able to differentiate research activity from non-research activity. - Interpret certain ingredients of the researcher - Explain the importance of comprehending certain pre-requisite competencies (knowledge & skills) before undertaking a research study.	-1week prior to teaching session students are provided copy of purposely selected research articles for prior readings -LGIS 2 parallel classes spanning over a period of 60-90min Each session conducted by Senior faculty	T MC/S OF Tevel CT to C3

	capacities including medical statistics & probability theory, study			
	designs, sampling techniques & sample size calculation, &			
	hypothesis testing, required to undertake research.			
Conta	act session-III. Session Theme: Students are introduced towards ger	neral principles of ethics in research so they could perc	eive basic ethical needs of the health research	
Sess	Session course outlines	Learning outcomes	Teaching strategy	Assessme
ion				nt tools
title				
S	Discussion on Health Research ethics including;	At the end of the session students should be able to;	- 1 week earlier students will guided for specific	<u> </u>
asi	- Background, Nuremburg code and importance of ethics in	- Recognize value of ethics in conduct of Health	readings through WBO.	MCQs
B	health research	Research.	- LGIS	C
nics	- General ethical principles of HR including explanation of 06	- Relate principles of research ethics with a	2 parallel classes spanning over a period of 60-)s (
Eth	basic principles: autonomy, beneficence, non-maleficence,	research in real world.	90min.	of 1
ch:	respect &justice and truthfulness.	- Interpret method & explains value informed	Each session conducted by Senior faculty	ev
ar	- Value of Informed consent and confidentiality in health	consent and confidentiality in HR.	Each session conducted by Schol faculty	of level C
ese	research involving human subjects.	- Justify ethics of health research methods*		<u> </u>
l R	- Ethics in research methods*			to
altk		- Tell responsibility for ethics in HR.		\mathbb{C}
Health Research Ethics Basic	- Responsibility for ethics in HR	- Explain Process of IRB.		
	- Intro to working of Institutional review board			
-	act session-IV. Time: 60-90 min			
	on Theme:			
	ents are introduced to basic elements of health research proposal writers			
	rch thinking or for undertaking a small research project in future year		in "abstract or full text purposely selected article of a	n original
publi	c health research (cross-sectional study) article published in some st	andard medical journal.		
Sess	Session course outlines	Learning outcomes	Teaching strategy	Assessme
ion				nt tools
title				
	Considering elements of article under discussion, teachings will	At the end of the session students should be able to	1week prior to session-IV, students are	
ntc sal	cover basic elements of Health research Proposal (HPP) writing	:	communicated through WBO to read at least one	
======================================	focusing;	- Clarify means and criterion used for selecting a	original full text research article preferably a	<u> </u>
research idea into	- Sources of research ideas	topic for research	cross-sectional study under precise guidelines	MC
- ch		- Explain purpose and sources of update	tailored to the need of contact session IV.	CQs
research	- Literature review & making citations-	information on topic	SGID: 4 Parallel sessions are held under uniform	
res	(Purpose, method, Sources & ethics)	- Narrate elements of introduction	teaching guidelines.	ev
_ g _		- Explain purpose of statement of objectives	teaching guidennes.	el (
Translating a workable	- 0-1 arts of infoduction (background,			(level C1-C3
 lati rka	update literature, rationale and expected utility)	- Narrate necessary components of methodology		Ü
nns No	- Constructing Statement of objectives	section and appreciate value of each.		3)
rs	- Elements of Methodology Section, (emphasizing data	- Explain parts of questionnaire and types of questions used.		
E E				

		study objectives & variables etc)		
Suggest	I. II. III. IV. V.	Text Book of Public Health & Community Medicine by Mul Short Book of 'Research Methodology and Biostatistics" by WHO: Eastern Mediterranean Region. A Practical Guide for USMLE- High Yield Biostatistics. https://www.who.int/ethics/research/en/	Prof.Sira Afzal	

Innovation & 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.

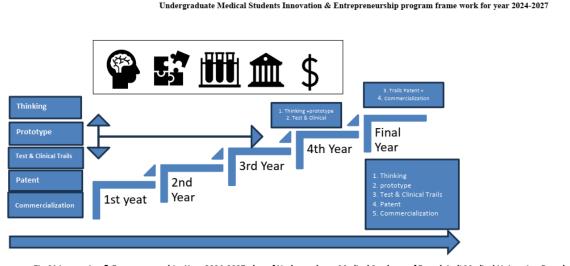
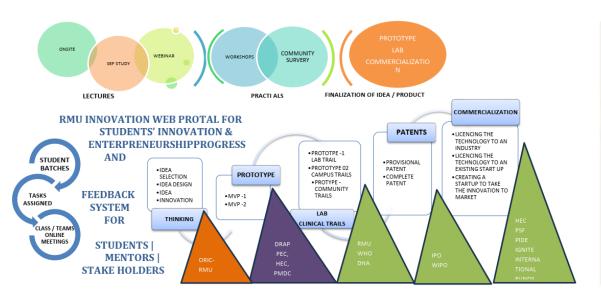


Fig:01 Innovation & Entrepreneurship; Year 2024-2027 plan of Undergraduate Medical Students of Rawalpindi Medical University, Rawalpindi

Class / Activity	Innovation / Physical Lecture Groups formation	Ideas Presentations Webinars	Protype Physical lecture Groups	Test & Clinical Trails	Patent	Commercialization
1st Year						
2 nd Year						
3 rd Year	_					
4 th Year						
Final Year						





Year 01 to year 5th Sequence of academic Activities

		1st year	2 nd Year	3 rd year	4th Year	Final Year	
Physical	Feb	Innovation / Lecture	Thinking	Protype * Blueprint Prototype Prototype	Test & Clinical Trails Patent	Commercialization	Start UP With Start UP Industry
Webinar	Marh	Groups formation	Innovation Idea designing	Introduction to basic medical equipment and devices. Participating in simple prototyping exercises to understand design principles.			
SDL	April		50				0
Webinar	May		Idea presentations				5
Physical	June		Idea maturation Pitch Idea final approval				
Group Task	August		Final selection Idea for MVP - 1& II & Seed Grant			Grant Submission Applied in exhibitions	

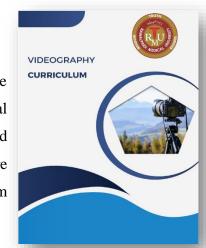
YEARLY ACTIVITIES FOR A MEDICAL STUDENT FOCUSING ON IDEAS GENERATION, PROTOTYPING, TESTING, CLINICAL TRIALS, PATENTING, AND COMMERCIALIZATION:

First Year:

- 1. **Ideas:**
- Brainstorming sessions to generate ideas for medical innovations or research projects.
- Exploring basic medical concepts and identifying areas for improvement or innovation.
- 2. **Prototype:**
 - Introduction to basic medical equipment and devices.
 - Participating in simple prototyping exercises to understand design principles.
- 3. **Test & Clinical Trials:**
 - Observing basic clinical procedures to understand testing protocols.
- Learning about the importance of evidence-based medicine through case studies.
- 4. **Patent:**
 - Introduction to intellectual property rights and patenting process.
 - Understanding the significance of patenting in protecting medical innovations.
- 5. **Commercialization:**
 - Introduction to medical entrepreneurship and commercialization.
 - Exploring the process of bringing medical products to market.

Videography Curriculum

In an age where visual communication and digital media play pivotal roles in healthcare education, research dissemination, and public outreach, the importance of videography as a skill cannot be overstated. This comprehensive course at Rawalpindi Medical University is designed to equip students with the essential knowledge, technical proficiency, and creative acumen necessary to excel in utilizing video as a powerful tool in the medical field. Spanning four years and totaling 24 hours of instruction, this course integrates theoretical foundations with hands-on practical experience tailored to the unique needs of future healthcare professionals. Through interactive lectures, immersive workshops, and project-based assessments, students will embark on a transformative journey from mastering fundamental camera operations and lighting techniques to refining advanced video editing skills and project management capabilities.



First Year MBBS Introduction to Videography (6 hours)

Sr No.	Topic	Learning Objectives	Teaching Strategy	Assessment Tool
1.	Fundamentals of	Understand the historical context and evolution of videography.		
	Videography	Identify different types of cameras and their primary uses.	LGIS	MCQs
2.	Camera Operation Basics	Learn essential camera settings such as exposure, focus, and white balance.		
		Practice basic camera movements and their effects on shot composition.	LGIS	MCQs
3.	Shot Composition	Master framing and composition principles for effective storytelling.		
	Techniques	Analyze how different camera angles influence viewer perception.	LGIS	MCQs
4.		Understand the importance of lighting in videography.		
	Introduction to Lighting	Identify basic lighting equipment and their functions.	LGIS	MCQs
5.	Ethical Considerations in	Explore ethical dilemmas related to privacy, consent, and representation in		
	Media Production	media.	LGIS	MCQs
		Understand the responsibility of videographers in creating ethical content.		
6.		Apply knowledge gained to plan and shoot a short video project.		
	Basic Video Production	Demonstrate competency in basic camera operations and shot composition.	LGIS	MCQs



Early Clinical Exposure (ECE)



Early Clinical Exposure (ECE)

Introduction

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.: Earl



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.

Vision

- 1. To create a seamless integration of theoretical knowledge and clinical skills, where students can apply classroom lessons in real-world healthcare settings from the start of their education. This approach aims to break down the traditional barriers between preclinical and clinical phases of medical training.
- 2. To shape well-rounded healthcare professionals who are not only clinically competent but also empathetic, ethical, and communicative. It emphasizes the development of soft skills, such as empathy, teamwork, and patient communication, alongside hard clinical skills.
- 3. To foster a culture of innovation and adaptability in future healthcare professionals. As medicine is a rapidly evolving field, students should be prepared to continually update their knowledge and adapt to new technologies and treatments.
- 4. To instill a strong foundation in patient-centered care, where students learn to put the needs and values of patients at the forefront of their clinical decision-making process.
- 5. Encouraging students to develop their professional identity from the outset of their training, helping them to understand and embody the roles, responsibilities, and ethical standards of the medical profession.
- 6. To promote understanding and collaboration among different healthcare disciplines, recognizing that modern healthcare is a team effort requiring coordinated multi-disciplinary approaches.
- 7. Encouraging an inclination towards scientific inquiry and research, integrating research skills early in the module to foster a mindset of evidence-based practice.

8. To equip students with a global perspective on health, understanding both local and international health challenges, and preparing them for a career in an increasingly interconnected world.

Mission

The mission of the early clinical module is to profoundly transform medical education by integrating clinical experiences from the very beginning. This approach aims to enrich the learning process, making it more relevant and engaging by immediately applying theoretical knowledge to real-world clinical settings. It focuses on developing essential clinical skills, fostering empathy, and ensuring patient-centered care.

The module is designed to nurture a strong professional identity and ethical grounding in students, preparing them for the realities of a career in medicine. It encourages adaptability, resilience, and a commitment to lifelong learning in the face of the ever-evolving field of healthcare. By exposing students to a variety of medical specialties and healthcare environments early on, it also aids them in making more informed career choices. Overall, this module seeks to produce well-rounded, competent, and compassionate healthcare professionals ready to meet the challenges of modern medicine.



Aim and Objectives

- 1. To provide students with the opportunity to start developing essential clinical skills, such as basic patient examination, history taking, and simple procedural skills.
- 2. To bridge the gap between theoretical knowledge and its practical application. This helps students understand how their preclinical learning is relevant to clinical settings.
- 3. To instill a sense of professionalism and an understanding of medical ethics from the very beginning of medical training. This includes aspects such as patient confidentiality, empathy, and communication skills.
- 4. To emphasize the importance of patient-centered care, helping students understand the patient's perspective, and the impact of illness on patients and their families.
- 5. To introduce students to the workings of the healthcare system, including the roles of various healthcare professionals and the challenges faced in delivering effective care.
- 6. To encourage students to engage in reflective practice and self-assessment, fostering a habit of lifelong learning and continuous improvement in their professional skills.
- 7. To expose students to the multidisciplinary nature of healthcare, teaching them the value of teamwork and collaboration with other healthcare professionals.
- 8. To provide exposure to a range of clinical environments, such as hospitals, primary care clinics, and community health centers, to give students a broader understanding of different aspects of healthcare.
- 9. To allow students to explore various medical specialties early in their education, aiding in informed career decision-making later on.



- 10. To help students build confidence in their clinical abilities and reduce the anxiety associated with transitioning from theoretical learning to clinical practice.
- 11. To cultivate empathy and compassion towards patients, which are key components of effective patient care.
- 12. To encourage the development of critical thinking and problem-solving skills essential for clinical practice.

Outcomes

- 1. Early clinical experiences can help students understand the clinical relevance of the basic sciences they are studying. This integration of theoretical knowledge with practical application can deepen their understanding and retention of key concepts.
- 2. Engaging with patients and healthcare professionals early in their training helps students develop effective communication skills, which are crucial for patient care and interprofessional collaboration.
- 3. Students get an opportunity to start developing essential clinical skills, such as history taking, physical examination, and clinical reasoning, from the beginning of their medical education.
- 4. Early clinical exposure can increase students' motivation and interest in their studies by providing a clear context for the relevance of their coursework to their future roles as doctors.
- 5. Interacting with patients and healthcare teams early in their training can aid students in forming their professional identity and understanding the roles and responsibilities of being a physician.
- . Exposure to real-world clinical scenarios can help students develop critical thinking and decision-making skills.
- 7. Students begin to encounter and learn to manage the emotional and ethical challenges inherent in medical practice earlier, which can prepare them for the realities of their profession.
- 8. Exposure to various medical specialties and settings can aid students in making informed decisions about their future career paths.
- 9. Long-term, students trained with early clinical exposure may develop into more competent and empathetic physicians, potentially leading to better patient outcomes.
- 10. Engaging in clinical settings early can spark an interest in clinical research, leading to contributions in medical science.



1st Year MBBS ECE Curriculum

S. No	Rotations	Sessions
1	Medicine and Allied	This rotation focuses on providing students with a foundational understanding of internal medicine, emphasizing clinical skills such as history
		taking, physical examination, and diagnosis formulation. It fosters a patient-centered approach to care. Sessions are on,
		History Taking
		General Physical Examination
		Investigations (X-rays, CT scans, MRIs)
		Medical Equipment (Glucometer, Defibrillator)
2	Surgery and Allied	Introducing basic surgical principles and patient management, this rotation covers preoperative, postoperative care, and the importance of
		informed consent and patient privacy. Sessions are on,
		History Taking
		General Physical Examination
		Informed Consent and Patient Privacy
		Preoperative & Postoperative Care
3	Emergency	The Emergency Department rotation exposes students to fast-paced, critical patient care environments, focusing on triage, monitoring vitals,
		and emergency procedures. Sessions are on,
		Introduction to Triage System
		Setting IV Drips and IM Injections
		Insertion of Foley Catheter
		Nebulization Procedures
4	Radiology	This rotation introduces students to diagnostic imaging, focusing on reading X-rays and other imaging modalities critical for patient diagnosis.
		Sessions are on,
		How to Read Bone X-rays
		Bone Age Assessment
		Fractures of Distal Bones
5	Gynae/Obstetrics	The Gynecology/Obstetrics rotation provides students with insight into reproductive health and maternal care, focusing on abnormalities and
		their management. Sessions are on,
		Placental Abnormalities
		Uterine Abnormalities
		Pregnancy and Congenital Uterine Abnormalities

Early Clinical Exposure

Foundation Module

Rotation in Discipline of Medicine and Allied

Premise

The "Medicine and Allied Module" in an early clinical exposure module is a crucial component designed to lay a comprehensive foundation in medicine and its interconnected specialties. A significant focus is placed on the development of practical skills essential for any aspiring physician. This includes history taking, physical examination, interpreting diagnostic tests, and formulating differential diagnoses, all within a real-world clinical setting to enhance learning effectiveness. The module emphasizes a patient-centered approach, teaching students to consider and incorporate the patient's perspective, experiences, and needs in the management process, thereby fostering empathy and enhancing communication skills. Additionally, the module encompasses interprofessional education, encouraging students to engage with and learn from

First Year MBBS Foundation Module				
Discipline of Medicine and Allied 2024				
Session	Learning Objectives		Teaching Strategy	
1 History Taking	At the end of this session, the students after observing senior faculty and interviewing various patients of the ward will be able to record. • Patient profile • Presenting complaints • History of present illness • Systemic inquiry • Relevant patient history • Family history • Socio economic history • Drug history	•	Bedside teaching Duration 1.5 hrs Conducted by senior faculty member of medicine unit	
II General physical Examination	At the end of this session, the student will practice on various patients and will be able to Record vital signs • Blood pressure • Pulse • respiratory rate • Temperature • Do general physical examination	•	Bedside teaching Duration 2 hrs Conducted by senior faculty member of medicine unit	
III Investigations	At the end of this session, the student will be able to identify • X-Rays	•	Bedside teaching Duration 2 hrs Conducted by senior faculty	

	CT Scan		member of medicine unit
	• MRI		
	• ECG		
IV	At the end of this session, the student will be able to do identify	•	Bedside teaching
Medical Equipment/	Glucometer	•	Duration 2 hrs
instruments	Defibrillator	•	Conducted by senior faculty
	Umbo bag		member of medicine unit
	Monitors		
	Oximeters		
	• ECG		

Rotation to Surgery and Allied Module

Premise

The "Surgery and Allied Module" in an early clinical exposure module is strategically designed to introduce medical students to the fundamentals of surgical care and its associated specialties at an early stage in their education. This module aims to lay a strong foundation in understanding basic surgical principles, including wound healing, and the physiological impacts of surgical interventions. Students are also guided through the comprehensive process of patient assessment and management, covering preoperative and postoperative care, which is crucial for understanding the entire surgical journey of a patient.

Ethical and legal considerations specific to surgery, such as informed consent and patient privacy, are integral to the module, ensuring students are well-versed in the complexities of surgical care. Additionally, the module promotes an understanding of the interplay between surgery and other medical disciplines, highlighting the importance of a collaborative approach to patient care.. Overall, this module is tailored to equip students with a comprehensive and practical understanding of surgery, preparing them for future clinical rotations and potential careers in these dynamic and challenging areas of medicine

	Surgery and Allied Module First MBBS 2024			
Session	Learning Objectives	Teaching Strategy		
1 (History Taking)	At the end of this session, the students after interviewing various patients of the ward will be able to record. • Patient profile • Presenting complaints • History of present illness • Systemic inquiry • Relevant medical history • Family history • Socio economic history	 Bedside teaching Duration 1.5 hrs Conducted by senior faculty member of surgical unit 		

• Drug history	
At the end of this session, the student will practice on various patients and will be able to Record vital signs • Blood pressure • Pulse • Respiratory rate • Temperature • Do general physical examination	 Bedside teaching Duration 1.5 hrs Conducted by senior faculty member of surgical unit
 At the end of this session, the student will be able to do To comprehend the ethical and legal foundations of informed consent in healthcare. To recognize the importance of informed consent as a patient right and a key aspect of patient-centered care. To understand the principles of patient privacy and 	Bedside teaching Duration 1 hour Conducted by senior faculty member of surgical unit
 Understand how to conduct a thorough preoperative assessment, including medical history, physical examination, and relevant investigations. Learn to identify and optimize underlying medical conditions that could affect surgical outcomes, such as managing chronic diseases (like diabetes, hypertension) and addressing malnutrition or anemia. To recognize the normal process of healing and recovery after surgical interventions. To assess and manage postoperative pain using appropriate pain scales and interventions. To assess and manage surgical wounds, including dressing changes, monitoring for signs of infection, and 	 Bedside teaching Duration 1 hour Conducted by senior faculty
	At the end of this session, the student will practice on various patients and will be able to Record vital signs Blood pressure Pulse Respiratory rate Temperature Do general physical examination At the end of this session, the student will be able to do To comprehend the ethical and legal foundations of informed consent in healthcare. To recognize the importance of informed consent as a patient right and a key aspect of patient-centered care. To understand the principles of patient privacy and confidentiality as per legal standards Understand how to conduct a thorough preoperative assessment, including medical history, physical examination, and relevant investigations. Learn to identify and optimize underlying medical conditions that could affect surgical outcomes, such as managing chronic diseases (like diabetes, hypertension) and addressing malnutrition or anemia. To recognize the normal process of healing and recovery after surgical interventions. To assess and manage postoperative pain using appropriate pain scales and interventions.

Rotation to Emergency

Premise

The Emergency Department (ED) stands as a unique and vital arena in the landscape of medical education. Recognizing the immense educational value that early clinical exposure holds for medical students, our program has been designed to introduce first year MBBS students to the dynamic and challenging environment of the ED. This initiative is rooted in our commitment to cultivating a new generation of medical professionals who are not only academically proficient but also adept in handling the practical and often unpredictable realities of patient care.

The purpose of this program is to bridge the gap between theoretical knowledge and practical application, thereby enhancing the overall competence and confidence of our future physicians. Exposure to the ED environment aims to provide students with invaluable insights into real-world medical scenarios, fostering critical thinking, decision-making skills, and a deep understanding of patient-centered care.

Emergency Department First MBBS 2024				
Session	Learning Objectives At the end of the session, student will be able to	Teaching Strategy		
I Introduction to ER services regarding triage system & Monitoring of vitals	 Describe principles and protocols of the triage system used in the ED. Categorize patients based on the severity of their conditions, utilizing established triage criteria such as the Emergency Severity Index (ESI). Recognize the importance of prompt and accurate triage to ensure that patients receive care in a timely and efficient manner according to their medical needs. Accurately measure and interpret basic vital signs: heart rate, blood pressure, respiratory rate, temperature, and oxygen saturation. Appreciate the significance of changes in vital signs and how they relate to various medical conditions. Recognize critical values of vital signs that require immediate medical intervention. 	 Bedside teaching Duration 2 HRS Conducted by senior faculty member of surgical unit 		
II Setting of IV drips Observation of IV cannulas IM injections	 Monitor and assess IV cannula sites for signs of infection, infiltration, phlebitis, or other complications. Maintenance of IV cannulas, including changing dressings, flushing the line, and ensuring the patency of the IV line. Identify when an IV cannula needs to be re-sited and the protocol for safe removal of an IV cannula. Demonstrate techniques for administering IM injections, including site selection and needle selection based on patient age and body mass. Prepare medication for IM injection, including calculations for proper dosages. Understand safe administration practices, including aseptic technique, 	 Bedside teaching Duration 1.5 hrs Conducted by senior faculty member of surgical unit 		

	correct needle disposal, and patient aftercare to minimize discomfort and complications. • Recognize and manage any adverse reactions or complications associated with IM injections.	
III Insertion of folleys catheter Nebulization	 Enlist indications and contraindications for Foley's catheter insertion. Practice sterile technique for catheter insertion, including patient preparation, catheter placement, and securing the catheter. Acknowledge patient privacy and comfort, Recognizing and managing potential complications such as infection or injury. Enlist indications for nebulization, including different medications used for nebulization and their purposes. understand the components and operation of a nebulizer machine. Prepare the medication for nebulization, administering the treatment, and monitoring the patient during the procedure. 	 Bedside teaching Duration 1.5 hrs Conducted by senior faculty member of surgical unit

Musculoskeletal- I Module

Class will be divided into 3 batches. There will be 3 days of clinical rotations.

Rotation in Orthopedic Department

Orthopedic Department First MBBS 2024			
Sessions	Learning Objectives	Teaching Strategy	
	At the end of the session ,students will be able to		
I See the fracture case Fracture of Distal bone. Management of Fracture	 Assess and identify different types of fractures, with a specific focus on fractures of distal bones (such as the distal radius, ulna, and phalanges). Understanding the mechanism of injury, Recognizing signs and symptoms of fractures, and conducting a thorough physical examination. interpret radiographic images (X-rays) to confirm the diagnosis of a fracture. Understand management strategies for fractures of distal bones, including both conservative and surgical options. Describe indications for different treatment modalities, such as casting, splinting, or surgical intervention. 	Bedside teaching •Duration 2 hrs •Conducted by senior faculty member of surgical unit	

	 Practice principles of fracture reduction and immobilization techniques. 	
II Complications of malunion.	 Identify malunion and understand its causes, focusing on factors like inadequate fracture reduction and improper immobilization. Recognize the clinical signs of malunion, Understand the range of complications arising from malunion, Manage and treatment options for malunion, encompassing both conservative methods and surgical interventions. Understand prevention strategies for malunion patient education for optimal bone healing and adherence to treatment plans. 	Bedside teaching Duration 1.5 hrs Conducted by senior faculty member of surgical unit
III Rehabilitation (Physiotherapy)	 Practice post-treatment care for fractures, including pain management, wound care, and monitoring for potential complications like infection or delayed healing. Understand the role of physiotherapy and rehabilitation in the recovery process to restore function and prevent stiffness or muscle atrophy. Educate patients about self-care, follow-up appointments, and signs that warrant medical attention during the healing process. 	Bedside teaching •Duration 1.5 hrs Conducted by senior faculty member of surgical unit

Rotation in Radiology Department

Radiology Department			
First MBBS 2024			
Sessions	Learning Objectives	Teaching Strategy	
	At the end of the session, students will be able to		
I How to Read Bone X- ray.	 Describe the principles of X-ray production and how it is used to visualize bones. Understand the differences between various types of X-ray studies (e.g., plain radiographs, CT scans, MRI) and when each is indicated. Review the normal anatomy of various skeletal regions as seen on X-rays, including the spine, pelvis, upper and lower extremities, and skull. Identify key anatomical landmarks that are critical for interpreting bone X-rays. Distinguish between normal anatomical variations and pathological findings. Understand the concept of anatomical variants that may mimic disease. Learn to identify common pathologies visible on bone X-rays, such as fractures, dislocations, degenerative changes, and bone lesions. 	Bedside teaching •Duration 2 hrs •Conducted by senior faculty member of surgical unit	

	Recognize artifacts and common pitfalls in image interpretation.	
II How to find Bone age	 Explain the significance of bone age and its role in assessing the growth and development of children. Understand the differences between chronological age and bone age and why bone age can be a better indicator of maturation in certain contexts. Review normal skeletal anatomy and development, including the process of ossification and the timing of appearance and fusion of growth plates. Understand the variations in bone development due to sex, genetic factors, and environmental influences. Learn about the different methods and standards for assessing bone age, including the Greulich-Pyle and Tanner-Whitehouse methods. Practice identifying and evaluating specific radiographic landmarks used in bone age assessment. 	•Bedside teaching •Duration 1.5 hrs •Conducted by senior faculty member of surgical unit
	 Discuss the ethical considerations in ordering radiographs for the purpose of bone age assessment, including issues related to radiation exposure. 	
III Fractures of distal Bones	 Review the anatomy of distal bones, including the distal radius, ulna, femur, tibia, fibula, and the bones of the hand and foot. Understand the biomechanical functions of these bones and how they contribute to the mobility and stability of joints. Discuss how different mechanisms of injury can affect fracture patterns and treatment approaches. Learn to interpret radiographic findings and other diagnostic imaging modalities used in the evaluation of distal bone fractures. Discuss the general principles of fracture management, including the importance of achieving and maintaining reduction, ensuring stable fixation, and preventing complications. Learn about the various treatment options for distal bone fractures Discuss the role of physical therapy and rehabilitation in the recovery process following distal bone fractures. 	Bedside teaching •Duration 1.5 hrs Conducted by senior faculty member of surgical unit

Rotation to Gynae/Obstetrics Department

Discipline of Gynae/Obs First MBBS 2024		
Sessions	Learning Objectives	Teaching Strategy
	At the end of the session, students will be able to	
I Placental abnormalities	 Review normal placental anatomy, structure, and function, and physiological changes across trimesters. Classify different types of placental abnormalities, including placenta previa, placental abruption, placenta accreta spectrum disorders, and placental insufficiency. Understand risk factors, epidemiology, and potential outcomes of various placental abnormalities. Learn diagnostic techniques, including prenatal screening and imaging methods like ultrasound and MRI, for identifying placental abnormalities. Discuss management options for placental abnormalities, considering maternal and fetal well-being and the timing of delivery. Identify potential complications for the mother and fetus associated with placental abnormalities, including hemorrhage and fetal growth restriction. Develop effective communication strategies for discussing diagnosis, management plans, and potential outcomes with patients and their families Explore current research, emerging technologies, and innovative treatments in the diagnosis and management of placental abnormalities. 	Bedside teaching •Duration 2 hrs •Conducted by senior faculty member of surgical unit
II Uterine abnormalities	 Review the normal anatomy and physiology of the uterus to establish a baseline for understanding abnormalities. Classify uterine abnormalities, including congenital anomalies (such as Müllerian duct anomalies), fibroids, adenomyosis, polyps, and uterine scarring (Asherman's syndrome). Describe the impact of uterine abnormalities on fertility, pregnancy outcomes, and gynecological health. Understand the diagnostic techniques for identifying uterine abnormalities, including ultrasound, hysteroscopy, MRI, and saline infusion sonography. Discuss the clinical implications of various uterine abnormalities, focusing on symptomatology and potential complications. Assess the impact of uterine abnormalities on reproductive techniques, including assisted reproductive technologies (ART) and the approach to 	Bedside teaching •Duration 1.5 hrs •Conducted by senior faculty member of surgical unit

	 patients desiring fertility. Discuss strategies for counseling patients with uterine abnormalities, including discussing fertility implications, treatment options, and long-term prognosis. Explore current research and emerging trends in the diagnosis and management of uterine abnormalities to stay updated on advances in gynecological care. Understand the types of congenital abnormalities that can affect pregnancy outcomes, including chromosomal, structural, and genetic disorders. Learn how to use prenatal screening and diagnostic tools, such as ultrasound, 	
III Pregnancy and effects of congenital uterine abnormalities	 amniocentesis, and cell-free DNA testing, to detect congenital abnormalities early in pregnancy. Discuss the impact of identified congenital abnormalities on pregnancy management, including considerations for continued pregnancy, intervention options, and planning for delivery. Explore counseling strategies for parents facing a diagnosis of congenital abnormalities, focusing on communication of risks, outcomes, and support resources. Review the latest research and guidelines on the prevention and management of congenital abnormalities during pregnancy to inform evidence 	•Duration 1.5 hrs Conducted by senior faculty member of surgical unit

Rotation to Pediatrics Department

Pediatrics Department First MBBS 2024			
Sessions	Learning Objectives	Teaching Strategy	
	At the end of the session, students will be able to		
I X-ray in pediatric age group	 Understand the principles of X-ray imaging and radiation safety specifically tailored to the pediatric age group, emphasizing the "As Low As Reasonably Achievable" (ALARA) principle for minimizing radiation exposure. Review the normal anatomical and developmental variations in the pediatric population that impact the interpretation of X-ray images, including the appearance of growth plates, ossification centers, and the variability with age. Learn to identify common pediatric-specific conditions visible on X-ray, such as developmental dysplasia of the hip, Legg-Calvé-Perthes disease, and slipped capital femoral epiphysis, along with common fractures and their 	Bedside teaching •Duration 2 hrs •Conducted by senior faculty member of surgical unit	

II Pathologies like Rickets, congenital dislocation of hip joint and other abnormalities	 Develop a systematic approach to reviewing pediatric X-rays, incorporating a checklist to ensure all aspects of the image are analyzed thoroughly and accurately. Discuss the indications for X-ray in the pediatric population, including the clinical scenarios where X-ray is preferred and how to effectively communicate the need for imaging to parents and caregivers. Understand the etiology and pathophysiology of metabolic bone diseases such as Rickets and Osteomalacia, including the roles of vitamin D, calcium, and phosphate metabolism. Learn to identify the clinical features and diagnostic criteria for Rickets and Osteomalacia, focusing on both biochemical markers and characteristic findings on physical examination and imaging studies. Review the management strategies for Rickets and Osteomalacia, including dietary modification, supplementation, and the role of UV exposure, as well as monitoring for treatment efficacy and potential complications. Understand the developmental and anatomical aspects of congenital dislocation of the hip joint, including risk factors, screening methods, and the importance of early detection. Learn the principles of management for congenital dislocation of the hip, including the use of harnesses, casting, and surgical options, and the outcomes associated with early versus late treatment. Discuss other common pediatric skeletal abnormalities, such as clubfoot, scoliosis, and limb length discrepancies, including their diagnosis, treatment options, and long-term management considerations. 	Bedside teaching •Duration 1.5 hrs •Conducted by senior faculty member of surgical unit
	scoliosis, and limb length discrepancies, including their diagnosis, treatment	

Musculoskeletal - II Module

Class will be divided into 3 batches. There will be 3 days of clinical rotations

Rotation in Medicine and Allied

Medicine and Allied Department First MBBS 2024		
Sessions	Learning Objectives	Teaching Strategy
	At the end of the session, students will be able to	
I Cases of myopathies/ muscular dystrophy/	 Discuss pathophysiological mechanisms behind myopathies and muscular dystrophies Develop skills to identify the clinical features and diagnostic criteria of myopathies and muscular dystrophies Understand current treatment options and management strategies for myopathies and muscular dystrophies. Engage with the latest research and explore future directions in the treatment of muscle disease 	Bedside teaching •Duration 2 hrs •Conducted by senior faculty member of surgical unit
II Polymyositis/Muscle atrophy	 Learn the basic causes of polymyositis and muscle atrophy, focusing on how inflammation and lack of use can lead to muscle weakness and loss. Recognize common symptoms of both conditions and understand the simple steps doctors use to diagnose them, such as checking for muscle weakness and using basic tests. Explore the main treatments available, including simple medications and therapies that can help reduce symptoms and improve muscle strength. Understand the role of teamwork in care, emphasizing how doctors, therapists, and patients work together to manage these conditions and improve health. Discover the impact of exercise and nutrition on managing and potentially improving conditions like polymyositis and muscle atrophy, highlighting the benefits of specific types of physical activity and dietary choices. Learn about the patient's experience with polymyositis and muscle atrophy, including how these conditions can affect daily life and the importance of support and adaptation strategies. Introduce the concept of ongoing research in the field of muscle diseases, encouraging curiosity about how future discoveries might lead to new treatments for polymyositis and muscle atrophy. 	• Bedside teaching • Duration 1.5 hrs • Conducted by senior faculty member of surgical unit
	 Understand the significance of enzyme level variations in diagnosing muscle damage, learning how increases or decreases in specific enzymes can indicate 	Bedside teaching •Duration 1.5 hrs

	different types of muscle conditions.	•Conducted by senior
III	• Identify common muscle enzymes tested in clinical practice, such as creatine kinase	faculty member of
Muscle enzyme interpretation	(CK), aldolase, AST, and ALT, and understand what high levels of each might	surgical unit
	suggest about muscle health.	
	Explore case studies or examples where muscle enzyme interpretation played a key	
	role in diagnosing and managing muscle disorders, to contextualize theoretical	
	knowledge and enhance problem-solving skills.	

Rotation to Surgery and Allied

	Surgery and Allied Department		
First MBBS 2024			
Sessions	Learning Objectives	Teaching Strategy	
	At the end of the session, students will be able to		
I Burns and Plastic Surgery	 Identify and classify burns based on their depth, extent, and severity, understanding the specific challenges presented by burns in critical areas such as the face, hands, and over major joints. Describe the initial assessment and management steps for burn patients, emphasizing the importance of securing the airway, supporting breathing and circulation, accurately estimating the extent of burns for fluid resuscitation, and recognizing when to refer to specialized care. Understand the principles of wound care in burn patients, including the appropriate use of cleaning, debridement, topical antimicrobials, and dressing choices to promote healing and prevent infection. Gain knowledge of the surgical interventions used in the treatment of burns, including the indications for and techniques of skin grafting, and the role of plastic surgery in the reconstruction of post-burn deformities to restore function and appearance. Recognize the psychological impact of burn injuries on patients and the importance of 	Bedside teaching •Duration 2 hrs •Conducted by senior faculty member of surgical unit	
	integrating psychological support and rehabilitation services into the care plan to address the physical, emotional, and social aspects of recovery.		
II Management of superficial and	 Distinguish between superficial and deep burns based on their characteristics and clinical presentations, understanding the differences in pathophysiology, potential 	Bedside teaching	
deep burns	complications, and healing outcomes.	•Duration 1.5 hrs	
	 Describe the principles of initial management for burn injuries, including immediate first aid measures, pain management strategies, and criteria for hospital referral, with an emphasis on the unique approaches required for superficial versus deep burns. 	•Conducted by senior faculty member of	

Evaloin fluid magazitation attacts aign for door hours injuried including the coloulation of	surgical unit
• Explain fluid resuscitation strategies for deep burn injuries, including the calculation of	surgical unit
fluid requirements using formulas such as the Parkland formula, and monitoring of fluid	
balance to prevent both under-resuscitation and fluid overload.	
 Identify the indications for and methods of wound care in both superficial and deep 	
burns, covering cleaning, debridement, the use of topical antimicrobial agents, and the	
selection and application of appropriate dressings.	
• Understand the role of surgical intervention in the management of deep burns, including	
the timing and types of surgical debridement, skin grafting techniques, and the	
principles of reconstructive surgery for the restoration of function and appearance.	
• Recognize the importance of multidisciplinary care in the management of burn patients,	
including the need for nutritional support, physical and occupational therapy,	
psychological support, and long-term rehabilitation to optimize recovery and quality of	
life.	
 Counseling of burn patient and family 	

Rotation to Radiology Department

Radiology Department			
First MBBS 2024			
Sessions	Learning Objectives	Teaching Strategy	
	At the end of the session, students will be able to		
	• Describe the anatomy of the hip bone and joint, highlighting the pelvis, femur, acetabulum,	Bedside teaching	
	 and their articulations, along with the identification of bony landmarks visible on an X-ray. Discuss basic principles of radiography relevant to the hip, including the production of X- 	•Duration 2 hrs	
I	rays, the significance of anteroposterior and lateral views, and how these principles assist in visualizing hip anatomy.	•Conducted by senior faculty	
X-Ray of Hip Bone and Hip Joint	• Identify and describe the normal radiographic anatomy of the hip joint, recognizing the	member of surgical	
	appearance of hip bones, joint spaces, and associated soft tissues on X-rays.	unit	
	• Recognize basic pathological findings on hip X-rays, such as fractures, developmental abnormalities, degenerative changes, and signs of infection.		
	• Emphasize the importance of safety measures in radiography, including the use of protective		
	equipment and minimizing radiation exposure, alongside ethical considerations in the ordering and interpretation of radiographic examinations.		

		T .
II X ray of pelvis,	 Describe the anatomy of the hip bone and joint, highlighting the pelvis, femur, acetabulum, and their articulations, along with the identification of bony landmarks visible on an X-ray. Elaborate basic principles of radiography relevant to the hip, including the production of X-rays, the significance of anteroposterior and lateral views, and how these principles assist in visualizing hip anatomy. Identify and describe the normal radiographic anatomy of the hip joint, recognizing the appearance of hip bones, joint spaces, and associated soft tissues on X-rays. Recognize basic pathological findings on hip X-rays, such as fractures, developmental abnormalities, degenerative changes, and signs of infection. understand the importance of safety measures in radiography, including the use of protective equipment and minimizing radiation exposure, alongside ethical considerations in the ordering and interpretation of radiographic examinations. 	Bedside teaching •Duration 1.5 hrs •Conducted by senior faculty member of surgical unit
III X ray of long Bones	 Introduce the anatomy of the hip bone and joint, highlighting the pelvis, femur, acetabulum, and their articulations, along with the identification of bony landmarks visible on an X-ray. Cover the basic principles of radiography relevant to the hip, including the production of X-rays, the significance of anteroposterior and lateral views, and how these principles assist in visualizing hip anatomy. Equip students with the ability to identify and describe the normal radiographic anatomy of the hip joint, recognizing the appearance of hip bones, joint spaces, and associated soft tissues on X-rays. Provide an introduction to recognizing basic pathological findings on hip X-rays, such as fractures, developmental abnormalities, degenerative changes, and signs of infection. Emphasize the importance of safety measures in radiography, including the use of protective equipment and minimizing radiation exposure, alongside ethical considerations in the ordering and interpretation of radiographic examinations. 	Bedside teaching •Duration 1.5 hrs •Conducted by senior faculty member of surgical unit

Blood and Immunity Module

Class will be divided into 3 batches. There will be 3 days of clinical rotations.

Rotation in Medicine and Allied

	Medicine and Allied First MBBS 2024	
Sessions	Learning Objectives	Teaching Strategy
	At the end of the session, students will be able to	
	Describe immune system's structure and function, including distinctions between innate and adaptive immunity and the roles of different immune cells.	
I Immunodeficiency cases	 Develop the ability to identify signs and symptoms indicative of immunodeficiency, such as frequent infections, slow growth in children, autoimmune disorders, and increased risk of opportunistic infections. 	
	 Appreciate broad spectrum of immunodeficiency disorders, encompassing both primary (genetic) and secondary (acquired from external factors) causes. 	Bedside teaching
	• Discuss the general management strategies for immunodeficiency, highlighting the importance of prophylactic measures, targeted therapies like immunoglobulin replacement, and advanced treatments such as stem cell transplantation.	•Duration 2 hrs •Conducted by
	 Develop communication skills, particularly in conveying complex medical information in a clear and compassionate manner, discussing treatment plans, and supporting patients and their families emotionally. 	senior faculty member of surgical unit
	Demonstrate professionalism in patient care, emphasizing respect for patient confidentiality, empathy, and maintaining an unbiased approach to treatment.	
	 Address ethical considerations in managing chronic conditions, including informed consent, autonomy in treatment decisions, and weighing the benefits and risks of therapeutic interventions. 	
	 Develop a foundational understanding of the anatomy and physiology of the liver and spleen, emphasizing their roles in the body's immune response, metabolism, and filtration of blood. 	

II Hepatosplenomegaly	 including but not limited to abdominal distension, discomfort, and signs of underlying systemic diseases. Understand the common causes of hepatosplenomegaly, such as infectious diseases (e.g., viral hepatitis, malaria), hematologic disorders (e.g., leukemia, lymphoma), metabolic and storage diseases (e.g., Gaucher's disease, amyloidosis), and liver diseases (e.g., cirrhosis, fatty liver diseases). Acquire skills in the physical examination of patients with hepatosplenomegaly, including techniques for palpating the liver and spleen, assessing liver size and spleen consistency, and identifying associated signs (e.g., ascites, jaundice). Familiarize with the diagnostic approach to hepatosplenomegaly, including the use of laboratory tests (e.g., liver function tests, complete blood count) and imaging studies (e.g., ultrasound, CT scan) to identify the underlying cause. Gain insights into the basic management principles for patients with hepatosplenomegaly, understanding that treatment varies widely based on the underlying diagnosis and may include addressing infections, managing chronic diseases, or supportive care. Enhance communication skills to effectively discuss findings, diagnoses, and management plans with patients and their families, providing clear explanations and compassionate support. Observe and practice professionalism in patient interactions, demonstrating respect, confidentiality, and empathy, while also being mindful of cultural and individual differences. Appreciate the importance of a multidisciplinary approach in the management of hepatosplenomegaly, recognizing the roles of various specialists such as hepatologists, hematologists, infectious disease experts, and primary care physicians. Encourage self-reflection on the learning experiences at the bedside, identifying personal areas of strength and opportunities for growth in clinical skills, knowledge application, and professional behaviors. 	Bedside teaching •Duration 1.5 hrs •Conducted by senior faculty member of surgical unit
III Lymphadenopathy	 Develop a foundational understanding of the anatomy and physiology of the liver and spleen, emphasizing their roles in the body's immune response, metabolism, and filtration of blood. Learn to recognize the clinical signs and symptoms associated with hepatosplenomegaly, including but not limited to abdominal distension, discomfort, and signs of underlying systemic diseases. Understand the common causes of hepatosplenomegaly, such as infectious diseases (e.g., viral hepatitis, malaria), hematologic disorders (e.g., leukemia, lymphoma), metabolic and storage diseases (e.g., Gaucher's disease, amyloidosis), and liver diseases (e.g., cirrhosis, fatty liver disease). 	Bedside teaching •Duration 1.5 hrs •Conducted by senior faculty member of surgical unit

techniques for palpating the liver and spleen, assessing liver size and spleen consistency, and identifying associated signs (e.g., ascites, jaundice).	
• Familiarize with the diagnostic approach to hepatosplenomegaly, including the use of laboratory tests (e.g., liver function tests, complete blood count) and imaging studies (e.g.,	
ultrasound, CT scan) to identify the underlying cause.	
• Gain insights into the basic management principles for patients with hepatosplenomegaly, understanding that treatment varies widely based on the underlying diagnosis and may	
include addressing infections, managing chronic diseases, or supportive care.	
 Enhance communication skills to effectively discuss findings, diagnoses, and management plans with patients and their families, providing clear explanations and compassionate support. 	
 Observe and practice professionalism in patient interactions, demonstrating respect, confidentiality, and empathy, while also being mindful of cultural and individual differences. 	

Rotation in Pediatrics

	Pediatrics First MBBS 2024	
Sessions	Learning Objectives	Teaching Strategy
	At the end of the session, students will be able to	
I Neonatal Jaundice	 Understand the physiological and pathological mechanisms underlying newborn jaundice, distinguishing between conditions like physiological jaundice, which is common and usually harmless, and pathological jaundice, which can indicate serious underlying diseases. Learn to recognize the clinical signs and symptoms of jaundice in newborns, including the yellowing of the skin and eyes, and understand the significance of the timing of jaundice onset in diagnosing its underlying cause. Enlist the different causes of neonatal jaundice, including hemolytic diseases, infection, metabolic disorders, and breast milk jaundice, along with the importance of identifying risk factors in the prenatal and perinatal history. Develop skills in assessing jaundice using physical examination techniques, such as the Kramer's rule, and understand the role of transcutaneous bilirubinometer as a non-invasive method for estimating bilirubin levels. Acquire knowledge on the diagnostic approach to neonatal jaundice, including the use of serum bilirubin levels to determine the severity of jaundice and the need for further investigations to identify its cause. Understand the principles of managing neonatal jaundice, including phototherapy, exchange 	Bedside teaching •Duration 2 hrs •Conducted by senior faculty member of surgical unit

	 transfusion, and the management of underlying conditions, while considering the potential complications of untreated severe jaundice, such as kernicterus. Enhance communication skills in discussing the findings and management plan with parents or caregivers, providing clear explanations about the condition, its potential implications, and the rationale behind treatment choices. 	
II ABO/ Rh Incompatibility	 Grasp the basic immunological concepts related to ABO and Rh blood group systems, including the antigens and antibodies involved, and how maternal-fetal blood group incompatibility can lead to hemolytic disease of the newborn (HDN). Learn to identify the clinical signs and symptoms of HDN resulting from ABO/Rh incompatibility, such as jaundice within the first 24 hours of life, anemia, and hepatosplenomegaly. Understand the importance of prenatal screening for blood group antigens and antibodies in preventing and managing HDN, including the administration of Rh immunoglobulin to Rhnegative mothers. Become familiar with the diagnostic approach to HDN, including the direct Coombs test, which indicates the presence of antibodies attached to the newborn's red blood cells, and the importance of blood typing and antibody screening. Acquire knowledge on the management strategies for HDN due to ABO/Rh incompatibility, including phototherapy for jaundice, intravenous immunoglobulin (IVIG) therapy, and exchange transfusion in severe cases. Enhance communication skills for effectively discussing the condition, its implications, and the management plan with the parents or caregivers, ensuring they understand the rationale behind treatment options and the importance of follow-up care. Practice professionalism and empathy in the care of newborns and their families, demonstrating respect for their concerns and providing support during the diagnostic and treatment processes 	Bedside teaching •Duration 1.5 hrs •Conducted by senior faculty member of surgical unit
III Lymphadenopathy/ Hepatosplenomegaly	 Develop a foundational understanding of the anatomy and physiology of the lymphatic system and the liver and spleen, highlighting the clinical significance of lymphadenopathy and hepatosplenomegaly. Learn to recognize the signs and symptoms associated with lymphadenopathy and hepatosplenomegaly, including the palpation techniques for detecting enlarged lymph nodes and liver or spleen. Understand the wide range of etiologies behind lymphadenopathy and hepatosplenomegaly, including infectious, neoplastic, autoimmune, and metabolic causes. Acquire skills in conducting a focused history and physical examination tailored to elucidate the underlying cause of lymphadenopathy and hepatosplenomegaly, incorporating relevant diagnostic tests such as blood tests, imaging studies, and biopsy when indicated. Elaborate general management principles for lymphadenopathy and hepatosplenomegaly, appreciating the need for targeted treatment based on the underlying diagnosis and the 	•Duration 1.5 hrs •Conducted by senior faculty member of surgical unit

 importance of monitoring for potential complications. Enhance communication skills to effectively convey findings, diagnostic plans, and management strategies to patients and their families, fostering an environment of empathy 	
and understanding.	

Rotation to Pathology Laboratory

Pediatrics First MBBS 2024		
Sessions	Learning Objectives	Teaching Strategy
	At the end of the session ,students will be able to	
I Identification of Slides of Spherocytosis Microcytosis Leukocytosis Lymph node Bone Marrow	 Visually identify and differentiate between spherocytosis (characterized by spherical red blood cells), microcytosis (presence of smaller than normal red blood cells), and leukocytosis (increased white blood cell count) on blood smear slides. understand of the clinical implications and underlying conditions associated with spherocytosis, such as hereditary spherocytosis, microcytosis, often seen in iron deficiency anemia or thalassemia, and leukocytosis, which can indicate infection, inflammation, or leukemic neoplasia. Describe basics of bone marrow examination, including the indication for this procedure, the types of cells expected to be found under normal conditions, and how to recognize abnormalities that may indicate hematologic diseases. Develop foundational skills in using a microscope for the examination of hematologic slides, including adjusting magnification, focusing, and slide preparation techniques. Practice critical thinking and diagnostic reasoning by interpreting slide findings in the context of clinical presentations, understanding how these laboratory results contribute to the diagnosis and management of hematological disorders. Enhance communication skills to discuss laboratory findings and their clinical relevance effectively, preparing students for future patient interactions and interdisciplinary collaboration. Appreciate for the precision and importance of laboratory work in the diagnosis and monitoring of patients, emphasizing the role of detailed observation and meticulous record-keeping. 	Hand on in skill lab •Duration 2 hrs •Conducted by senior faculty member of surgical unit

Cardiovascular System Module There will be 3 days of clinical rotations.

Rotation To Cardiology Department

Cardiology CVS Module First MBBS 2024		
Sessions	Learning Objectives At the end of the session, students will be able to	Teaching Strategy
I See cases of Heart Failure and Dyspnea Raised JVP/Oedema	 describe the basic pathophysiological mechanisms leading to heart failure, including systolic and diastolic dysfunction, and understand how these mechanisms can lead to the development of dyspnea. Identify the Common Signs and Symptoms of Heart Failure and Dyspnea: Conduct a focused patient history and physical examination for a patient presenting with dyspnea, emphasizing the importance of these skills in differentiating heart failure from other causes of dyspnea. Appreciate the Multidisciplinary Approach to Managing Patients with Heart Failure: Identify the clinical features of edema, differentiate between types of edema (e.g., peripheral vs. pulmonary), and understand the common causes including but not limited to cardiac, renal, and hepatic pathologies. Enlist causes of raised JVP 	Bedside teaching •Duration 2 hrs •Conducted by senior faculty member of surgical unit
II Clinical Examination of Precordium Normal Heart Sounds Additional heart sounds	 To understand and describe the anatomical boundaries and landmarks of the precordium, emphasizing the significance of each area in relation to underlying cardiac structures To develop proficiency in performing a systematic and thorough cardiac examination, including inspection, palpation, and auscultation of the precordium. Identify normal heart sounds and murmurs, differentiating between systolic and diastolic murmurs, and correlating physical findings with potential cardiac pathologies. To enhance clinical reasoning and diagnostic skills through the interpretation of physical examination findings, enabling the early identification of common cardiac conditions. 	Bedside teaching •Duration 1.5 hrs •Conducted by senior faculty member of surgical unit

III See Cases of Coronary Heart Disease	 Observe and understand the clinical presentation of coronary artery disease (CAD), including the recognition of typical and atypical symptoms such as chest pain, shortness of breath, and fatigue. Gain exposure to the diagnostic evaluation and management strategies for patients with coronary artery disease, observing how medical history, physical examination, and diagnostic tests (e.g., ECG, echocardiography, stress tests) are integrated to establish a diagnosis and formulate a treatment plan. Develop an appreciation for the importance of patient education and counseling in the management of coronary artery disease. 	Bedside teaching •Duration 1.5 hrs •Conducted by senior faculty member of
	the management of coronary artery disease.	surgical unit

Rotation to Radiology Department

Radiology CVS Module			
9.1	First MBBS 2024		
Sessions	Learning Objectives	Teaching Strategy	
	At the end of the session students will be able to		
I	Appreciate fundamentals of chest X-ray interpretation, including the	Bedside teaching	
X-Ray chest	identification of normal anatomy such as the heart, lungs, diaphragm, and rib cage.	•Duration 2 hrs	
	 Develop skills in systematically analyzing chest X-rays, focusing on the 	•Conducted by senior	
	assessment of lung fields, heart size and shape, and the presence of any abnormal	faculty member of surgical	
	shadows or lesions.	unit	
	 Understand the clinical context in which chest X-rays are utilized, including 		
	indications for ordering a chest X-ray, interpreting its findings in conjunction with		
	patient symptoms and history, and appreciating the importance of follow-up		
	investigations or referrals when abnormal findings are detected.		
	 Understand the definition, causes, and pathophysiology of cardiomegaly, 		
	emphasizing the importance of recognizing the condition as an indicator of	Bedside teaching	
	underlying cardiac diseases such as hypertensive heart disease, dilated	•Duration 1.5 hrs	
II	cardiomyopathy, and valvular disorders.	•Conducted by senior	
Cardiomegaly	Develop the ability to identify signs of cardiomegaly on physical examination and	faculty member of surgical	
	diagnostic imaging, particularly focusing on chest X-ray interpretation.	unit	
	 Appreciate the clinical implications of cardiomegaly, including its impact on 		
	patient symptoms, prognosis, and management strategies.		

III Radiological signs of heart failure	 Appreciate the key radiological signs of heart failure on chest X-rays, including cardiomegaly, pulmonary congestion, and pleural effusions. Understand the progression of these signs, and correlating them with the underlying pathophysiological changes in the heart and lungs. Develop the ability to systematically evaluate a chest X-ray for evidence of heart failure, focusing on the assessment of heart size, lung field abnormalities, and the presence of Kerley B lines, interstitial edema, and alveolar edema. Appreciate the role of radiological imaging in the diagnosis, management, and monitoring of heart failure, understanding how chest X-rays complement other diagnostic modalities such as echocardiography and cardiac MRI. 	Bedside teaching •Duration 1.5 hrs •Conducted by senior faculty member of surgical unit

Rotation to Pediatric Department

Pediatrics CVS Module First MBBS 2024		
Sessions	Learning Objectives	Teaching Strategy
	At the end of the session ,students will be able to	
I See cases of congenital heart diseases	 Observe and understand the diverse clinical presentations of congenital heart diseases (CHD), including common conditions such as ventricular septal defect (VSD), atrial septal defect (ASD), patent ductus arteriosus (PDA), and Tetralogy of Fallot. This includes recognizing the signs and symptoms that may suggest a CHD, such as cyanosis, heart murmurs, and failure to thrive in infants and children. Understand diagnostic evaluation of congenital heart diseases, observing how clinical findings are integrated with diagnostic tools such as echocardiography, 	Bedside teaching •Duration 2 hrs •Conducted by senior faculty member of surgical unit
	 chest X-rays, and cardiac catheterization to establish a diagnosis. Gain insight into the management and treatment options for congenital heart diseases, including surgical and non-surgical interventions. 	
	Observe and understand the clinical presentation and unique challenges of diagnosing heart failure in pediatric patients, including recognizing the signs and symptoms that may differ from adults, such as poor feeding, failure to thrive,	Bedside teaching

	excessive sweating, and rapid breathing	•Duration 1.5 hrs
II Pediatric case of Heart Failure	 Understand the etiology and pathophysiology of heart failure in pediatric cases, emphasizing the role of congenital heart defects, cardiomyopathies, and acquired heart diseases. Appreciate the multidisciplinary approach in the management of pediatric heart failure, including the integration of clinical evaluations, diagnostic imaging, pharmacological treatments, and when necessary, surgical interventions. 	•Conducted by senior faculty member of surgical unit

Respiratory Module
Class will be divided in three batches There will be 3 days of clinical rotations

	Medicine	
	Respiratory Module	
	First MBBS 2024	
Sessions	Learning Objectives	Teaching Strategy
	At the end of the session ,students will be able to	
I Dyspnea Observe/see patients	 Understand the clinical presentation of dyspnea, particularly in the context of heart failure, including how to differentiate it from respiratory causes based on patient history, physical examination, and key clinical findings. Describe pathophysiological mechanisms leading to dyspnea in heart failure, such as reduced cardiac output and pulmonary congestion. Engage in the discussion of case studies involving patients with dyspnea due to heart failure, aiming to integrate clinical knowledge with practical skills in diagnosing and managing such cases. This will include exploring the role of diagnostic tools such as chest X-rays, echocardiograms, and BNP levels in confirming heart failure and assessing its impact on patient care and treatment strategies. 	Bedside teaching •Duration 2 hrs •Conducted by senior faculty member of medical unit
II Cyanosis & see Asthma case COPD cases	 Identify and differentiate between central and peripheral cyanosis as clinical signs, understanding their pathophysiology and implications in the context of cardiovascular and respiratory diseases, including heart failure. Discuss the clinical presentation, diagnostic approach, and management strategies for patients with Chronic Obstructive Pulmonary Disease (COPD) and asthma, particularly focusing on how these conditions can complicate or coexist with heart failure. 	Bedside teaching •Duration 1.5 hrs •Conducted by senior faculty member of Medical

	 Critically analyze case studies of patients presenting with cyanosis, COPD, and asthma in the setting of heart failure, emphasizing the importance of a comprehensive clinical evaluation, the use of appropriate diagnostic tests (e.g., spirometry, chest X-rays, arterial blood gases 	unit
III Tuberculosis cases with fibrosis of	 Understand the clinical manifestations and radiographic features of tuberculosis and pulmonary fibrosis, especially when occurring in conjunction with heart failure. 	
lungs	• Discuss the pathophysiological mechanisms by which tuberculosis and pulmonary fibrosis can affect cardiac function, leading to or worsening existing heart failure.	

Rotation To Surgery

Surgery				
Respiratory Module				
	First MBBS 2024			
Sessions	Learning Objectives	Teaching Strategy		
	At the end of the session ,students will be able to			
I See cases of Flail chest & Pneumothorax	 Observe and identify the clinical signs and symptoms of flail chest and pneumothorax, including the unique presentation of paradoxical chest movement in flail chest and the sudden onset of sharp, unilateral chest pain and dyspnea in pneumothorax. Understand the pathophysiology behind flail chest and pneumothorax, focusing on the mechanisms of injury, the impact on respiratory mechanics, and the potential complications such as respiratory failure and tension pneumothorax. Engage with the diagnostic and management strategies for flail chest and pneumothorax, including the appropriate use of imaging studies like chest X-rays and CT scans for accurate diagnosis, and the understanding of both conservative and surgical treatment options. 	Bedside teaching •Duration 2 hrs •Conducted by senior faculty member of surgery unit		
II Chest intubation	 Enlist the indications and contraindications for chest tube intubation, focusing on the recognition of conditions that necessitate this intervention such as pneumothorax, hemothorax, and pleural effusion. Discuss the procedural steps, techniques, and equipment used in chest tube insertion, including site selection, aseptic technique, and the confirmation of correct tube placement. Describe the multidisciplinary approach to the care of patients requiring chest tube intubation, highlighting the roles of different healthcare professionals in ensuring successful outcomes. 	Bedside teaching •Duration 1.5 hrs •Conducted by senior faculty member of surgery unit		

Rotation to Radiology

Radiology											
	Respiratory Module										
	First MBBS 2024										
Sessions	Learning Objectives	Teaching Strategy									
	At the end of the session ,students will be able to										
I Radiology of chest	 Describe the basic principles of chest radiology, including the understanding of radiographic anatomy and the interpretation of normal chest X-ray findings. Develop skills in systematically analyzing chest radiographs, focusing on identifying and interpreting common abnormalities such as lung infiltrates, pleural effusions, pneumothorax, and signs of heart failure. Appreciate the clinical relevance and limitations of chest radiology in diagnosing and managing thoracic diseases. 	 SGD Duration 2 hrs Conducted by senior faculty member of Radiology Department 									
II Chest X-ray at different level with reference to Anatomy and Pathologies	 To deepen understanding of the detailed anatomy of the chest as visualized on X-ray, including the recognition of anatomical structures such as the trachea, bronchi, lungs, heart, great vessels, bones (ribs, clavicles, scapulae, and spine), and diaphragm. This objective aims to enable students to correlate specific areas on the X-ray with their anatomical counterparts, enhancing their ability to pinpoint the location of pathological findings. Develop the skill to identify and differentiate between normal anatomical variations and pathological changes on chest X-rays. Explore the integration of chest X-ray findings with clinical data for comprehensive patient assessment, emphasizing the importance of a systematic approach to the interpretation of radiographic images in the context of patient history and physical examination findings. 	Duration 1.5 hrs Conducted by senior faculty member of Radiology Department									

ECE Log Book

Paste Photograph

Student's Profile

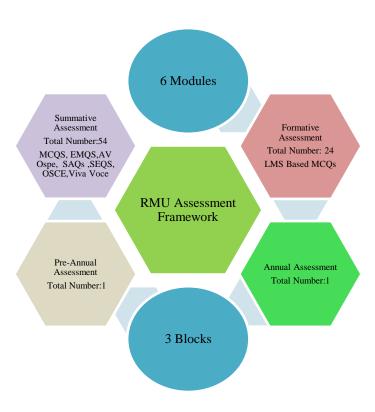
(2x2 Size) Roll No._____ Name:_____ Batch: Class: Session: Contact Detail: -----Phone: Mobile: Hostelite/Dayscholar:_____ Landline_____ Parents / Guardian Contact #(Mobile)_____ Postal Address: Guardian Email:

Proforma For Early Clinical Exposure for First Year MBBS

Sr. No	Date	Time	Module	Batch	Topic of the Session	Subject	Unit	Name & Sign of Teacher







Assessment

Assessment is the systematic basis for making inferences about the learning and development of students. It is the process of defining, selecting, designing, collecting, analyzing, interpreting, and using information to increase students' learning and development.

Assessment Policy

Scope

This policy is applicable to all the students of the MBBS program of RMU for all modes of teaching (on campus/online/any other) from the date of approval by the RMU Academic Council.

1. Guiding principles

- RMU has the responsibility to ensure to all the stakeholders that students have achieved the identified outcomes of the medical degree course.
- Assessment requires a variety of methods; no single method can completely ensure that the requisite competence level has been achieved. Hence each assessment instrument must be selected based on its utility index.
- Feedback, ensuring that the feedback loop is closed, should be provided to students following all assessments to ensure that students identify gaps in their learning and faculty can review future curricular and assessment content.
- The quality of the entire assessment including confidentiality of the assessment process must be ensured.
- The assessment process should be clear and transparent so that students know in advance the expectations (from students) and consequences of the assessment.
- Details of the conduct of examinations are available in the Examination policy document.

2. Purposes of Assessment.

- To ensure appropriate competence has been achieved.
- Feedback to students regarding their readiness and deficiencies
- Feedback to faculty to evaluate the effectiveness of the teaching program.

3. Forms of assessments

3.1 Formative Assessment

A formative assessment refers to a low-stakes assessment that does not normally contribute towards a student's final grade. Assessment for learning is carried out throughout modules and clerkships using various strategies (at the discretion of module coordinators and clerkship directors feedback. Weekly assessment of Large Group Interactive Session (LGIS) and Self-Directed Learning (SDL) Sessions will be conducted on LMS (learning management system). The LMS result will be shared by module coordinator and DME through vice chancellor on weekly basis

3.2 Summative Assessment

A summative assessment is performed at the end of a unit that allows a teacher to measure a student's understanding, typically against a standardized criterion. These Assessment includes End of Module Assessment (EMA), End of Block Assessment (EBA), Pre- Annual Assessment (PAA) and Annual Professional Assessment (APA). Each Assessment comprises of theory component and a practical component.

3.2.1 Components of Assessment

- Cognitive competence is tested in the theory component using the following tool of assessment
 - USMLE/ PLAB Type / Multiple Choice Questions (MCQs)
 - o USMLE/PLAB Type / Extended Match Questions (EMQ)
 - Short Answer Questions (SAQs)
 - Short Essay Questions (SEQs)
- Competence in psychomotor and affect domains is tested in practical component using the following tools of assessment
 - o Audio Visual OSPE (AVOSPE): This comprises of stations using PowerPoint slides with images animations and videos
 - o Laboratory OSPE (Lab OSPE): This comprises of stations focused on practical (hands on performance) components from core subject areas
 - o Integrated OSPE (I OSPE): This comprises of stations, from each core subject, emphasizing horizontal and vertical integration
 - Objective Structured Clinical Examinations (OSCE): This comprises of stations, dedicated to Early Clinical Exposure (ECE), Simulated Patients (SP), models, ALPHA and clinical component of core subjects
 - Objective Structured Viva Examinations (OSVE): This comprises of table viva for each core subject. Students will be evaluated by internal and external examiner using a structured marking rubric, with each viva

3.2.2 End of Module Assessment (EMA)

- End of module assessments will be conducted at the end of each module.
- The module teams will be responsible for the assessment plan including assessment strategies, timings, and other essentials

3.2.3 End of Block Assessment (EBA)

- End of block assessments will be conducted at the end of each block.
- The block teams will be responsible for the assessment plan including assessment strategies, timings, and other essentials
- 80% attendance in each subject will be mandatory
- Student must pass in all LMS, mid module assessments to appear in EBA
- There will be no remedial classes for attendance compensation
- There will be no remedial of assessment in case of poor academic performance

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

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		92.								Do	mains	: C-Core	Subje	ct (70	%) Le	vels (:1-C2, I	IV- Horiz	ontal &	Vertic	al Integ	ration	(20%) Le	els C2-	-C3, S-	Spiral	Integ	ration (10%) Lev	els C2-C3							
												The	ory (Cogni	tive)	Asses	sment				***			100				- 40		Practical (Skill & Attitu	de) Assessr	ment		11.5		
End of Module Assessment	Subject			١	ACQs				EI	MQs			1240	SAQ	s				SEQ	s		Mari	Total	ks	Total Time		A	V OSPE		Time	AED Reflective Writing		OSVE		Total Practical Marks	Grand Total	Total Time of Module Assessment
		C	HV	S	Tota	al I	Marks	C	Total	Ma	arks	C	HV		1	otal	Marks	C	HV	S	Tota	I	1,,,,,	3		CI	HV S	Total	Marks		Š	Viva	Сору	Total			
	Anatomy	19	4	2	25		25	1	1	y, y, 3	5	3	1	1		5	25	3	1	1	5	45	10) [2 HRS	7	2 1	10	50	50 min	15 min	45	5	50	100	200	6 HRS
First Module	Physiology	19	4	2	25		25	1	1		5	3	1	1	01	5	25	3	1	1	5	45	10) [2 HRS	7	2 1	10	50	50 min	15 min	45	5	50	100	200	6 HRS
	Biochemistry	19	4	2	25	3	25	1	1	y, y,	5	3	1	1		5	25	3	1	1	5	45	10) ;	2 HRS	7	2 1	10	50	50 min	15 min	45	5	50	100	200	6 HRS
Formative- Week	dy LMS Based Assess	ment	of 30	MCC	s (10	MCQ	s per S	ubjec	t)																												
				Г		T		-	9	25 25										2						П											
			Theory (Cognitive) Assessment Practical (Skill & Attitude) Assessment																Total Time of																		
End of Module Assessment	Subject			N	ACQs				El	MQs				SAQ	s				SEQ	ls		Mari	Total	ks	Total		A	V OSPE		Time	AED Reflective		OSVE		Total Practical	Grand Total	Module
(A. 1) (A. 1) (A. 1) (A. 1)		C	н۷	S	Tota	al I	Marks	C	Total	Ma	arks	С	HV	9	1	otal	Marks	С	HV	S	Tota	Ī	Theo	ry	Time	C	HV S	Total	Marks	179197755	Writing	Viva	Сору	Total	Marks	10000	Assessment
Cocond	Anatomy	19	4	2	25	8	25	1	1	3 to 2	5	3	1	1		5	25	3	1	1	5	45	10) [2 HRS	7	2 1	10	50	50 min	15 min	45	5	50	100	200	6 HRS
Second Module	Physiology	19	4	2	25		25	1	1		5	3	1	1		5	25	3	1	1	5	45	10) [2 HRS	7	2 1	10	50	50 min	15 min	45	5	50	100	200	6 HRS
iviodule	Biochemistry	19	4	2	25	3	25	1	1		5	3	1	1		5	25	3	1	1	5	45	10) ;	2 HRS	7	2 1	10	50	50 min	15 min	45	5	50	100	200	6 HRS
Formative- Week	dy LMS Based Assess	men t	of 30	MCC	(s (10	MCQ	s per S	ubjec	it)																												

Disale	Subjects		LMS	Base	d Assess	ment		Gran	Total Block					
DIOCK	Subjects			. 1	ACQs		LabOSPE	IOSPE	COSPE	Total	Marke	Time	· a	Time
BLOCK		С	HV	S	Total	Time	C	HV	S	Total Marks Time		TOTAL		
BLOCK	Anatomy	21	- (5 3	30	30 min	14	4	2	20	60	6 HRS	90	10 HRS
	Physiology	21	-	5 3	30	30 min	14	4	- 2	20	60	6 HRS	90	10 HRS
	Biochemistry	21	- (5 3	30	30 min	14	4	- 2	20	60	6 HRS	90	10 HRS
-	50% Ques	tions/	OSPE	Stat	ions/Viv	a Stations	will be from	Foundation	Module and	50%	Questio	ns will b	e from	MSK-1 Mod
			For I	Each a	ssessm	ent studen	t will have to	individually	pass Theor	y and	Practica	l compo	onents	

Marks per

ltem	V2:	19521		25	5
MCQ=1	EMQ=5	SAQ= 5	SEQ= 9	AVOSPE= 5	OSPE= 3
	OSPE Time=1 Round of 40 S	tudents =80 min	,		72
	3 Round of 40 S	tudents =240 min			
	OSVE=Time per stude	ent=5mins			

3.2.4 Continuous Internal Assessment (CIA)

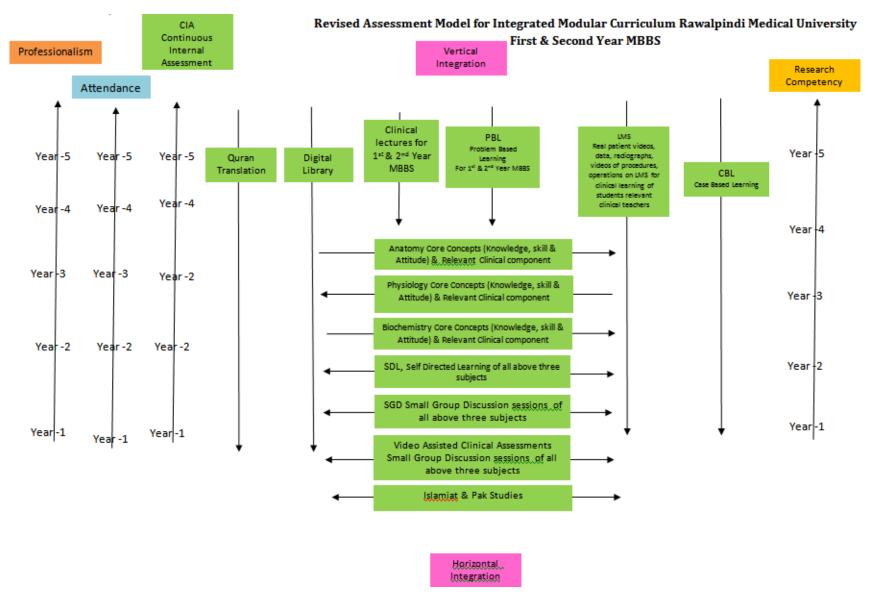
Continuous Internal Assessment means the assessment based on tests and assignments given to the students during an academic period.

Break up of internal assessment is as follows:

Blocks	Subjects	Total marks	Module 1	Module 2	Total marks	
Block 1	Anatomy	30 marks	15 marks	15 marks		
90 Marks	Physiology	30 marks	15 marks	15 marks	90 Marks	
30 IVIdI KS	Biochemistry	30 marks	15 marks	15 marks		
Block 2	Anatomy	30 marks	15 marks	15 marks		
90 Marks	Physiology	30 marks	15 marks	15 marks	90 Marks	
90 IVIAI KS	Biochemistry	30 marks	15 marks	15 marks		
DII-0	Anatomy	30 marks	15 marks	15 marks		
Block 3	Physiology	30 marks	15 marks	15 marks	90 Marks	
90 Marks	Biochemistry	30 marks	15 marks	15 marks		
				Total marks	270 Marks	

Once internal assessment is compiled it CANNOT be altered under ANY circumstance unless a clerical/ human error is detected. He will repeat classes and skills There will be no change in calculated internal assessment scores for supplementary University examination.

I. Diagrammatic Presentation of Various Components of Clinically Oriented Integrated Modular Curriculum of Rawalpindi Medical University



Reference: The Integrated & Clinically Oriented Assessment Model For Under Graduates Rawalpindi Medical University "Mumtahin" (The Examiner)

No. of Assessments of Physiology for First Year MBBS (Block- I):

				Total .	Assessments Time				
Block	Sr. #	Module – 1 Foundation Module Components	Type of Assessments	Assessment Time	Summative Assessment Time	Formative Assessment Time	No. of A	ssessments	
	1	End Module Examinations (SEQs,SAQs,EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2 Hours & 35 minutes	30 Minutes	1 Formative	2 Summative	
	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes					
	3	Weekly LMS based Assessment (MCQs based)	Formative	30 Minutes					
	Total	(1.10 %)		3	Hours & 05 Minut	tes	3 Asses	ssments	
				Total .	Assessments Time				
	Sr. #	Module – 2 MSK-I Module Components	Type of Assessments	Assessment Time	Summative Assessment Time	Formative Assessment Time	No. of Assessments		
Block – I	1	End Module Examinations (SEQs,SAQs,EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2 Hours &		2	2	
B	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes	35 minutes	60 Minutes	Formative	Summative	
	3	2 Weekly LMS based Assessment (MCQs based)	Formative	2 x 30 Minutes					
	Total			3 Ho	urs & 35 Minutes		4 Assess	sments	
			Type of	Total As	sessments Time				
	Sr. #	Block – I Assessment	Assessments	Assessment Time	Summative Assessment Time	Formative Assessment Time	No. of Assessments		
	1	Objectively Structured Practical Examination (OSPE)	Summative	5 Hours	5 Hours & 30 minutes			2 Summative	
	2	LMS Based Block Assessment (MCQs based)	Summative	30 Minutes				Summauve	
		Total		5 Hou	ırs & 30 Minutes		2 Assessments		

No. of Assessments of Physiology for First Year MBBS (Block- II):

				Tota	l Assessments Ti	me			
Block	Sr. #	Module – 3 MSK-II Module Components	Type of Assessments	Assessment Time	Summative Assessment Time	Formative Assessment Time	No. of Assess	sments	
	1	End Module Examinations (SEQs, SAQs, EMQs, MCQs Av OSPE Based)	Summative	2 Hours 25 minutes	2 Hours & 35 minutes	30 Minutes	1 Formative	2 Summative	
	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes					
	3	Weekly LMS based Assessment (MCQs based)	Formative	30 Minutes					
	Total				Hours & 05 Mi		3 Assessme	ents	
				Tota	l Assessments Ti				
	Sr. #	Module – 4 Blood & Immunity Module Components	Type of Assessments	Assessment Time	Summative Assessment Time	Formative Assessment Time	No. of Assessments		
Block – II	1	End Module Examinations (SEQs,SAQs,EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2 Hours &		2	2	
BIC	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes	35 minutes	60 Minutes	Formative	Summative	
	3	2 Weekly LMS based Assessment (MCQs based)	Formative	2 x 30 Minutes					
	Total			3 H	ours & 35 Minut	tes	4 Assessmer	nts	
			Type of		ssessments Time				
	Sr. #	Block – II Assessment	Assessments	Assessment	Summative	Formative	No. of Assess	ments	
	220			Time	Assessment Time	Assessment Time			
	1	Objectively Structured Practical Examination (OSPE)	Summative	5 Hours	5 Hours & 30 minutes			2 Summative	
	2	LMS Based Block Assessment (MCQs based)	Summative	30 Minutes	50 minutes			Summun	
		Total			ours & 30 Minut	es	2 Assessments		

No. of Assessments of Physiology for First Year MBBS (Block- ${\bf III}$):

				Total A	Assessments Time				
Block	Sr. #	Module – 5 CVS Module Components	Type of Assessment s	Assessment Time	Summative Assessment Time	Formative Assessment Time	No. of Assessments		
	1	End Module Examinations (SEQs, SAQs, EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2 Hours & 35 minutes	30 Minutes	1 Formative	2 Summative	
	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes	35 minutes				
	3	Weekly LMS based Assessment (MCQs based)	Formative						
	Total				3 Hours & 05 Min		3 Asso	essments	
				Total A	Assessments Time				
п	Sr. #	Module – 6 Respiration Module Components	Type of Assessments	Assessment Time	Summative Assessment Time	Formative Assessment Time	No. of Assessments		
Block – I	1	End Module Examinations (SEQs, SAQs, EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2 Hours &		2	2	
B	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes	35 minutes	60 Minutes	Formative	2 Summative	
	3	2 Weekly LMS based Assessment (MCQs based)	Formative	2 x 30 Minutes					
	Total				urs & 35 Minutes		4 Asses	sments	
			Type of	Total As	sessments Time				
	Sr. #	Block – III Assessment	Assessments	Assessment Time	Summative Assessment Time	Formative Assessment Time	No. of Assessments		
	1	Objectively Structured Practical Examination (OSPE)	Summative	5 Hours	5 Hours & 30 minutes			2 Summative	
	2	LMS Based Block Assessment (MCQs based)	Summative	30 Minutes					
		Total		5 Hou	ırs & 30 Minutes		2 Assessments		

Total Time of Physiology Assessments for First Year MBBS:

Module	Summative Assessment Time	Formative Assessment Time	Total Assessments Time
Foundation Module	2 Hours & 35 minutes	30 Minutes	3 Hours & 05 Minutes
MSK-I Module	2 Hours & 35 minutes	60 Minutes	3 Hours & 35 Minutes
Block -I	5 Hours & 30 Minutes		5 Hours & 30 Minutes
MSK-II Module	2 Hours & 35 minutes	30 Minutes	3 Hours & 05 Minutes
Blood & Immunity	2 Hours & 35 minutes	60 Minutes	3 Hours & 35 Minutes
Module			
Block -II	5 Hours & 30 Minutes		5 Hours & 30 Minutes
CVS Module	2 Hours & 35 minutes	30 Minutes	3 Hours & 05 Minutes
Respiration Module	2 Hours & 35 minutes	60 Minutes	3 Hours & 35 Minutes
Block -III	5 Hours & 30 Minutes		5 Hours & 30 Minutes
Pre-Annual Examination			7 Hours & 45 Minutes
First Professional			3 Hours & 45 Minutes
Grand Total	31 Hours & 30 Minutes	4 hours and 30 minutes	48 Hours

Total Teaching Hours vs Total Assessment Hours

	Grand Total Teaching Hours	Grand Total Assessment Hours
	225 hours:	48 Hours
Ratio of Teaching Hours	9:2	
to Assessments Hours		

No. of Assessments of Anatomy for First Year MBBS (Block- I):

				Tota	l Assessments Tim	ne		
Block	Sr. #	Module – 1 Foundation Module Components	Type of Assessments	Assessment Time	Summative Assessment Time	Formative Assessment Time	No. of Asses	sments
	1	End Module Examinations (SEQs, SAQs, EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2 Hours & 35 minutes	30 Minutes	1 Formative	2 Summative
	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes				
	3	Weekly LMS based Assessment (MCQs based)	Formative	30 Minutes				
	Total				3 Hours & 05 Min		3 Assessm	ents
				Tota	l Assessments Tim	ne		
I	Sr. #	Module – 2 MSK-I Module Components	Type of Assessments	Assessment Time	Summative Assessment Time	Formative Assessment Time	No. of Asses	sments
Block –	1	End Module Examinations (SEQs,SAQs,EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2.11		2	2
	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes	2 Hours & 35 minutes	60 Minutes	2 Formative	2 Summative
	3	2 Weekly LMS based Assessment (MCQs based)	Formative	2 x 30 Minutes				
	Tota				ours & 35 Minute	S	4 Assessme	nts
			Type of		ssessments Time			
	Sr. #	Block – I Assessment	Assessments	Assessment Time	Summative Assessment Time	Formative Assessment Time	No. of Assess	sments
	1	(OSPE)	Summative	5 Hours	5 Hours & 30 minutes			2 Summative
	2	LMS Based Block Assessment (MCQs based)	Summative	30 Minutes				
		Total		5 He	ours & 30 Minutes	S	2 Assessm	ents

No. of Assessments of Anatomy for First Year MBBS (Block- II):

				Total	Assessments Time			
Block	Sr. #	Module – 3 MSK-II Module Components	Type of Assessments	Assessment Time	Summative Assessment Time	Formative Assessment Time	No. of A	Assessments
	1	End Module Examinations (SEQs, SAQs, EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2 Hours & 35 minutes	30 Minutes	1 Formative	2 Summative
	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes				
	3	Weekly LMS based Assessment (MCQs based)	Formative	30 Minutes				
	Total			3	Hours & 05 Minut	es	3 Ass	essments
				Total	Assessments Time			
	Sr. #	Module – 4 Blood & Immunity Module Components	Type of Assessments	Assessment Time	Summative Assessment Time	Formative Assessment Time	No. of A	Assessments
Block – II	1	End Module Examinations (SEQs,SAQs,EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2 Hours &		2	2
Bl	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes	35 minutes	60 Minutes	Formative	Summative
	3	2 Weekly LMS based Assessment (MCQs based)	Formative	2 x 30 Minutes				
	Total			3 Но	urs & 35 Minutes		4 Asses	ssments
			Type of	Total As	sessments Time			
	Sr. #	Block – II Assessment	Assessments	Assessment Time	Summative Assessment Time	Formative Assessment Time	No. of A	ssessments
	1	Objectively Structured Practical Examination (OSPE)	Summative	5 Hours	5 Hours & 30 minutes			2 Summative
	2	LMS Based Block Assessment (MCQs based)	Summative	30 Minutes				
		Total		5 Ho	urs & 30 Minutes		2 Ass	essments

No. of Assessments of Anatomy for First Year MBBS (Block- III):

				Total	Assessments Tir	ne		
Block	Sr. #	Module – 5 CVS Module Components	Type of Assessments	Assessment Time	Summative Assessment Time	Formative Assessment Time	No. of A	Assessments
	1	End Module Examinations (SEQs,SAQs,EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2 Hours & 35 minutes	30 Minutes	1 Formative	2 Summative
	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes				
	3	Weekly LMS based Assessment (MCQs based)	Formative	30 Minutes				
	Total	(2.20 % 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		3	Hours & 05 Mi	nutes	3 Ass	essments
				Total	Assessments Tir	ne		
	Sr. #	Module – 6 Respiration Module Components	Type of Assessments	Assessment Time	Summative Assessment Time	Formative Assessment Time	No. of A	Assessments
Block – II	1	End Module Examinations (SEQs,SAQs,EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2 Hours &		2	2
BI	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes	35 minutes	60 Minutes	Formative	Summative
	3	2 Weekly LMS based Assessment (MCQs based)	Formative	2 x 30 Minutes				
	Total			3 Ho	ours & 35 Minut	es	4 Asses	ssments
			Type of	Total As	ssessments Time			
	Sr. #	Block – III Assessment	Assessments	Assessment Time	Summative Assessment Time	Formative Assessment Time	No. of A	ssessments
	1	Objectively Structured Practical Examination (OSPE)	Summative	5 Hours	5 Hours & 30 minutes			2 Summative
	2	LMS Based Block Assessment (MCQs based)	Summative	30 Minutes				
		Total		5 Ho	urs & 30 Minute	es	2 Ass	essments

Total Time of Anatomy Assessments for First Year MBBS:

Module	Summative Assessment Time	Formative Assessment Time	Total Assessments Time
Foundation Module	2 Hours & 35 minutes	30 Minutes	3 Hours & 05 Minutes
MSK-I Module	2 Hours & 35 minutes	60 Minutes	3 Hours & 35 Minutes
Block -I	5 Hours & 30 Minutes		5 Hours & 30 Minutes
MSK-II Module	2 Hours & 35 minutes	30 Minutes	3 Hours & 05 Minutes
Blood & Immunity	2 Hours & 35 minutes	60 Minutes	3 Hours & 35 Minutes
Module			
Block -II	5 Hours & 30 Minutes		5 Hours & 30 Minutes
CVS Module	2 Hours & 35 minutes	30 Minutes	3 Hours & 05 Minutes
Respiration Module	2 Hours & 35 minutes	60 Minutes	3 Hours & 35 Minutes
Block -III	5 Hours & 30 Minutes		5 Hours & 30 Minutes
Pre-Annual Examination			7 Hours & 45 Minutes
First Professional			3 Hours & 45 Minutes
Grand Total	31 Hours & 30 Minutes	4 hours and 30 minutes	48 Hours

Total Teaching Hours vs Total Assessment Hours

	Grand Total Teaching Hours 250 Hours:	Grand Total Assessment Hours 48 Hours
Ratio of Teaching Hours to Assessments Hours	5:1	

No. of Assessments of Biochemistry for First Year MBBS (Block- I):

				Total A	Assessments Time			
Block	Sr. #	Module – 1 Foundation Module Components	Type of Assessments	Assessment Time	Summative Assessment Time	Formative Assessment Time	No. of Assessments	
	1	End Module Examinations (SEQs,SAQs,EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2 Hours & 35 minutes	30 Minutes	1 Formative	2 Summative
	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes	33 minutes			<i>S</i> 3.11.11.11
	3	Weekly LMS based Assessment (MCQs based)	Formative	30 Minutes				
	Total				3 Hours & 05 N	l inutes	3 Ass	essments
				Total A	Assessments Time			
I	Sr. #	Module – 2 MSK-I Module Components	Type of Assessments	Assessment Time	Summative Assessment Time	Formative Assessment Time	No. of Assessments	
Block –	1	End Module Examinations (SEQs,SAQs,EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	211 0			2
В	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes	2 Hours & 35 minutes	60 Minutes	2 Formative	2 Summative
	3	2 Weekly LMS based Assessment (MCQs based)	Formative	2 x 30 Minutes				
	Total			3 Ho	urs & 35 Minutes		4 Asses	ssments
			Type of	Total As	sessments Time			
	Sr. #	Block – I Assessment	Assessments	Assessment Time	Summative Assessment Time	Formative Assessment Time	No. of A	ssessments
	1	Objectively Structured Practical Examination (OSPE)	Summative	5 Hours	5 Hours & 30 minutes			2 Summative
	2	LMS Based Block Assessment (MCQs based)	Summative	30 Minutes				
		Total		5 Hours & 30 Minutes			2 Ass	essments

No. of Assessments of Biochemistry for First Year MBBS (Block- II):

				Total	Assessments Tir	ne		
Block	Sr. #	Module – 3 MSK-II Module Components	Type of Assessments	Assessment Time	Summative Assessment Time	Formative Assessment Time	No. of Ass	essments
	1	End Module Examinations (SEQs,SAQs,EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2 Hours & 35 minutes	30 Minutes	1 Formative	2 Summative
	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes				
	3	Weekly LMS based Assessment (MCQs based)	Formative	30 Minutes				
	Total				Hours & 05 Min		3 Assess	ments
				Total	Assessments Tir			
	Sr. #	Module – 4 Blood & Immunity Module Components	Type of Assessments	Assessment Time	Summative Assessment Time	Formative Assessment Time	No. of Ass	essments
Block – II	1	End Module Examinations (SEQs,SAQs,EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2 Hours &		2	2
Bl	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes	35 minutes	60 Minutes	Formative	Summative
	3	2 Weekly LMS based Assessment (MCQs based)	Formative	2 x 30 Minutes				
	Total			3 Ho	ours & 35 Minute	es	4 Assessn	nents
			Type of	Total As	ssessments Time			
	Sr. #	Block – II Assessment	Assessments	Assessment Time	Summative Assessment Time	Formative Assessment Time	No. of Asse	essments
	1	Objectively Structured Practical Examination (OSPE)	Summative	5 Hours	5 Hours & 30 minutes			2 Summative
	2	LMS Based Block Assessment (MCQs based)	Summative	30 Minutes				
		Total 5 Hours & 30 Minutes				S	2 Assess	ments

No. of Assessments of Biochemistry for First Year MBBS (Block- III):

				Total	Assessments Time			
Block	Sr. #	Module – 5 CVS Module Components	Type of Assessments	Assessment Time	Summative Assessment Time	Formative Assessment Time	No. of Asse	essments
	1	End Module Examinations (SEQs,SAQs,EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2 Hours & 35 minutes	30 Minutes	1 Formative	2 Summative
	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes				
	3	Weekly LMS based Assessment (MCQs based)	Formative	30 Minutes				
	Total				3 Hours & 05 Minute	es	3 Assessn	nents
		M 11 (Total	Assessments Time			
	Sr. #	Module – 6 Respiration Module Components	Type of Assessments	Assessment Time	Summative Assessment Time	Formative Assessment Time	No. of Asse	ssments
Block – II	1	End Module Examinations (SEQs,SAQs,EMQs, MCQs AvOSPE Based)	Summative	2 Hours 25 minutes	2 Hours &		2	2
Bl	2	Structured & Clinically oriented Viva voce	Summative	10 Minutes	35 minutes	60 Minutes	Formative	Summative
	3	2 Weekly LMS based Assessment (MCQs based)	Formative	2 x 30 Minutes				
	Total			3 Ho	urs & 35 Minutes		4 Assessm	ents
			Type of		sessments Time			
	Sr. #	Block – III Assessment	Assessments	Assessment Time	Summative Assessment Time	Formative Assessment Time	No. of Asses	ssments
	1	Objectively Structured Practical Examination (OSPE)	Summative	5 Hours	5 Hours & 30 minutes			2 Summative
	2	LMS Based Block Assessment (MCQs based)	Summative	30 Minutes				
		Total		5 Hor	urs & 30 Minutes		2 Assessr	nents

Total Time of Biochemistry Assessments for First Year MBBS:

Module	Summative Assessment Time	Formative Assessment Time	Total Assessments Time
Foundation Module	2 Hours & 35 minutes	30 Minutes	3 Hours & 05 Minutes
MSK-I Module	2 Hours & 35 minutes	60 Minutes	3 Hours & 35 Minutes
Block -I	5 Hours & 30 Minutes		5 Hours & 30 Minutes
MSK-II Module	2 Hours & 35 minutes	30 Minutes	3 Hours & 05 Minutes
Blood & Immunity Module	2 Hours & 35 minutes	60 Minutes	3 Hours & 35 Minutes
Block -II	5 Hours & 30 Minutes		5 Hours & 30 Minutes
CVS Module	2 Hours & 35 minutes	30 Minutes	3 Hours & 05 Minutes
Respiration Module	2 Hours & 35 minutes	60 Minutes	3 Hours & 35 Minutes
Block -III	5 Hours & 30 Minutes		5 Hours & 30 Minutes
Pre Annual Examination			7 Hours & 45 Minutes
First Professional			3 Hours & 45 Minutes
Grand Total	31 Hours & 30 Minutes	4 hours and 30 minutes	48 Hours

Total Teaching Hours vs Total Assessment Hours

	Grand Total Teaching Hours 125 Hours:	Grand Total Assessment Hours 48 Hours
Ratio of Teaching Hours	5:2	
to Assessments Hours		

No. of Assessments of Clinical Component (Vertical and Horizontal Integration) for First Year MBBS (Block- I):

				Total Ass	essments Time	No. of
Block	Sr. #	Module – 1 Foundation Module Components	Type of Assessments	Assessment Time	Formative Assessment Time	Assessments
	1	Mid Module Examination (MCQs Based)	Formative	15 Minutes	45 Minutes	2 Formative
	2	End Module Examination (MCQs Based)	Formative	30 Minutes		
	Total			45 Minutes		2 Assessments
I				Total Ass	essments Time	No. of
Block -	Sr. #	Module – 2 MSK-I Module Components	Type of Assessments	Assessment Time	Formative Assessment Time	Assessments
B	1	Mid Module Examination (MCQs Based)	Formative	15 Minutes	45 Minutes	2 Formative
	2	End Module Examination (MCQs Based)	Formative	30 Minutes		
	Total			45 Minute	es	2 Assessments

No. of Assessments of Clinical Component (Vertical and Horizontal Integration) for First Year MBBS (Block-II):

				Total Asse	ssments Time	No. of Assessments
Block	Sr. #	Module – 3 MSK-II Module Components	Type of Assessments	Assessment Time	Formative Assessment Time	
	1	Mid Module Examination (MCQs Based)	Formative	15 Minutes	45 Minutes	2 Formative
	2	End Module Examination (MCQs Based)	Formative	30 Minutes		
	Total			45 Minutes		2 Assessments
П				Total Assessn	nents Time	No. of Assessments
Block -	Sr. #	Module – 4 Blood & Immunity Module Components	Type of Assessments	Assessment Time	Formative Assessment Time	
	1	Mid Module Examination (MCQs Based)	Formative	15 Minutes	45 Minutes	2 Formative
	2	End Module Examination (MCQs Based)	Formative	30 Minutes		
	Total			45 M	Iinutes	2 Assessments

No. of Assessments of Clinical Component (Vertical and Horizontal Integration) for First Year MBBS (Block- III):

			Type of	Total Asses	ssments Time	No. of Assessments
Block	Sr. # CVS Module Components	Module – 5 CVS Module Components	Assessments	Assessment Time	Formative Assessment Time	
	1	Mid Module Examination (MCQs Based)	Formative	15 Minutes	45 Minutes	2 Formative
	2	End Module Examination (MCQs Based)	Formative	30 Minutes		
	Total			45 Minutes		2 Assessments
			Type of	Total Asses	ssments Time	No. of Assessments
Block -	Sr. #	Module – 6 Respiration Module Components	Assessments	Assessment Time Formative Assessment Time		
B	1	Mid Module Examination (MCQs Based)	Formative	15 Minutes	45 Minutes	2 Formative
	2	End Module Examination	Formative	30 Minutes		
	TID. 4	(MCQs Based)		45 3 5		
	Total			45 Minutes		2 Assessments

Total Time of Clinical Component (Vertical and Horizontal Integration) Assessments for First Year MBBS:

Module	Formative Assessment Time	Total Assessments Time
Foundation Module	45 Minutes	45 Minutes
MSK-I Module	45 Minutes	45 Minutes
Block -I		
MSK-II Module	45 Minutes	45 Minutes
Blood & Immunity Module	45 Minutes	45 Minutes
Block -II		
CVS Module	45 Minutes	45 Minutes
Respiration Module	45 Minutes	45 Minutes
Block -III		
Pre-Annual Examination		35 Minutes
First Professional		60 Minutes
Grand Total	4 hours and 30 minutes	6 hours and 5 minutes

Total Teaching Hours vs Total Assessment Hours

	Grand Total Teaching Hours	Grand Total Assessment Hours
	97 Hours:	6 Hours
Ratio of Teaching Hours	19:1	
to Assessments Hours		

3.2.4 Pre- Annual Assessment (PAA)

- It is mandatory to appear in all EBA to appear in PAA
- Transcript / good character certificate from head of departments will be needed to appear in pre-annual assessment.

Proposed Table of Specifications for 1st Pre-Annual Examination 2024

• Total Marks: 845

Subjects	% Weightage of subjects	Marks distribution as per weightage
Anatomy	28%	240 Marks
Physiology	28%	240 Marks
Biochemistry	28%	240 Marks
Integrated Subjects Community Medicine & Public Health/Research Behavioural Sciences Pathology Pharmacology Radiology Family Medicine Surgery Medicine Gynae & Obs Orthopedics Pediatrics Surgery Opthalmology Otorhinolaryngology	14 %	115 Marks
Early Clinical Exposure (ECE)	1%	5 Marks
ALPHA(Artificial Intelligence, Leadership, Professionalism, Humanities & Arts) GEC (General Education Cluster)	1%	5 Marks
Total Marks	1	845 Marks

Notes:

- The total marks for final Annual Assessment (Professional examination) are 900 as per UHS
- The total marks for Pre-Annual Assessment are 800 as OSVE is not being used as assessment tool.
- As per analysis of Module/Block results throughout the academic year, the passing percentage of students is generally higher in OSVE than in other assessment tools. For comprehensive assessment this tool will not be used in Pre- Annual Assessment.as per decision of assessment committee OSVE is not included.

A - Blockwise Distribution of Marks

Total Marks	BLOCK I Marks	BLOCK II Marks	BLOCK III	Total Morks
	WIATKS	WIAFKS	Marks	Marks
845 Marks	285 Marks	285 Marks	275 Marks	845 Marks

B - Subject wise marks breakup in Blocks

Subjects	Block I	Block II	Block III	Total Marks
Anatomy	80 Marks	80 Marks	80 Marks	240 Marks (28%)
Physiology	80 Marks	80 Marks	80 Marks	240 Marks (28%)
Biochemistry	80 Marks	80 Marks	80 Marks	240 Marks (28%)
Integrated Subjects	45 Marks	45 Marks	35 Marks	125 Marks (16%)

C - Subject wise Break up of Marks for First year MBBS - Block -I

Block	Subjects	Theory (Knowledge)	Practical (Skill/attitude)	Total marks	Total marks (Core subjects + Integrated Subjects)
Block I	Anatomy	50	30	80 marks	
	Physiology	50	30	80 marks	
	Biochemistry	50	30	80 marks	
	Total			240	
				marks	240+ 45 = 285
(Core	Integrated Subjects				240+43=283 marks
subjects +	Community Medicine	6 Marks			marks
Integrated	/Research			45 Marks	
Subjects)	Behavioural Sciences	3 Marks		43 Marks	
	Pathology	2 Marks			
	Pharmacology	3 Marks			

	Radiology	2 Marks			
285	Gynae & Obs	4 Marks			
Marks	Medicine	2 Marks			
	Family Medicine	2 Marks			
	Paediatrics	4 Marks			
	Surgery	2 Marks			
	ECE		5 Marks		
	ALPHA and GEC		5 Marks		
	Total		240+ 45 =	= 285 marks	
marks					

D - Subject wise Break up of Marks for First year MBBS - Block -II

Block	Subjects	Theory (Knowledge)	Practical (Skill/attitude)	Total marks	Total marks (Core subjects + Integrated Subjects)
	Anatomy	50	30	80	
				marks	
	Physiology	50	30	80	
Block II				marks	
DIOCK II	Biochemistry	50	30	80	
				marks	
(Core	Total			240	
subjects +				marks	
Integrated	Integrated Subjects				240+ 45 =
Subjects)	Community	4 Marks			240+ 43 = 285 marks
Subjects)	Medicine /Research				203 11141 KS
	Family Medicine	3 Marks			
	Orthopedics	3 Marks		45	
285	Radiology	3 Marks			
Marks	Medicine	3 Marks		Marks	
Marks	Gynae & Obs	3 Marks			
	Behavioural Sciences	4 Marks			
	Pathology	2 Marks			
	ECE		5 Marks		

	ALPHA and GEC	5 Marks	
Total		240 + 45 = 285 marks	
marks			

E - Subject wise Break up of Marks for First year MBBS - Block -III

Block	Subjects	Theory (Knowledge)	Practical (Skill/attitude)	Total marks	Total marks (Core subjects + Integrated Subjects)	
	Anatomy	50	30	80		
				marks	-	
	Physiology	50	30	80		
Block III			20	marks	-	
DIOCK III	Biochemistry	50	30	80		
				marks	-	
	Total			240		
Total	T			marks	-	
marks	Integrated Subjects	2.16.1				
(Core	Community Medicine	2 Marks				
subjects +	Behavioural Sciences	2Marks			240+35 =	
Integrated	Medicine	3 Marks			275 marks	
Subjects)	Family medicine	3 Marks				
a a grada y	Gynae & Obs	2 Marks				
	Radiology	2 Marks		35		
	Pediatrics	2 Marks		Marks		
275	Otorhinolaryngology	3 Marks				
Marks	Opthalmology	2 Marks				
	Pathology	2Marks				
	Pharmacology	2 Marks				
	ECE		5 Marks			
	ALPHA and GEC	5 Marks				
	Total marks					
GRAND T	OTAL MARKS	800				

F - Modular distribution of Marks for Module 1(Foundation Module) & Module 2(MSK-I Module) - Block -I Block -I Theory Component (Knowledge)

		MCQs			EMQ			SAQ	•		SEQ		Total
Subjects	Module	Module-	Marks	marks									
	-1	2		-1	2		-1	2		-1	2		
Anatomy	13	12	25	-	01	5	01	01	10	0.5	0.5	10	50
Physiology	12	13	25		01	5	01	01	10		01	10	50
Biochemistry	15	10	25	-	01	5	01	01	10	01	-	10	50
Vertically &													
Spirally			35	-		-	-		-	-		-	35
Integrated													
Subjects													
Total	110		110	3		15	6		30	3		30	185

Block -I Practical Component (Skill & Attitude)

	Lab OSPE	1		Iospe	•		OSCE			T ()	Total
Subjects	Number of Stations of Module - 1	Number of Stations of Module - 2	Marks	Number of Stations of Module - 1	Number of Stations of Module - 2	Marks	Number of Stations of Module -1	Number of Stations of Module -2	Marks	Total stations	marks
Anatomy	01	02	15	01		5	01	01	10	6	30
Physiology	01	02	15		01	5	01	01	10	6	30
Biochemistry	01	02	15	-	01	5	01	01	10	6	30
ECE	-		-	-		-		01	5	1	5
ALPHA- Research	-		-	-		-		01	5	1	5
Total	9	_	45	3		15	8		40	20	100

G- Modular distribution of Marks for Module 3 (MSK-II Module) & Module 4(Blood & Immunity module) - Block -II

Block -II Theory Component (Knowledge)

	MCQs					•	SAQ			SEQ			Total
Subjects	Module	Module-	Marks	marks									
	-1	2		-1	2		-1	2		-1	2		
Anatomy	12	13	25		01	5	01	01	10	0.5	0.5	10	50
Physiology	12	13	25		01	5	01	01	10		01	10	50
Biochemistry	10	15	25		01	5	01	01	10		01	10	50
Vertically &													
Spirally			35	-		-	-		-	-		-	35
Integrated													
Subjects													
Total	110		110	3		15	6		30	3		30	185

Block -II Practical Component (Skill & Attitude)

a.1.	LabOSPE	LabOSPE			•		OSCE				Total
Subjects	Number of Stations of Module - 1	Number of Stations of Module - 2	Marks	Number of Stations of Module - 1	Number of Stations of Module - 2	Marks	Number of Stations of Module -1	Number of Stations of Module -2	Marks	Total stations	marks
Anatomy	02	01	15	-	01	5	01	01	10	6	30
Physiology	01	02	15		01	5	01	01	10	6	30
Biochemistry	01	02	15	01	-	5	01	01	10	6	30
ECE	-		-	-		-		01	5	1	5
ALPHA- Research	-		-	-		-		01	5	1	5
Total	9		45	3		15	8		40	20	100

H - Modular distribution of Marks for Module 5 (CVS Module) & Module 6 (Respiration module) - Block -III

Block -III Theory Component (Knowledge)

	MCQs			EMQ			SAQ			SEQ			Total
Subjects	Module	Module-	Marks	marks									
	-1	2		-1	2		-1	2		-1	2		
Anatomy	13	12	25	01	-	5	01	01	10	0.5	0.5	10	50
Physiology	13	12	25	01		5	01	01	10	01		10	50
Biochemistry	13	12	25	01	-	5	01	01	10	01	-	10	50
Vertically &													
Spirally			25	-		-	-		-	-		-	25
Integrated													
Subjects													
Total	100)	100	3		15	6		30	3		30	175

Block -III Practical Component (Skill & Attitude)

~	LabOSPE	LabOSPE			•		OSCE				Total
Subjects	Number of Stations of Module - 1	Number of Stations of Module - 2	Marks	Number of Stations of Module - 1	Number of Stations of Module - 2	Marks	Number of Stations of Module -1	Number of Stations of Module -2	Marks	Total stations	marks
Anatomy	02	01	15	-	01	5	01	01	10	6	30
Physiology	02	01	15	01	-	5	01	01	10	6	30
Biochemistry	02	01	15	-	01	5	01	01	10	6	30
ECE	-		-	-		-		01	5	1	5
ALPHA- Research	-		-	-		-		01	5	1	5
Total	9		45	3		15	8		40	20	100

Calculation for Pre-Annual Assessment Implementation for First Year MBBS 2024

Block -I	Theory com	ponent (Know	ledge)		Practical com	ponent (Skill	& Attitude)				
	MCQs	SAQs	SEQs	EMQs	Lab OSPE	I OSPE	OSCE	Total time required for Block – I pre annual assessment is			
Total number of	110	6	3	3	9	3	8	8 hrs and 25 minutes			
questions											
Time required for	110 x 1	6 x 10 min	3 x 10 min	3 x 5 min	9 x2.5 min	3 x 2.5 min	8 x 2.5 min				
each component	min										
	110 mins	60 mins	30 mins	25 mins	22.5 mins	7.5 mins	20 mins				
Total time	110+60+30+	-25 = 225 min	s (4hrs and 25	mins)	22.5+7.5+20	0 = 50 mins/ rc	ound of 20 stud	dents 4 hrs			
					If the OSPE is conducted simultaneously at 4 venues:						
					In 50 minutes, 20 students can complete the OSPE at each venue, totaling 80 students across all venues.						
					With 5 rounds at 4 venues, the entire class can complete the OSPE within 4 hours.						

Block -II	Theory comp	ponent (Know	ledge)		Practical com	ponent (Skill	& Attitude)				
	MCQs	SAQs	SEQs	EMQs	Lab OSPE	I OSPE	OSCE	Total time required for Block – II pre annual assessment is			
Total number of	110	6	3	3	9	3	8	8 hrs and 25 minutes			
questions											
Time required for	110 x 1	6 x 10 min	3 x 10 min	3 x 5 min	9 x2.5 min	3 x 2.5 min	8 x 2.5 min				
each component	min										
	110 mins	60 mins	30 mins	25 mins	22.5 mins	7.5 mins	20 mins				
Total time	110+60+30+	-25 = 225 mins	s (4hrs and 25	mins)	22.5+7.5+20	0 = 50 mins/ ro	und of 20 stud	dents 4 hrs			
					If the OSPE is conducted simultaneously at 4 venues:						
					In 50 minutes, 20 students can complete the OSPE at each venue, totaling 80 students across all venues.						
					With 5 rounds at 4 venues, the entire class can complete the OSPE within 4 hours.						

Block -III	Theory com	iponent (Know	ledge)		Practical con	nponent (Skill	& Attitude)				
	MCQs	SAQs	SEQs	EMQs	Lab OSPE	I OSPE	OSCE	Total time required for Block – III pre annual assessment is			
Total number of questions	100	6	3	3	9	3	8	8 hrs and 15 minutes			
Time required for	100 x 1	6 x 10 min	3 x 10 min	3 x 5 min	9 x2.5 min	3 x 2.5 min	8 x 2.5 min				
each component	min										
	100 mins	60 mins	30 mins	25 mins	22.5 mins	7.5 mins	20 mins				
Total time	100+60+30	+25 = 225 min	s (4hrs and 15	mins)	22.5+7.5+20	0 = 50 mins/ ro	und of 20 stud	dents 4 hrs			
					If the OSPE is conducted simultaneously at 4 venues:						
					In 50 minutes, 20 students can complete the OSPE at each venue, totaling 80 students across all venues.						
					With 5 rounds at 4 venues, the entire class can complete the OSPE within 4 hours.						

3.2.5 Annual Professional Assessment (APA)

- Minimum 50% score in pre-annual assessment is required to appear in annual professional examination.
- Annual professional exam weightage will be 70%
- Continuous internal assessment weightage will be 30%
- 60% marks will be needed to pass annual professional examination.
- Written and practical /OSPE/OSCE should be passed separately.

Regulations

- Final Annual Assessment shall be open to any student who:
 - o Has been enrolled/registered and completed one academic year preceding the concerned Final Annual Assessment in Rawalpindi Medical University.
 - Has his/her name submitted to the Controller of Examinations for assessment purposes by the Principal of the College and meets all prerequisites for the assessment.
 - o Has his/her internal assessment marks for all Blocks submitted to the Controller of Examinations by the Principal of the College along with the admission form.
 - o Produces good character certificate the following certificates duly verified by the Principal:
- Candidates not meeting the above requirements shall not be allowed to appear in the Final Annual Assessment but may sit for the supplementary examination if they fulfill all remaining requirements and stay enrolled as regular students up to the next examination.
- To pass the Final Annual Assessment, students must achieve at least 50% in both the Written and Oral/Practical/Clinical assessments, as well as a 50% aggregate score simultaneously.
- Candidates scoring 85% or above in any paper will be awarded a "distinction" in that Block, provided they achieve at least 80% in the Written component. Candidates must pass all papers in the Final Annual Assessment concurrently to receive any distinctions.
- A candidate who fails one or more papers in the Final Annual Assessment may temporarily join the next professional class until the supplementary examination but will not be promoted permanently without passing all papers.
- Students taking the supplementary examination for the first time due to an absence in the annual examination, if failing any paper, will be retained in their current class.
- Any student failing to clear the First or Second Final Annual Assessment MBBS within four attempts will be ineligible to continue or reapply for MBBS or BDS admission.
- Examination applications must be submitted to the Controller of Examination via the College Principal, with the required fee and documentation.

- College must submit question papers, internal assessment marks, and attendance records for each block to the Examinations Department of Rawalpindi Medical University.
- Revised internal assessments are only permissible for detained students. Continuous assessment records must be maintained by college departments.
- Examination fees are to be paid through the Principal, using a bank draft, pay order, or crossed cheque made out to the Treasurer, Rawalpindi Medical University.
- One annual and one supplementary examination for First and Second Final Annual Assessment MBBS are allowed per academic session. Under exceptional circumstances, such as national emergencies, a special examination may be arranged with the Syndicate and Board of Governors' approval.

Reference: UHS INTEGRATED CURRICULUM VERSION 2

Statutes:

- Scheduling: The First Professional MBBS will be held at the end of First year whereas the Second Professional MBBS shall be held at the end of Second year.
- Subjects: Every candidate is required to appear in the following subjects in each Block
 - a. Core subjects- Integrated Anatomy, Integrated Physiology, Integrated Biochemistry
 - b. Vertically integrated Subjects- Community Medicine C Public Health,

Behavioral Sciences, Pathology, Pharmacology, associated Clinical Subjects

- c. **Spirally Integrated subjects-** General Education Cluster (GEC), ALPHA (Artificial Intelligence, Leadership, Professionalism, Humanities and Arts), Early Clinical Exposure (ECE) and Research.
- Assessments: There will be three papers in First Annual Professional Examination and four papers in the Second Annual professional Examination.

Paper	First year MBBS	Second year MBBS
Paper-1	Block -I	Block -I
Paper-2	Block- II	Block- II
Paper-3	Block-III	Block-III
Paper-4		GEC (Islamic Studies C Pakistan
		Studies)

a. First Professional Examination Total Marks = G00*

- i. Block I Assessment Total Marks = 300
- ii. Block II Assessment Total Marks = 300
- iii. Block III Assessment Total Marks = 300

b. Second Professional Examination- 1000 Marks*

- i. Block I Assessment Total Marks = 300
- ii. Block II Assessment Total Marks = 300
- iii. Block III Assessment Total Marks = 300
- iv. GEC Assessment (Islamic Studies C Pakistan Studies) Total Marks = 100

*Marks Adopted from University of Health Sciences (UHS)

Reference: https://www.uhs.edu.pk/downloads/2k23mbbscurriculum.pdf

• Continuous Internal Assessment (CIA):

Continuous Internal Assessment shall carry total marks = 270 (30% of the total allocated marks = 900) for first and second year MBBS .CIA for each block is 90 marks and this score will be equally distributed to the written Assessment (45 marks) and practical assessment (45 marks).

- Block Assessment Components: the components of Block Assessment shall be as follows:
 - a. One theory Paper (K) having two sections
 - i. **Section:1** One best type Multiple choice questions of 75 Marks (1 mark for each MCQ) and time allocated will be 90 Minutes. The integration ratio in MCQs will be 70% core content, 10% horizontal integration, and 20% vertical integration. There will be no negative marking
 - ii. Section:2 will have Structured Essay Questions of 5 marks each and time allocated for 1 SEQ will be 10 minutes.

First year MBBS	Number of MCQs	Number of SEQs
Block -I	75	6
Block -II	75	6
Block -III	75	6
Second Year MBBS	Number of MCQs	Number of SEQs
Block -I	70	7
Block -II	75	6
Block -III	80	5

- b. **Practical Component (Skill and Attitude):** The assessment will include an Objective Structured Practical Examination (OSPE) with a total of 15 stations, time allocated for each station will be 4 minutes.
- i. Laboratory OSPE (Lab OSPE): This section will consist of stations focused on practical (hands on performance) components from core subject areas, each station carries 5 marks.
- ii. Integrated OSPE (I OSPE): This section will include stations, from each core subject, emphasizing horizontal and vertical integration, each station carries 5 marks
- i. **Objective Structured Clinical Examinations (OSCE):** This section comprises of stations, dedicated to Early Clinical Exposure (ECE), Simulated Patients (SP), models, ALPHA and clinical component of core subjects each station carries 5 marks.
- ii. **Objective Structured Viva Examinations (OSVE):** This section will consist of table viva for each core subject. Students will be evaluated by internal and external examiner using a structured marking rubric, with each viva carries 15 marks.

First year MBBS	Number of	Number of iOSPE	Number of OSCE	Numbe r of
	LabOSPE Stations	Stations	Stations	table VIVA
Block -I	5	3	4	3
Block -II	5	3	4	3
Block -III	4	3	5	3
Second	Number	Number	Number	Numbe
Year	of	of iOSPE	of OSCE	r of
	-	or root L	OI OBCE	1 01
MBBS	LabOSPE	Stations	Stations	table
MBBS	LabOSPE Stations			
MBBS Block -I				table
	Stations	Stations	Stations	table VIVA

- Annual Examination Eligibility Criteria: Eligibility to appear in Annual Professional will be as per RMU Assessment Policy approved by the Academic Council and Syndicate.
- Passing Criteria: A student will be declared pass in a block assessment if he/she scores 50% and above marks in each block assessment component (Theory and Practical) and 50% and above marks in each Core Subject(Anatomy, Physiology C Biochemistry).
 - Supplementary Examination Criteria: The student who fails in any component of a block assessment will have to appear in the supplementary examination of the entire block.

Table of Abbreviation

CIA	Continuous Internal Assessment
I-OSPE	Integrated OSPE
LabOSPE	Laboratory Objective Structured Practical Examination
OSCE	Objective Structured Clinical Examinations
OSVE	Objective Structured Viva Examinations
ECE	Early Clinical Exposure
ALPHA	(Artificial Intelligence, Leadership, Professionalism, Humanities C Arts
GEC	General Education Cluster
K	Knowledge

Annual Assessment Plan of First Year MBBS 2024 (Batch 51)

- Total First Professional Marks: 900
- Continuous Internal Assessment (30%) =270 Marks
- Annual Marks: (70%) =630 Marks

A: Original Distribution of CIA (Continuous Internal Assessment) Marks (270 Marks)

Blocks	Subjects	Total marks	Module 1	Module 2	Total marks
	Anatomy	30 marks	15 marks	15 marks	
Block 1	Physiology	30 marks	15 marks	15 marks	90 Marks
90 Marks	Biochemistry	30 marks	15 marks	15 marks	
	Anatomy	30 marks	15 marks	15 marks	
Block 2	Physiology	30 marks	15 marks	15 marks	90 Marks
90 Marks	Biochemistry	30 marks	15 marks	15 marks	
	Anatomy	30 marks	15 marks	15 marks	
Block 3 90 Marks	Physiology	30 marks	15 marks	15 marks	90 Marks
	Biochemistry	30 marks	15 marks	15 marks	
	I	1	1	Total marks	270 Marks

B: Extrapolated marks to be calculated from Summative assessments throughout the Academic Year 2024

Blocks	Modules	Anatomy	Physiology	Biochemistry	Total
DI II	Module 1	200	200	200	600
Block 1	Module 2	200	200	200	600
1470 Marks	Block Exam	90	90	90	270
	Total	490	490	490	1470
D1 1 0	Module 1	200	200	200	600
Block 2	Module 2	200	200	200	600
1470 Marks	Block Exam	90	90	90	270
	Total	490	490	490	1470
D1 1 0	Module 1	200	200	200	600
Block 3	Module 2	200	200	200	600
1470 Marks	Block Exam	90	90	90	270
	Total	490	490	490	1470
Total Marks	1	1470	1470	1470	4410

Note:

- Total Operational marks =4410 converted to 270 marks and per block 1470 marks will be converted to 90 marks for Annual professional marks calculation.
- The CIA should be submitted to Examination cell in round off values.
- Evidence of CIA Marks along with papers should be retained in the department that can be reproduced on request by examination cell if required.

Reference: https://www.uhs.edu.pk/downloads/2k23mbbscurriculumv20.pdf

Annual First professional Examinations 2024

- Total First Professional Marks: 900
- Continuous Internal Assessment (30%) =270 Marks
- Annual Marks: (70%) =630 Marks

A: First Professional Examination (70%)

A: First Professional Examination (70%) Total marks = 630 Marks							
Subjects	% Weightage of subjects	Marks distribution as per weightage					
Anatomy	35%	218 Marks					
Physiology	30%	192 Marks					
Biochemistry	23%	137 Marks					
Integrated Subjects							
 Community Medicine C Public Health/Research Behavioural Sciences Pathology Pharmacology Radiology Family Medicine Surgery Medicine Gynae C Obs Orthopedics Pediatrics Surgery Opthalmology Otorhinolaryngology 	11%	73 Marks					
 Early Clinical Exposure ALPHA and General Education Cluster (GEC) 	2%	10 Marks					
	Total Marks	630 Marks					

B: Blockwise Distribution of Marks

Total	BLOCK 1	BLOCK 2	BLOCK 3	Total
Annual	Marks	Marks	Marks	Marks
Professional				
Marks (70%)				
630 Marks	210 Marks	210 Marks	210 Marks	630 Marks

• Reference: https://www.uhs.edu.pk/downloads/2k23mbbscurriculumv20.pdf

C: Subject Wise Marks Breakup In Blocks

Subjects	Block 1	Block 2	Block 3	Total
				Marks
Anatomy	85 Marks	78 Marks	55 Marks	218 Marks (35%)
Physiology	45 Marks	64 Marks	83 Marks	192 Marks (30%)
Biochemistry	53 Marks	39 Marks	45 Marks	137 Marks (23%)
Integrated Subjects	27 Marks	29 Marks	27 Marks	83 Marks (13%)

D: Subject Wise Distribution of Marks for First Year MBBS

Block	Subjects	Theory	Practical	Total marks	Total marks Core Subject + Integrated Subjects
	Anatomy	45 marks	40 marks	85 marks	
	Physiology	20 marks	25 marks	45 marks]
	Biochemistry	23 marks	30 marks	53 marks	
	Total	88	95	183 marks	
	Integrated Subjects				
D	 Communit 	4 Marks			
Block 1	y Medicine				
	/Research				
	 Behavioural 	2 Marks			
	Sciences				183+27 =
	 Pathology 	2 Marks		-	210 marks
	 Pharmacology 	3 Marks			
	 Radiology 	1 Marks		27 Marks	
	Gynae C Obs	1 Marks			
	Medicine	1 Marks			
210 Marks	Family Medicine	1 Marks			
	Paediatrics	1 Marks			
	• Surgery	1 Marks			
	• ECE		5 Marks	1	
	ALPHA and GEC		5 Marks]	
	Total marks		183+2	27 = 210 marks	

Block	Subjects	Theory	Practical	Total marks	Total marks Core Subject + Integrated Subjects
	Anatomy	38 marks	40 marks	78 marks	
	Physiology	34 marks	30 marks	64 marks	
Block 2	Biochemistry	14 marks	25 marks	39 marks	
DIOCK 2	Total	86	95	181 Marks	181+29 =
	Integrated Subjects				210 marks
	• Communit	4 Marks]	
	y Medicine				
	/Research				

	Family Medicine	1 Marks	29 Marks
	 Orthopedics 	2 Marks	
210 Marks	 Radiology 	2 Marks	
	Medicine	3 Marks	

	•	•			
	Gynae C Obs	l Marks			
		4 Marks			
	Sciences				
		2 Marks			
	• ECE		5 Marks		
	ALPHA and		5 Marks		
	GEC		101 . 20	210	
	Total marks	T	181+29	= 210 marks	W 4 1 1
Block	Subjects	Theory	Practical	Total marks	Total marks Core Subject + Integrated Subjects
	Anatomy	25 marks	30 marks	55 marks	
	Physiology	48 marks	35 marks	83 marks	
	Biochemistry	15 marks	30 marks	45 marks	
	Total	88	95	183 marks	
	Integrated Subjects				
	 Community 	3 Marks			
Block 3	Medicine				
	• Behavioural	2 Marks			
	Sciences	236.1		4	
	Medicine	2 Marks			183+27 =
	Family medicine	1 Marks			210 marks
	Gynae C Obs	1 Marks		_	
	Radiology	1 Marks		27 Marks	
	Pediatrics	1 Marks		_	
210 Marks	Otorhinolaryngology	1 Marks		_	
	Opthalmology Dethalmology			4	
	Pathology Pharmaceleans	2 Marks 2 Marks		_	
	Pharmacology ECE	2 IVIATKS	5 Marks	4	
-	ECE ALDUA and CEC			4	
	ALPHA and GEC Total marks		5 Marks	27 210 1	
CDANDEO	Total marks		183+	$\frac{.27 = 210 \text{ mark}}{}$	
GRAND TO	OTAL MARKS			630	Marks

E: Block Wise Distribution Of Marks For First Year MBBS (Batch 51) (Annual Professional Marks + CIA)

Subject	Theo	ory		Practical			Total Marks
D1 14	Component	No of Items	Marks	Component	No of Items	Marks	
Block 1 (Foundation s MSK-1)	Section I- MCQ	75	75	LabOSPE	5	25	210
Total Annual marks=210	Section II- SEQ		30	iOSPE	3	15	
		6		OSCE	4	20	
				OSVE	3	45	
CIA = 90 Marks	Continuous Internal Asse	ssment (30%)	45	Continuous In	nternal Assessment (30%)	45	90
Total Annual marks+ CIA =210+90= 300	Total Marks		150	Total Marks		150	300
D. 1.6	Section I-	75	75	LabOSPE	5	25	210
Block 2 (MSK-2 Blood and Immunity	MCQ		30	iOSPE	3	15	
	Section II-	6		OSCE	4	20	
Total Annual	SEQ			OSVE	3	45	
marks=210							
CIA = 90 Marks	Continuous Internal Asse	ssment (30%)	45	Continuous In	nternal Assessment (30%)	45	90
Total Annual marks+ CIA =210+90= 300	Total Marks		150	Total Marks		150	300
Block 3	Section I-	75	75	LabOSPE	4	20	210
(CVS Respiration)	MCQ		30	iOSPE	3	15	
Total Annual	Section II-	6		OSCE	5	25	
marks=210	SEQ			OSVE	3	45	
CIA = G0 Marks	Continuous Internal Asse	Continuous Internal Assessment (30%) 45 Continuous Interna		nternal Assessment (30%)	45	90	
Total Annual marks + CIA =210+G0= 300	Total Marks		150	Total Marks		150	300
					Grand Tota	l Marks	G00

F: 1st Professional Examination 2024 (Batch 51) Block 1 Assessment Breakup (Foundation s MSK-1 Modules)

		Theory				Practical (OSPE)			OSVE	Marks	%	Total M per sub			
Themes	Discipline	No of MCQ s (1 marks each)	No of SEQs (5 marks each)	Marks	%	No of Stations of LabOSPE (5 marks each)	No of Stations of iOSP E (5 marks each)	No of Stations of OSCE (5 marks each)	OSVE (15 Marks)			Marks	%		
Cores Horizontally Integrated Subjects	Anatomy C Applied /Clinical	30	3	45	30	3	1	1	1	40	32	85	40		
	Physiology C Applied/Clinical	10	2	20	26	1	1	-	1	25	29	45	21		
	Biochemistry C Applied/clinical	18	1	23	26	1	1	1	1	30	29	53	25		
Vertically Integrated	Communit y Medicine C Public Health/Research	4	-	3	4	-	-	-	-	-	-	4			
	Behavioural Sciences	2	-	1	2	-	-	-	-	-	1	2			
	Pathology	2	-	2	2	-	-	-	-	-	-	2			
Subjects	Radiology	1		1								1			
Subjects	Gynae C Obs	1		1								1	14		
	Medicine	1		1								1	1		
	Family Medicine	1		1								1			
	Paediatrics	1		1			_		_			1			
	Surgery	1		1								1			
	Pharmacology	3	-	3	3	_	-		-	-	-	3			
Spirally Integrated	ECE	-	-	-		-	-	1	-	5	5	5			
Subjects	ALPHA and GEC	ı	_	-			-	1	-	5	5	5			
Total		75	6x5=30	105	100	5x5=25	3x5=15	4x5=20	3x15=45	105	100	210	100		
Total			105			105						105+105=210			

G: 1st Professional Examination 2024 (Batch 51)

Block 2 Assessment

MSK-2 s Blood/Immunity Modules

		Theory			Practical			OSVE		Total Marks per subject		
Theme	Subject	No of MCQ s (1 marks each)	No of SEQs (5 marks each)	Marks	No of Stations of LabOSPE (5 marks each)	No of Stations of iOSPE (5 marks each)	No of Stations of OSCE (5 marks each)	OSVE (15 Marks)	Marks	Total Marks	%	
Core's Horizontally Integrated Subjects	Anatomy C Applied / Clinical	23	3	38	3	1	1	1	40	78	37	
	Physiology C Applied/Clinical	24	2	29	1	1	1	1	30	64	30	
	Biochemistry C Applied/clinical	9	1	14	1	1	-	1	25	39	18	
	Community Medicine C Public Health	4	-	4	-	-	-	-	-	4		
	Behavioural Sciences	4	-	4	-	-	-	-	-	4		
Vertically Integrated	Pathology	2	-	2	-	-	-	_	-	2		
Subjects	Family Medicine	1								1	15	
	Orthopedics	2								2		
	Radiology	2								2		
	Medicine	3								3		
	Gynae C Obs	1								1		
Spirally Integrated Subjects	ECE	-	-	-	-	-	1	_	5	5		
	ALPHA and GEC	-	-	-	-	-	1	-	5	5		
Total Total		75	6x5=30 105	105	5x5=25	3x5=15	4x5=20	3x15=45	105	210	100	
Total			102		105					105+105=210		

H: 1st Professional Examination 2024 (Batch 51) Block 3 Assessment CVS Respiratory Modules

		Theory			Practical			OSVE		Total Marks per subject	
Themes	Discipline	No of MC Qs (1 marks each)	No of SEQs (5 mark s each)	Marks	No of Stations of LabOSPE (5 marks each)	No of Station s of iOSPE (5 marks each)	No of Stations of OSCE (5 marks each)	OSV E (15 Marks)	Marks	Marks	%
	Anatomy C Applied /Clinical	15	2	25	1	1	1	1	30	55	26
Cores Horizontally Integrated Subjects	Physiology C Applied/Clinical	33	3	48	2	1	1	1	35	83	40
	Biochemistry C Applied/clinical	10	1	15	1	1	1	1	30	45	21
	Community Medicine C Public Health	2	-	2	-	-	-	-	-	2	-
	Behavioural Sciences	2	-	2	-	-	-	-	-	2	
	Pathology	2	-	2	-	-	-	-	-	2	
	Medicine	2		2						2	
Vertically Integrated	Family medicine	1		1						1	
Subjects	Gynae C Obs	1		1						1	
~ g	Radiology	1		1						1	
	Pediatrics	1		1						1	12
	Otorhinolaryngology	1		1						1	13
	Opthalmology	1		1						1	
	Pathology	2		2						2	1
	Pharmacology	1	-	1	-	-	-	-		1	
Spirally Integrated	ECE	-	-	-	-	-	1	-	5	5	
Subjects	ALPHA and GEC	-	-	-	-	-	1	-	5	5	
Total	ı	75	6x5=30	105	4x5=20	3x5=15	5x5=25 105	3x15=45	105	210	100
Total		105					-		105+105=210		

Section-XIII

Digital Literacy &

&
Learning Resources



Digital Services and Resources

A Data Center is the main central hub of digital services and resources of Rawalpindi Medical University.

Following are the digital resources to enhance the educational and research capabilities of students, researchers, and faculty.

1. Pakistan Education and Research Network (PERN)

Pakistan education and research network initiated by the Government of Pakistan under the administration of HEC. The main objective of PERN is to support and enhance the research and educational capabilities of public sector universities. PERN provides the following research and educational facilities.

- High-speed internet bandwidth.
- Intranet Bandwidth.
- Research Bandwidth Connectivity to the following research networks.
 - 1. National Research and Education Network (NREN) Global research network.
 - 2. Trans Eurasia Information Network (TEIN),
 - 3. China Education and Research Network (CERNET)
 - 4. GEANT is the pan-European data network for research
 - 5. Canadian Network for the Advancement of Research, Industry, and Education CANARIE (Canada)

Leveraging the strides in technological innovation, The Department of Information Technology has successfully rolled out a comprehensive Wi-Fi mesh network across its campus. This transformative step ensures seamless wireless connectivity both indoors and outdoors, significantly enhancing the digital experience for students, faculty, researchers, and staff members.

Embracing the cutting-edge wireless protocol 802.11n, this network empowers each Access Point to deliver an impressive bandwidth of up to 1000 Mbps to users.

In terms of infrastructure, the campus has been equipped with a total of 81 Access Points, strategically positioned across various locations including academic buildings, open spaces, and hostels. This comprehensive coverage ensures that users can seamlessly access the network regardless of their location on campus.

Users and Bandwidth Details								
Internet Bandwidth	230 Mbps							
Main Campus	160 Mbps							
New Teaching Block	70 Mbps							
PERN Bandwidth	120 Mbps							
Main Campus	100 Mbps							
New Teaching Block	20 Mbps							
PERN Users	1938							
Students	1385							
Faculty Members (RMU & Allied Hospitals)	360							
Management & Staff	78							
Technical	47							
Smart Classroom Users (Main Campus and NTB)	68							

2. Official / Institutional E-mail System

- Migration of unlicensed mailboxes to licensed mailboxes without any loss of data.
- Enhance the capacity of data storage in mailboxes 1 GB to 1 TB cloud storage per user.
- Increase the number of email accounts from 200 to 5500 licensed accounts with the facility of OneDrive and Microsoft Teams.
- 5000 Microsoft A3 activated license for faculty students and researchers.

Features:

Outlook (Email)

Teams (Meeting, Research Collaboration, Research Group)

Forms (Survey, Quiz, Polls, Reviews)

Office Applications (Word, Excel, PowerPoint)

3. Software Licensing

Rawalpindi Medical University has an engagement with Microsoft through HEC for volume licensing for their faculty students and researchers which includes Turnitin, Windows Server, One Drive, MS Office 365, and MS Teams.

Turnitin:

Turnitin (stylized as Turnitin) is an Internet-based plagiarism detection service.

- Unlimited license for faculty
- 300 licenses for students
- Faculty and students should have RMU's official e-mail address.
- Instructor can create a class and add students to a class for research purposes.
- Uphold academic integrity.
- Superpower your assessment
- Foster original thinking

Link: https://turnitin.com/













4. Smart Classroom (Main Campus and NTB)

The establishment of Smart Classroom setup can play a pivotal role to enhance students teachers interaction through interactive online & distance learning, bridge the gap of good faculty, meet the shortage of faculty members at the universities/ campuses located at far-flung areas and ultimately uplifting the standard of education across the board.

Rawalpindi Medical University established smart classrooms at the main campus and its branch site at NTB.

5. Campus Management System (CMS)

A Campus Management System (CMS) is in the implementation stage in the RMU. It will automate the different key processes of the university, from admission to examination.

Student Profiling and Registration

It includes student personal and educational information.

Sub Modules:

- a) Digital Admission Form with supporting documents.
- b) Verification by Student Section
- c) Registration & Issuance of Registration Cards.
- d) Timetable and Calendar View.
- e) E-card printing

Faculty Profiling

It includes faculty personnel, educational, research, and all relevant information.

Sub Modules:

- a) HR Section Verification
- b) Dashboard
 - i. My Profile View
 - ii. My Academic Sessions View
- c) Teacher's Attendance
- d) Student's Attendance

Academic Module

It includes all academic activities of an integrated modular system.

Smart Classroom Main Campus RMU



Smart Classroom New Teaching Block (NTB) RMU



CMS Time Table

modules/Sessions/Batches etc.
Faculty and Students are directly engaged with their profiles, Sessions, Timetables, and Academic Calander.
Sub Modules:

(DME)

creates

and

manages

Education

a) Configuration

Campuses/ Hospital

Departments

Venues

Department of

Batches

Programs

b) Academic

Module

Attendance

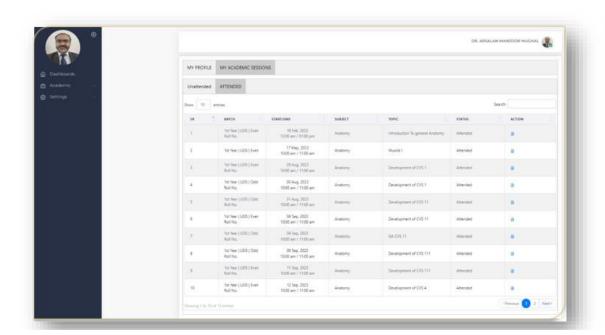
Schedules

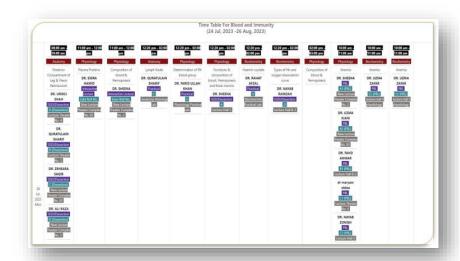
Event

Calendar A few screenshots are attached below as a reference.

Medical

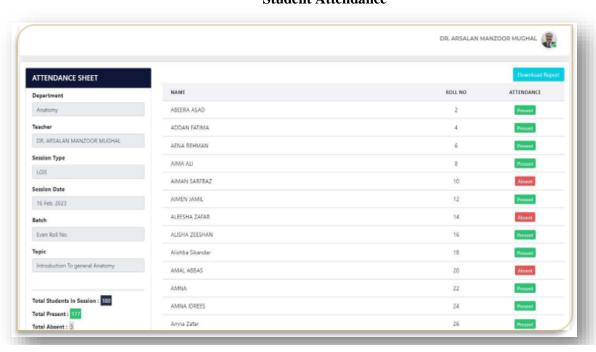
Teacher Attendance





Student Attendance

the



6. E-Log System for Postgraduate Residency Program

PGT Portal will provide users with faster and easier access to Logbook features while offering value-added content to increase session duration and reduce bounce rate. From here, the system's detailed objectives could include the following:

7. Digital Library

Provide access to online international scholarly literature for research purposes. It also provides access to high quality general articles and e-books through PERN.

RMU is now offering the HEC Digital Library facility to the faculty and students, as an on-campus facility.

The Digital Library is a collection of electronic resources that provides direct/indirect access to a systematically organized collection of digital objects.

HEC National Digital Library (DL) is a program to provide access to international scholarly e-literature.

Providing access to high-quality, peer-reviewed journals, databases, articles, and ebooks across a wide variety of disciplines to researchers within public and private universities in Pakistan and non-profit research and development organizations.

It provides 50,000 online full-text e-books in addition to more than 23,000 journals.

Institute For Operations Research And The Management Sciences (Informs)

Springerlink

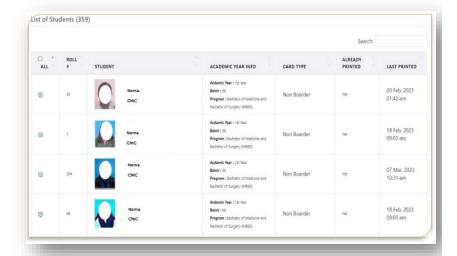
Taylor & Francis Journals

Wiley-Blackwell Journals

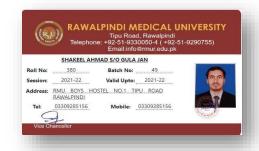
Wolters Kluwer Ovid Sp

Link: http://www.digitallibrary.edu.pk/rmc.html

Student Details



E-card Printing

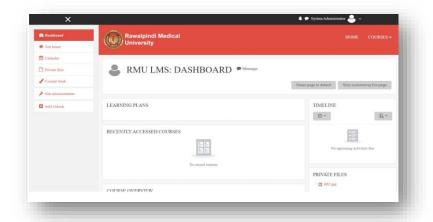


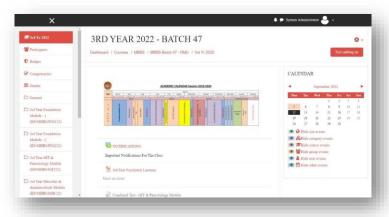
Digital Library



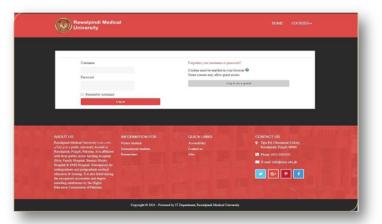
8. Content and Learning Management System (CLMS)

An online integrated software used for creating, delivering, tracking, scheduling, assessments, content uploading and reporting of educational courses. Link: https://clms.rmur.edu.pk/login/index.php









Users:	3830
Courses:	(Active 12)
Questions:	19542
Content Folders:	370
Books:	5
Attempted Quizzes and Results:	478
Files / Notes:	70
External Links:	25
Assignments:	35

Learning Resources

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

	Spiral Integration Subjects & General Education Cluster Courses			
Bioethics	Textbooks			
	1. Textbook of Medical Ethics by Erich H. Loewy (Author)			
Videography	The Five Cs of Cinematography by Joseph V. Mascelli			
	Digital Video Production: A Comprehensive Guide by Anirban Das			
Leadership	Leadership and the New Science by Margaret J. Wheatley			
	A Treatise on Good Works by Martin Luther			
Family Medicine	Textbooks			
	Textbook of Family Medicine" by Robert E. Rakel and David P. Rakel			
	Essentials of Family Medicine" by Philip D. Sloane, Lisa M. Slatt, and others			
	Textbook of Family Medicine" by Ian R. McWhinney			
	Family Medicine: Principles and Practice" by Robert B. Taylor			
Islamiat & Pak Studies	Islamiyat Lazmi by Muhammad Khalil			
	Vertical Integration Subjects			
Medicine	Textbooks			
	Harrison's Principles of Internal Medicine by J. Larry Jameson, Anthony S. Fauci, and others			
	Davidson's Principles and Practice of Medicine by Stuart H. Ralston, Ian D. Penman, and others			
Kumar and Clark's Clinical Medicine by Parveen Kumar and Michael Clark				
	Oxford Handbook of Clinical Medicine by Ian B. Wilkinson, Tim Raine, and others			
Surgery	Textbooks			
	1. Bailey & Love's Short Practice of Surgery by Norman S. Williams, P. Ronan O'Connell, and Andrew W. McCaskie			
Obsteterics & Gynecology	Textbooks			
	Obstetrics by Ten Teachers			
	Gynaecology by Ten Teachers			
Peadiatrics	Textbooks			
	1. Nelson Textbook of Pediatrics" by Robert M. Kliegman, Joseph St. Geme, and others			
	2. "Textbook of Pediatrics" by A. Parthasarathy			
	Digital Resources			
Up To Date	https://www.uptodate.com/contents/search			
RMU Digital library	http://www.digitallibrary.edu.pk/rmc.html			
	International Resources			
USMLE	https://www.usmle.org/			
Plab	https://www.gmc-uk.org/registration-and-licensing/join-the-register/plab			
U World	https://www.uworld.com/			
Kaplan	https://mykaplan.co.uk/			



Quality Assurance

&

Quality Enhancement



Feedback and Evaluation

Rawalpindi Medical University is dedicated to advancing equality, diversity, and inclusion across all its activities, processes, and cultural practices, in line with its Public Sector Equality Duties. This commitment encompasses promoting equality and diversity for everyone, regardless of any protected characteristic, working pattern, family circumstance, socio-economic background, political belief, or any other irrelevant distinction. Where pertinent to the policy, decision-making panels will ensure a reasonable gender balance (with at least one man and one woman) and will actively consider the representation of other protected groups.

Principles Feedback from students is essential to inform the development of the University's programmes and to help shape all aspects of their current and future learning and broader experience. The University actively seeks and encourages students to share their views. Our approach aims to create openness, responsiveness and a sense of partnership.

How feedback is received

> Informal Feedback

Informal feedback is received by day-to-day dialogue between students and staff,

> Formal Feedback

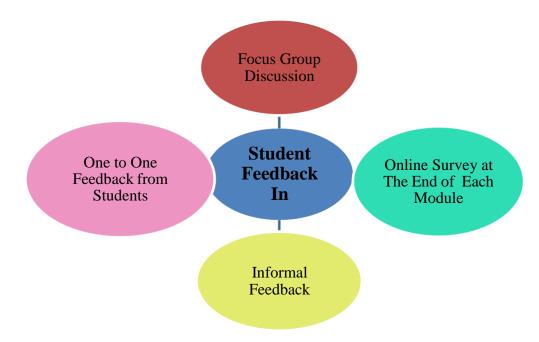
Feedback is received from students in more formal settings. These include:

• Central survey campaign

The University regularly invites students to participate in anonymous surveys (Appendix 1).

The central surveys take place after every module, after every Block and at the end of the academic year. This schedule enables the University to work in conjunction with the students and help to improve the teaching, learning and assessment methodologies.

- Focus Group Discussion
- One To One Feedback from Students



Student Feedback Proforma for 2024

(to be conducted after every module completion)

Module Content & Organization

Questionnaire	Strongly	Agree	Uncertain	Disagree	Strongly Disagree
	Agree				
The module objectives were informed.					
At the beginning of module study guide wasavailable.					
The module workload was manageable.					
The pace of the module was manageable.					
The module was well organized.					
Module started and ended on time.					
End of block feedback was taken					

Learning Environment and Teaching Methods

Questionnaire	Strongly	Agree	Uncertain	Disagree	Strongly Disagree
	Agree				
Lectures were delivered appropriately.					
Labs were conducted appropriately.					
Small group discussions were conducted appropriately					
Teaching sessions were as per schedule.					
CBLs were conducted appropriately					
Faculty was cooperative.					
Learning resources were communicated clearly					
SGDs were standardized between different batches					

Quality of Delivery

Questionnaire	Strongly Agree	Agree	Uncertain	Disagree	StronglyDisagree
The module stimulated my interest.					
Ideas were presented clearly.					

Learning Resources

Questionnaire	Strongly	Agree	Uncertain	Disagree	StronglyDisagree
	Agree				
Learning Material was provided /recommended.					
Learning Resources were available in the library.					
Digital / Web Based resources wereavailable.					
Power points of lectures were available					

Student Contribution

Questionnaire	Strongly Agree	Agree	Uncertain	Disagree	StronglyDisagree
I participated actively in the module.					
I believe I have made progress in thismodule.					

Assessments

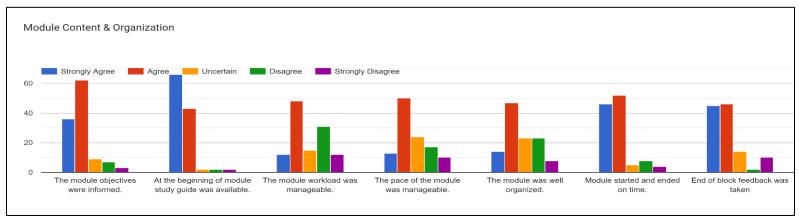
Questionnaire	Strongly Agree	Agree	Uncertain	Disagree	StronglyDisagree
Class tests were conducted regularly.					
Class tests were helpful					
Test difficulty was appropriate.					
Written Assessment was as per Table of Specifications.					

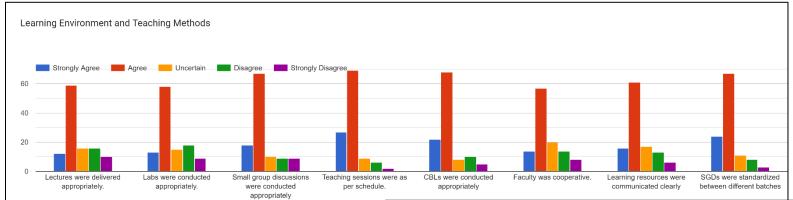
OSPE Exam was as per Table of Specification			
Table of Specification was shared			

LMS and its working

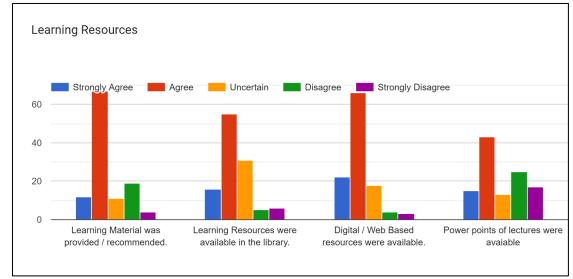
Questionnaire	Strongly	Agree	Uncertain	Disagree	Strongly
	Agree				Disagree
Easy Access to LMS					
Module Content was Available					

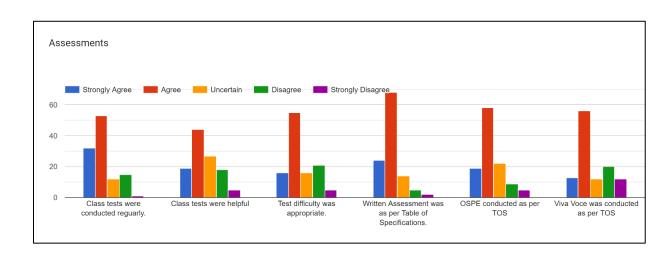
Student Feedback Report

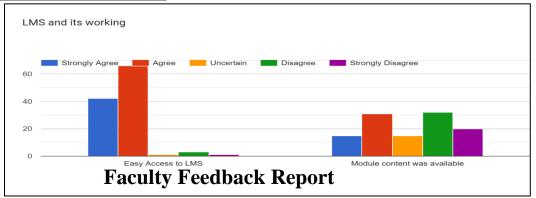


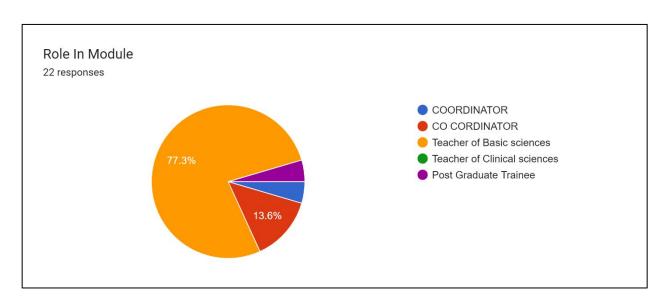


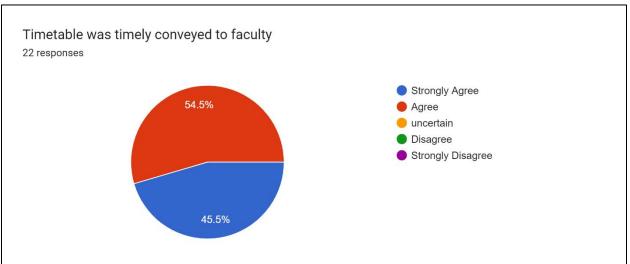
Student Contribution

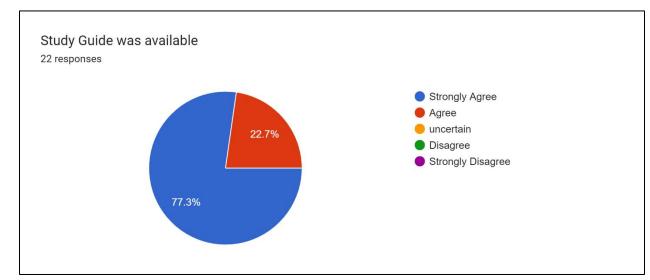


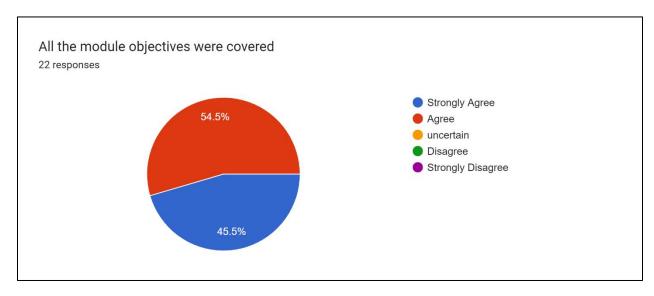






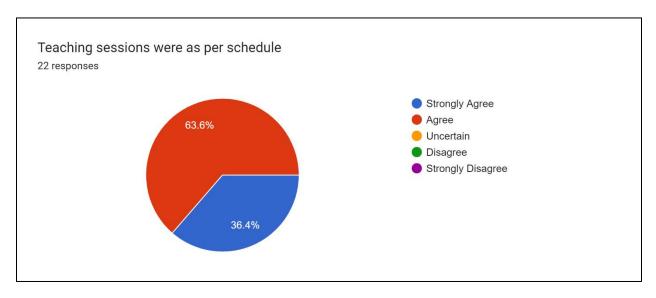


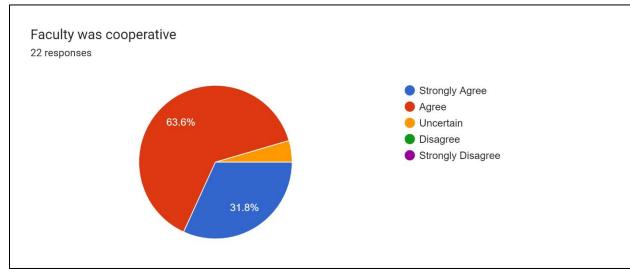


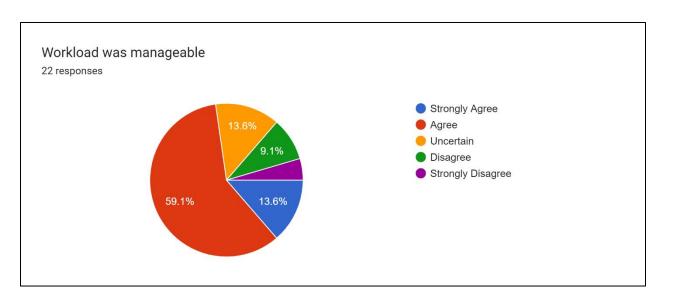


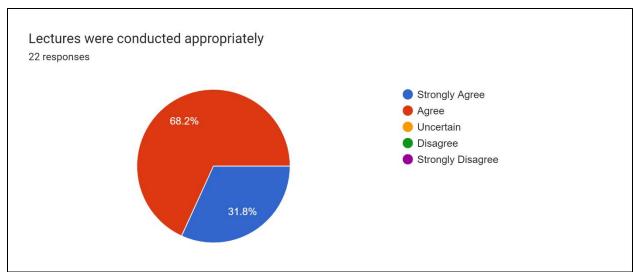


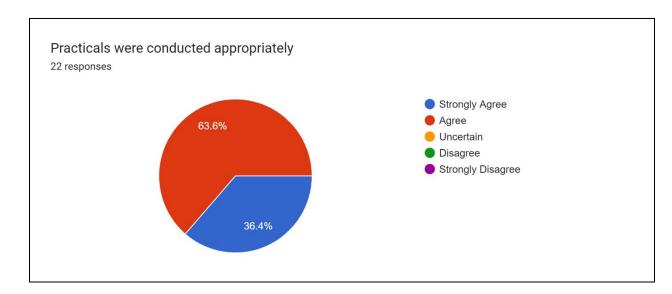


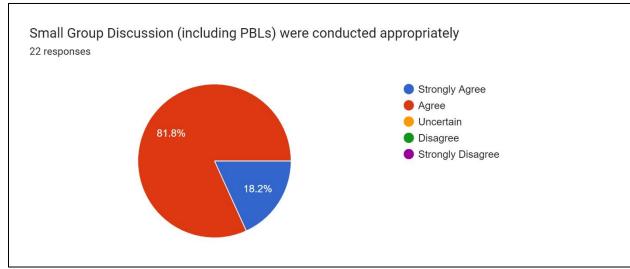


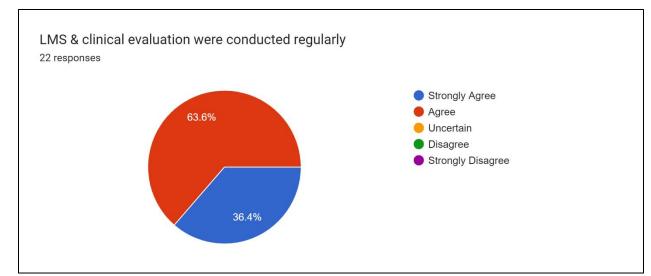


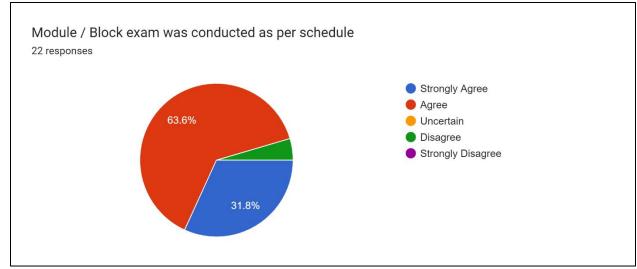


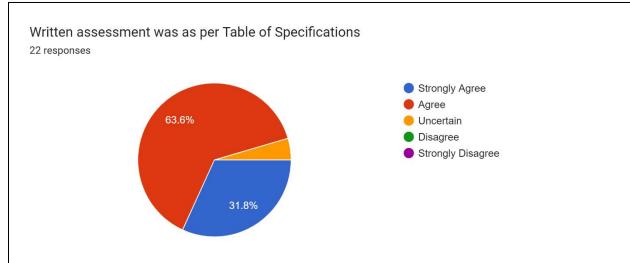


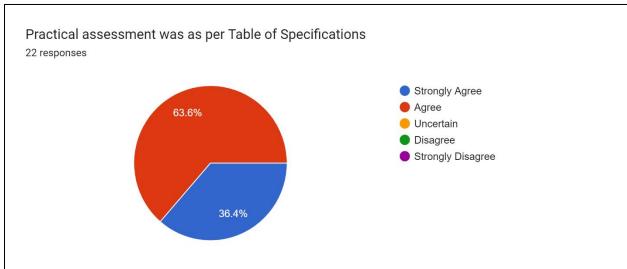


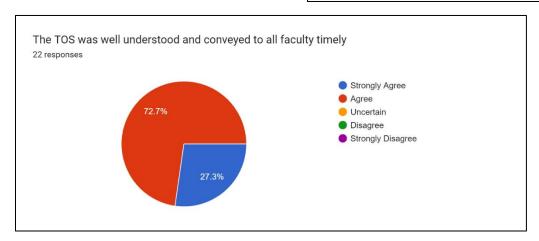












Swot Analysis of Curriculum

SOWT Analysis of Implementation of IMC

• Strength

- o We are leading all public sector medical colleges in implementation of integrated modular curriculum
- We are fulfilling the requirement of World Federation for Medical Education
- Our future doctor will be able to correlate and integrate basic and clinical knowledge in a better way with the competencies of 7 Star Doctor-acting as leader, manager, decision make, and communicator and care provider, decision maker, researcher and lifelong learner.

Opportunities

- o We have completed the phase –I of implementation for 1st, 2nd and 3rd year and we are now able to implement it in 4th and final year
- o We can further refine our integrated curriculum of 1st and 2nd year MBBS in coming years and can better tackle its flaws.
- o Proper committees for feedback and evaluation are developed with collaboration from QEC& DME.

Weaknesses

- o A change in system is always difficult to be accepted by stakeholders
- o Inflexible as compared to Conventional System.
- The content of different subjects is sometimes jumbled up in various modules according to the requirement of that specific module which is difficult to be absorbed by the students.

• Threats

o The Modular System can totally collapse back to Conventional System if not vigilantly and expertly handled.

Summary of Implementation Challenges of IMC

v 1	nementation Chancinges of Ivic
Deficiencies	Corrective Action/Solution
Integration is a difficult task (how & when to integrate)	Frequent meetings with faculty and students
100% Integration is NOT possible	Frequent meetings with faculty and students and do integration wherever possible, at present RMU is running the curriculum at 5 th level of integration of Harden's Ladder.
Lack of consensus among teachers while preparing curriculum	Faculty development workshops & CHPE to change the mind set of whole faculty.
Dissatisfaction among subject specialists about time & information allotted to them in the module(s)	Content taken from subject specialist with their consensus & approval
Lack of adequate weightage given to subjects in evaluation	Subject based assessments added in the modules.
Fragmented learning of subjects with fragmented assessment (subject is taught in parts in different years of the MBBS course.	Frequent subject specialists meetings
Too many modules may result in complex timetables amo	ong the classes (each class of
running their own modules)	

Recommendations

Mode of information transfer			
Increasing the human resources.		As per PMC criteria	
Student centered teaching		Training of teachers	
Use of flipped classroom technique to overcome anatomy excessive course.		As per PMC criteria Training of teachers the issue of	
CBL & PBL		36 CBLs & 3 PBLs have been added	
Learning And Teaching Environment			
Providing the resources conducive to learning &			
teaching.			
Spiral curriculum(anatomy to be incorporated in			
pathology and radiology lectures)			
Taking effective feedback from stake holders to Feedback taken at the end of each			
improve & implement the changes. module from students			
Assessment strategy:			
It is mandatory to pass in the individually rather than collectively.	subjects		
j j			

• Future Horizon

• We plan on taking the curriculum to excellence and improving the ladder of curriculum according to Harden's ladder of curriculum

Quality Enhancement Cell (QEC) Report Integrated Modular Curriculum MBBS & Department of Medical Education

Quality Enhancement Cell- RMU since its inception has been active in promoting its core function of bringing standardization to university's academic programs in line with the guidelines enunciated by the Higher Education Commission. In this regard, first thing on which QEC team focused was QEC guidelines. Team achieved that milestone in record time. Approved QEC guidelines of RMU were implemented in 2018. Quality Enhancement Cells serve as focal points for quality assurance in the institutions in order to improve and uphold the quality of higher education. Capacity building of academia in quality assurance is one of the key functions of Quality Assurance Agency (QAA), HEC and subsequently of QEC. Thus, QAA and QECs of the Universities work hand in hand to move in this direction of capacity building arrangements that include awareness campaigns, development of quality assurance policy instruments, training to learn the processes and procedures of quality assurance in higher education institutions and development of Manual to equip the practitioners of quality assurance. In recent years it has become an obligation that institutions of higher education demonstrate the effectiveness of their academic programs in providing high quality education that positively impacts students. Furthermore, most accrediting bodies and others concerned with quality assurance are requesting that institutions assess students learning outcomes as a means of improving academic programs. This has led the accrediting bodies to develop methods for assessing the quality of academic programs. So, whole conventional system was needed to be revamped. Rawalpindi Medical University has the honor of being the first public sector Medical University of Punjab which has introduced the modern modular system of medical education for the MBBS course. It was a big challenge for Department of Medical Education (DME) and Quality Enhancement Cell to maintain the quality and standards of all the teaching and training practices. Quality enhancement cell, RM

Following are the compliments and recommendations by the Quality Enhancement Cell, RMU:

Commendations:

- 1. Proper, well managed integrated modular curriculum is in place under the vibrant and energetic leadership of Vice Chancellor, Prof. Muhammad Umar and Department of Medical Education. This thing has also been acknowledged by different visits by accreditation bodies like Higher Education Commission (HEC) and Pakistan Medical & Dental Commission.
- 2. Proper curriculum committee is in place with appropriate representation of the students as members.
- 3. All stakeholders are on board and are on one page regarding implementation of the integrated modular curriculum.
- 4. Regular meetings have been done by the curriculum committee.
- 5. Feedback has been taken regularly with appropriate gap interval in between.
- 6. Proper record keeping has been done by the Department of Medical Education both in soft and hard form.
- 7. As far as the assessment is concerned, newly established Examination Department is doing commendable and admirable job.
- 8. Final results are indicating that both students and faculty has adapted well to integrated modular system and they are satisfied with the system.
- 9. Campus management system is working efficiently.
- 10. Standardized format of all teaching strategies has improved the quality of the deliverance of the subject matter.

Recommendations:

- 1. Communication and coordination among the departments can be made better. This will help in normalizing the pressure on the Department of Medical Education.
- 2. Department of Medical Education should be equipped with more human resource.
- 3. Faculty members should be provided with more opportunities for updating themselves with modern teaching methodologies. They should be encouraged to have certification or masters in medical education.
- 4. Departments and DME should ensure equal distribution of responsibilities among faculty members.
- 5. Steps should be taken in account for improving the ladder of the curriculum according to the Harden's ladder of curriculum.
- 6. Faculty should be encoouraged to participate actively in the Faculty Development Program of the university which is already working on a very good pace.
- 7. Subjects specialists are advised to have more frequent meetings with the aim of improving the quality of the content delivered to the students.
- 8. Student centered teaching should be encouraged more.
- 9. Any motivational lecture should be included in the time table for every class as it is very important for the students for personal growth and development.
- 10. The weightage of all clinical lectures should be increased in first and second year MBBS, as the attandance is on the lower side in clinical lectures of the above said years.

Dr. Rabbia Khalid Assistant Director Quality Enhancement Cell Rawalpindi Medical University Rawalpindi

Dated: 04-05-23